THE AMERICAN ARCHITECT AND BUILDING NEWS.

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ALTHOUGH no official report has been received from the Commission charged with the duty of inquiring into the cause of the catastrophe at Madison, Wisconsin, it is understood that the evidence points to defects in the iron columns as the primary source of weakness in the structure. Although sound in appearance when brought on the ground, the columns are said to have shown themselves, when fractured by the crash, full of air-bubbles and scoriæ, while the thickness proved to be much less than that called for in the specification. So far as the plans are concerned, the Commission finds nothing to criticise seriously, and will, it is said, exonerate the architects of all responsibility for the disaster, and will also, probably, relieve the builders from blame. For some reason, one or two of the journals which comment on the matter seem to think that if neither the architects nor the builders are to be made accountable for the consequences of the calamity the State will be forced to assume them. This idea appears to us quite erroneous. If the iron-founder who made the columns was a contractor with the State, or a sub-contractor under a principal contractor, and not employed by the State as its salaried agent, he is, if the fatal weakness is shown to have been in his work, accountable, to the last dollar of his property, for the reimbursement of the State's loss, and the payment of proper compensation to the families of the men who were killed or injured through his fault. If he was a principal contractor, he would be, as we suppose, alone responsible; but if, as we understand to have been the case, he was a sub-contractor only, we cannot see why his principal is not held equally with himself. Under the French law, if the fall of the building had been due to defects which could have been detected by the architect, the latter would be made jointly responsible with the man whose bad work he failed to condemn, although he would be regarded only as a secondary, not a principal offender, and the contractor's property would have to be first exhausted in paying compensation for the damage caused, before any demand could be made upon that of the architect. In such a case as this, however, it is very doubtful whether any tests within the reach of the architect would have shown the dangerous inferiority of the castings. The common method, of ringing the iron with a hammer, would show the existence of an indefinite number of air-bubbles, but the factor of safety usually allowed for cast-iron columns is so large that a small amount of imperfection might pass without making it necessary to reject the column, and the hammer test would not show the extent of the defect.

WE regret exceedingly to learn of the sudden death of a well-known and very highly esteemed architect of New York, Mr. Henry Fernbach, who, like the lamented Mr. Sims of Philadelphia, a year ago, while at work in his office suddenly fell, and expired in a few minutes. Mr. Fernbach was born in 1828 in Breslau, Germany, and graduated at the Building Academy in Berlin, coming to this country in 1855, immediately after his graduation. After some years spent as an assistant to various architects, he began business for himself, and gained very considerable distinction, being entrusted with the construction of the Germania Savings Bank, the *Staats-Zeitung* Building, the Hebrew Orphan Asylum in Seventy-seventh Street, and if we are not mistaken, of the beautiful synagogue in Fortieth Street. He was chosen early in his career a member of the American Institute of Architects, and took much pleasure in promoting its interests, as well as those of the Chapter to which he belonged. Although naturally of a rather quiet and retiring disposition, he was recognized in the profession as a thorough master of his art, and a friendly and trustworthy associate. The American Institute of Architects, in particular, which owes to him, and to the others like him, who formed its strength in its earlier days, that tradition of dignity and self-respect which has done so much for its influence, will place his name among those to be preserved in the most honored remembrance.

MOST architects, even in this country, are more or less familiar with the London *Builder*, and will be interested to learn of the retirement of its distinguished editor from the control of what has been for many years the most influential of the professional journals. Both as a writer on architectural matters, and as an architect, the retiring editor, Mr. George Godwin, has been prominently before the public, both in England and elsewhere, for fifty years. His first professional training was received in the office of his father, who was also an architect, and although taken early from school to devote himself to practical work, his untiring industry supplied the place of other teaching, and he soon became prominent among the students of his time. While still a pupil, his attention was attracted by the offer of a prize for the best essay on concrete, to be judged by a committee of the Royal Institute of British Architects, and he undertook a thorough study of the subject, collecting the information thus gained into an essay which not only won for him the first prize, but received the still greater honor of immediate translation and publication in France, Germany and Italy.

LIKE most people of active mind, he took pleasure in communicating his ideas to others, and his skill in writing increasing with practice, he was drawn into an amount of literary work which few members of the profession think of attempting. His devotion to art of other kinds remained, however, undiminished, and he was one of the most earnest promoters of the effort which resulted in the establishment of the Art-Union of London, acting as the Secretary of the association for many years, and devoting much of his time and means to its aid in the earlier and more precarious stages of its existence. During this period he was also constantly engaged in more strictly professional work, winning the first premium in the competition for the great Colney Hatch Lunatic Asylum, and constructing several important churches and schools, besides many private buildings. While still very young, his attention was drawn to the beauty and interest of many ancient ecclesiastical buildings in London, and he began the important work, which, published some years later under the name of the "Churches of London," is still a standard book of reference, and an admirable example of the way in which such subjects should be treated. In recognition of the merit of this and his other works, he was elected a Fellow of the Royal Society, and a Fellow of the Society of Antiquaries, as well as of the Royal Institute of British Architects, and a few months later the Société Libre des Beaux-Arts of Paris awarded him its gold medal. In 1844 he became the editor of the *Builder*, then just entering upon its third year, and for forty years conducted it with unvarying regard to the best interests of the profession of architecture and the allied arts, as well as with admirable intelligence and success. In the moments of leisure which his duties as editor of this journal left him, he still found time to design and execute many buildings, and among other commissions, was employed by the great actor, Kean, to prepare drawings for the scenery of the plays of "Macbeth," the "Winter's Tale," "Richard Third," and "Henry Eighth," which Kean desired to represent with all possible artistic advantages. Even these

occupations did not absorb all his attention, and he continued to publish at intervals essays and books upon professional topics; his graver thoughts recurring frequently to the sad theme of the distress and misery which afflict the poorer half of London. Upon this subject he wrote and studied much, with what practical earnestness those who remember the interest which the *Builder* has always shown in the improvement of dwellings for the working classes can understand. Judging from the lives of other men who have impressed themselves upon their time, it would hardly be surprising if the well-earned leisure of Mr. Godwin's later years, of which many, we hope, still remain to him, should be devoted to the most fruitful of all his efforts for the good of his fellow-men; if not, we may be certain that only physical infirmity has been able to overpower the zeal which his matured wisdom would have directed so effectively.

LA SEMAINE DES CONSTRUCTEURS gives its opinion in a recent number upon a question which will interest a great many people besides its own readers. A letter to the editor relates that the writer, a clerk in the office of his father, who is a mason and builder, was asked by a thrifty individual to make plans for a building which he thought of erecting. The clerk made the plans and took them to the proprietor, who found them satisfactory, and desired that specifications should be drawn up, and the whole submitted for estimate to such contractors as the clerk might select. This was done, but on comparing the estimates it was found that the total estimate exceeded the limit of cost which the proprietor had contemplated; and the plans were modified to lessen the expense. The remodelled drawings had been made nearly satisfactory to the proprietor, and a final consultation was held between him and the designer, at the close of which he requested the latter to lend him tracings of the plans, in order that he might consider them a little further by himself. The clerk unsuspiciously did as requested, whereupon the proprietor had the drawings traced, and sending back the originals with an insulting letter, proceeded to submit his stolen copies to another contractor for estimate, saying that the plan had been made by "one of his friends." The second contractor happened to be a relative of the clerk, and learning the circumstances, or recognizing the plan, took the liberty of putting the tracings in a place of safety, for restoration to the rightful owner.

THE inquiry which the clerk makes of the editor of *La Semaine* is, whether he can collect payment for his work on the plans and specifications, and if so, at what rate? The reply is, it must be acknowledged, anything but encouraging to persons who desire to combine in themselves the functions of architect and contractor. In the editor's opinion, a proprietor who requests an architect to prepare plans for him implies in that request a promise to pay him the customary compensation for his trouble; and the architect, like the member of any other profession, has only to prove employment in his professional work to recover the usual remuneration. With a builder's clerk the case is very different. His business is not to make designs, but to help his employer in securing and executing contracts; and neither the proprietor nor other persons would ordinarily see, in the fact of his preparing plans and specifications for a building, anything more than an effort on the builder's part to make sure of a contract which he might lose in the chances of competition if an architect were employed in the usual way. That this would be the ordinary understanding in such a case, in default of any agreement or stipulation to the contrary, is shown, as the editor thinks, by the simple consideration that no one, if it were customary to pay architects' fees to builders' clerks for such work, would choose the inexpert and irresponsible service of the latter in preference to the educated taste and skill, and greater pecuniary responsibility of the professional man. The editor is further of opinion that the preparation of plans and specifications by a builder's subordinate not only does not entitle the latter or his employer to compensation, but furnishes no ground for claiming a preference in the award of the contract; the understanding in such cases being, as he thinks, that the plans are made simply as an inducement to the proprietor to enter into the contract for their execution. They may accomplish their object, if the builder is fortunate, but if not, he is only entitled to his labor for his pains.

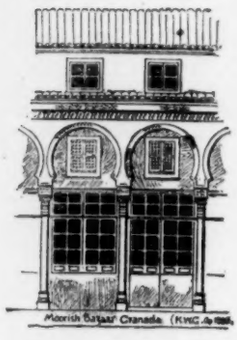
AS showing the tendency in all civilized countries toward the development of practical, or, as it might be called, active education, as distinguished from mere passive mental acquirement, it is interesting to note the increasing number and almost invariable success of well-managed technical schools. One of the most recently established, which possesses also a special interest for architects, on account of the subjects to which it is exclusively devoted, is a school of building construction and mill-engineering, at Neustadt, in Northern Germany, which opened in April, 1882, with seven students. At the beginning of the winter term in the same year the number of students had grown to thirty-six, and the term which has just commenced, less than eighteen months from the opening of the school, finds the attendance increased to seventy. This remarkable prosperity certainly indicates that the school in question, the only one of the kind, so far as we know, which restricts its instruction to so narrow a field of science, meets a want widely felt, and the suggestion is worth keeping in mind by those interested in technical education in our own country.

THE *Deutsche Bauzeitung* gives a fragmentary table, showing the length of telegraph lines in the principal countries of the Continent of Europe, and giving also the number of subterranean lines in each. The latter detail will surprise some of those who have been led to imagine that overhead lines were exceptional in Europe. As might be supposed, the German Empire heads the list, with a total length of lines amounting to about one hundred and sixty-two thousand miles, of which about twenty-three thousand are underground. Russia comes next, with about one hundred and thirty-nine thousand miles of wire, of which only one hundred and fifty-five miles are below the surface; and France is third, with one hundred and thirty-one thousand miles of line, of which seventy-two hundred are underground. Austria and Hungary have ninety-two thousand miles of telegraph, including three hundred and fifty-four miles of subterranean line; and Italy has about fifty-six thousand miles, all, apparently, being overhead lines. In North Germany there is one telegraph station to every four thousand three hundred and eighty-eight inhabitants. France has one to six thousand four hundred and forty-two inhabitants; Austria, one to eight thousand five hundred and thirty-four, and Russia one to twenty-seven thousand and ninety-one. There is something astonishing to us, employing electrical communication so freely as we do, in the idea of twenty-seven thousand people finding a single telegraph station sufficient for their needs; but we cannot judge by our habits of those which prevail among peasants and serfs. It is a pity that the statistics for Switzerland were not given. Although the length of lines in that small country would be inconsiderable, there is perhaps no rural community which makes more use of the admirable telegraphic service provided by the public authority.

THE *Scientific American* publishes some observations upon the use of cast-steel in place of heavy forgings of wrought-iron, which seem to indicate that the steel, properly made, is superior in most respects to the iron, being more uniform in substance, where large masses are used, as well as stronger. The most serious danger with cast-steel in heavy blocks, as with cast-iron, arises from possible inequality of cooling, which is liable to produce internal strains, like those which so often destroy badly designed iron castings, and it is necessary to lessen such strains by annealing. The ordinary process of annealing consists in heating the completed casting again to light redness, and after maintaining it for a certain time at a high temperature, allowing it to cool slowly. This operation, by actual test, considerably increases the ductility as well as the tensile strength of the steel, in addition to its effect in equalizing internal strains. One French manufacturer of large steel castings, after annealing tempers the work in oil, and finds that this process, especially if repeated, adds still more to the strength and ductility of the metal. It is to be hoped that the use of cast-steel will before long be extended to architectural work. In the form of lintels, for instance, such as are used over small openings in brick walls, the substitution of steel for cast-iron would not only very much diminish the weight of the pieces, but would offer much greater security, while steel-rolled beams would be as much superior for floors and roofs as for railway purposes.

SPANISH ARCHITECTURE.[1] — IV.

GRANADA.



"YOU are going to Granada! Ah! then you will have the delight of seeing the snow mountains and the Alhambra." A vivacious daughter of Andalusia thus betrayed her envy of the pleasant prospect before me as I started on another journey; and when I replied "Yes, the Alhambra and the snow mountains," I reflected upon our different anticipations indicated by that order of enumeration of the two great attractions. In the semi-tropical climate of the Southern lands of Spain — the "*tierras calientes*," as the inhabitants call them — the cool bright snows are luxuries of the first value. whether spread for the enjoyment of the sense of vision upon distant peaks, or broken into drinking cups in the arid streets of cities far below. I appreciated the preference, but I had seen snow in abundance elsewhere; while there is but one Alhambra, and that I knew only by copies and representations whose excellence only stimulated further the desire to see the wondrous original. I never approached a place with greater expectation and happily never found the realization of my hopes more real and satisfying. In these days of abundant information, — of pictures and descriptions and photographs, — the traveller soon learns that realities rarely agree with previous conceptions, for these, derived from the impressions of others (generally too, the most enthusiastic among others) and heightened by his own sanguine interpretation of them, often come face to face with a fact which is in itself very different, or, it may be, is discovered under such unfavorable circumstance and aspect that disappointment results. Still, as I found myself, at last, really on the journey — one day's journey — to Granada my hopes ran high: I revelled in visions of Moorish splendor as the train rattled through the monotonous groves of olives, till their miles and miles of provoking regular rows exhausted the patience of the retina, and ceased to be reposeful. I think there is scarcely anything more irritating than the long continuation of these uniform vistas, speeding back out of sight only to make way for exactly similar things. Eventually the last of them was left behind, and the bases and spurs of the great Sierras broke into the path of our railway and offered it many an engineering problem. There is interest in a journey among crags and precipices, even if made by steam. The train itself acquires a little grace of movement in winding along this inclined path of curves and doubles as changeful as the track of an idle skater. And that day the sunlight was living and lavish of color, so that the gray rocks, bare and crumbling, appeared almost as rich as the flower-dotted turf, and the ploughed soil (where occasionally that operation was practicable) lay in reds and browns and yellows, like tints on a giant painter's palette.

There are pleasurable sensations, too, in listening to the laborious breath of the iron horse as he surmounts the newly conquered fastnesses of nature; and more, when with brakes hard drawn, hissing and creaking and with steam rushing unworked through the safety-valves we thunder down a declivity into a torrent-worn valley. So, upward at one time, and downward at another, gaining a little elevation at each alternation, we get fairly into the mountains, and presently turn a beetling cliff, and suddenly stop at a station — Loja. It is a lovely situation at any time, and now, in the magnificent glow of the sunset, the verdant little valley seems almost ideal. And the ancient village with buildings and inhabitants rivalling each other in old-time picturesqueness, provokes another of those wishes to change the programme and stay here a day or two. One can understand, overlooking this scene, how in old days villages, and even cities, existed and grew, apart from the rest of the world. In such places as this — a little Eden walled in with inaccessible precipices and toilsome wildernesses of rock — strong inducements were required to move an inhabitant. Darkness closed in as we hurried away up the valley and Granada was reached in the night.

After all, I did see and delight in the "snow mountains" first; for in the early morning I opened my window to the bracing wind, and looked upon that landscape which called forth such poetic praise from the Arabic historians, the Vega — garden of the world — that land of delights for the loss of which Boabdil wept. The hill where he stood and gazed for the last time upon it is still known as that of "El ultimo suspiro del Moro." There, it is said, the mother of the vanquished king tauntingly exclaimed, "Thou dost well to weep like a woman for that which thou hast not defended like a man." A little later Charles V, upon beholding the charming landscape, said "Ill-fated the man who lost all this." Now it lay, beautiful as ever, before me; the plain in the fresh bright greenness of spring spreading far away to the uplands in the southeast, there to rise and burst into peaks of jagged rock scraping the great clouds. And when these crept up and back like a curtain drawn from before a picture plains and summits of gleaming white seemed to approach from their distance, and stand nearer than the groves below. These Sierras are not very abrupt or precipitous, but rise in superb slopes of white, broad-sweeping snow-fields, whose perspectives are lost in the skies upon such a day as this, when they are as beautiful, in another way, as the steep Alps of Switzerland.

And then the Alhambra! The first view of it was a charming surprise. We have all heard of the graceful lace-like arches, and delicate columns, and intricate ceilings which help to make up the interior. I knew a little of what to expect there; but I was utterly unprepared for the grand dignified beauty of the outer walls and towers. A steep rough hill which looks as if it had disengaged itself from the buildings of the city by its own will, rises at one side of the main street delightfully clothed with tall-stemmed elms and cherry-trees, just now so lightly foliated with their earliest brilliant leaves that they decorate without hiding the rocks and buildings. Here and there a tiny stream or a noisy brook big enough to turn a mill hurries down the declivities and joins the Darro River below, and on this hill, spread along the uneven edge of the broad top, is the Alhambra of battlements and towers, noble in massive proportions, beautiful with the colors of the warm red stone which gives the name to the fortress, overlaid with the indescribable tints and bloom of age and vegetation. It is as irregular, taken as a whole, as painter could desire. Stretches of timeworn walls of varying heights, with, at one angle a broad low tower of circular form; at another, one totally different, square and lofty; and again, farther east, the great massy "Torre de Comares" which contains the famed "Hall of the Embassadors." Yet no sign of the elaborate beauties of the hall show on this outer face of the tower, unless the windows with their regularity and fine proportion may be so considered. Even these appear small and fortress-like in conjunction with the breadth of walling they stand in; for the ten feet of wall, enclosing as it does a large chamber within, is so much larger without, that the comparative proportions of the arched openings are changed and a different character given them. It is quite a long walk all around these splendid old walls, since the hill which they cover is more than half a mile long and an eighth of a mile wide, and although that part immediately above the Darro, and the opposite face overlooking the lower part of the city, are the most picturesque, there is in every part some tower or other object of interesting aspect, and a new group of rock and building and tree which deserves a sketch. The south side is laid out in steep terraced roads on the slope of the hill through what is called the Garden of the Alhambra — a grove of tall trees refreshed by many a rill and fountain — by which one arrives at the principal entrance, the beautiful old "Puerta de la Justicia" with its emblematic "open hand" and key carved over the horseshoe arches. Just below it stands, with its back to the retaining-wall of the roadway, a fountain of poor Renaissance design, an intruder, but a little more tolerable than usual, since it has become water-stained and mossgrown so that it seems to belong to the gardens and walks rather than to the older edifices. Within the gate, reached by such a doubled and covered way as the ancient warriors knew would be difficult indeed for an assailant, is a broad open "plaza" with rather an incongruous appearance. Among the Moorish walls, many of them in dilapidated ruins, there are some of those disagreeable bits of Spanish works of stucco and wood which I have grumbled at before. There is the citadel with magnificent views from its bastions and notably from the "Torre de la Vela," and there is the large palace which Charles V began but did not finish, standing with its bare roofless walls where formerly some of the finest Moorish chambers were. In another place it might deserve a little consideration, for some of its "Bramante" classic features and sculpture are good examples of their kind, but one cannot but regret that it is here. Behind the palace is found a door where, upon entering, the whole place changes its character and aspect. So far I had been delighted with a grim old fortification, strong, but unadorned except by nature. Here I stepped into a fairy palace, ancient looking still, but even in old age looking like the abode of such creatures as we loved to imagine made the beautiful frost ferns on the window-panes. Perhaps the effect is partly due to age. It may be that time effaces somewhat the more apparent human origin of newer work. I had seen good drawings and models of these decorations: at the Crystal Palace at London is a faithful reproduction of one of the finest courts and I had studied that; but the original was as new to me and as surprising as if I had no previous thought of it, and although I may as well confess to more enthusiastic admiration of these works than some critics award them, yet I observed in all who were competent to form an opinion, the same surprise — the same evidences that the fact surpassed their expectations. It is hard to account for. I do not think it arises from the artistic beauty of the palace *per se*, but from that in connection with the stirring histories and enchanting romance and the other multitudinous associations which blend their attractive values with those of the stones and handiwork they have grown upon. Theoretically, this court, or that chamber, ought to be as beautiful in Boston as in Granada, yet I can realize that it would not possess all the charm, and therefore, while I speak of these relics in the extreme of appreciation it is with the consciousness that it is only in this place that their fullest expression is possible. Probably the maximum of architectural beauty is only attainable when it is expressive of the history or circumstances of its own locality, and it is almost as sure that the highest enjoyment of it is only reached by a proper understanding of those circumstances. If these propositions be true (and experience supports them) they are sufficient to explain some of the disappointments of ambitious architects. Nevertheless, it may be

[1] By Robert W. Gibson, Travelling Student of the Royal Academy. Continued from page 220, No. 411.

well to end this digression by recalling the spirit of adaptation of the Mudejar style and so avoid a misinterpretation of the above which might make it mean that *none* of such exotic beauties can be translated. The Moorish palace within the Alhambra as it is now seen covers only a very small proportion of the total area, and although I cannot pretend here to give a description in any sense complete, still, to make what follows intelligible some notes of the arrangement are necessary. By the insignificant door at present used as the public entrance *a* (the letters refer to the accompanying sketch-plan) one reaches the Court of the Fish-pond, *b*. On the left, *c* is the fine Hall of the Embassadors within the Tower of Comares; near it at *d* is the Mezquita with its interesting court. Crossing the Court of the Fish-pond an arcaded vestibule leads to the renowned Court of the Lions, *e*; on the left, *f*, is the Hall of the Two Sisters, and opposite it the Hall of the Abencerrages, *g*, and at the end of the court the so-called Hall of Justice, *h*. Now, going through the Hall of The Two Sisters and passing the alcove said to have been the boudoir of the sultana, *j*, we overlook the garden of Lindaraja, *k*, beautiful with flowers and oranges even now. At *l* are the Moorish baths, and thence a corridor commanding magnificent views leads to a little chamber, *n*, mistakenly called the Queen's Dressing-Room. It is more like an observatory.

These courts and halls, and their numerous vestibules, and alcoves, and arcades constitute the chief attractions of the palace, although many other buildings are included in the Alhambra. I wandered through the labyrinth again and again until I began to know something of its shapes and locations, and each time I came into each part the impression grew more powerful upon me. A day or two was passed in this enjoyment before I felt familiar enough to sit down in one spot, and sketch with the concentrated attention such work enforces. It seemed better and more profitable at first to watch and compare. I say watch because some parts appeared to change their expression, under varying lights, like animated nature. The rich, full, restful beauty of deep shadowed chambers seen through arches whose pearly delicacies glistened in strongest sunlight at noonday was altogether different from that life which seemed to come to them in early morning, when the newly-risen sun penetrated nearly horizontally into the deep recesses; and again, late in the day, it was a new delight to wander over the same spots and see them darken and blot out into mysterious shadows as night fell; and in these reflections I realized how hard it is to analyze the principles of beauty in architectural works. This palace is scarcely a great specimen of architecture in the truest sense of the word. The methods of construction are not so good as in many less impressive styles. Walls are often of enormous thickness, not because massive effects were desired; on the contrary, lightness was always sought in appearance, but poor materials and inferior workmanship in actual wall building evidently compelled these heavy proportions. Then there are no new principles or developments of old ones, as are seen, for example, in Roman and Gothic work; nor were they wanted by the designers any more than they are missed by the beholder. There is more of constructive architecture in the forbidding external fortress than in the luxurious palace. Here the simplest and most primitive structures are overlaid with decoration all-sufficing in its own complete beauty. The style is in fact one of decoration, in which the structural works are only the vehicles of the art applied to, and not in, them. If the Moor could have erected his delicately moulded and carved wall linings of plaster and wood without the walls themselves he would gladly have done it. Indeed, it might almost be said that this was actually done, for in some spandrels, over arches, and in other similar situations we find only a light frame-work supporting the plaster which is pierced on either side, and shows the depth of the hollow within. (The width of space, measuring as we would measure a wall, is about eighteen niches in the instance I have in mind.) Again, the forms of the secondary features of arches, such as foliations of soffits and the treatment of face are not constructional at all, as are the cusping and moulding of the Gothic arch. They are expressive forms it is true, but their expression has regard to the grace of the lines and curves of the arch and opening as a whole. It takes no notice of voussoirs, and often ignores even the radiating principle; yet in many other Moorish buildings there are examples of the quick recognition and emphasis of these characteristics, so that it is rather surprising that here, in carrying the decorative treatment to such greater elaboration (in which there is no sign of decadence) the Moors of Granada avoided them in the palace. The columns with their capitals must be mentioned as an exception, for nothing could better embody the idea of graceful upward strength than these slender marble shafts; and the lines of the lower part of the cap, straight up and down, leading into the leaf-forms above, are equally indicative of the forces they resist. The column and capital are themselves made beautiful by accentuation and not concealment of their office and construction. Now when we consider the importance of the evidence of strength in a column, and the sense of insecurity which is engendered by certain twistings and carvings to which experimentalists in other styles have submitted them, it becomes clear that these artists dealt with them aright, seeking in slender, delicate proportions the desired expression of independence of gravity. The stalactite ceilings again reveal no trace of their means of support. They hang high overhead, beautiful and evidently secure, but the evidence is gracefulness. You cannot even guess what upholds them. How different is all this from the northern ribbed vault, in which one may trace stone by stone, from rib to shaft and down to the ground the disposition of weights and resistances. Even in the wooden Artesonado ceilings of the Moors the beams are generally disposed, not as weight-supporting beams, running from wall to wall, but in radiating and intersecting lines to develop beautiful forms. The whole system of this ornamentation seems to proclaim that the tiresome cares of life are to be put aside and forgotten — they who dwell in these halls shall take no thought of how or why things are—they are, and they are beautiful, and that is enough.

It will be noticed that the construction so ignored is only that which is concealed by the ornament. This in itself obeys the laws necessary for the sense of security, and is disposed in lines and masses, which, although regardless, as I have said, of the actual methods of building of the walls and arches which bear them, yet do satisfy the eye with an expression of their own fitness and lightness, an assurance that they will not fall, because they have no weight and because they belong to the positions they occupy.

Among beauties so numerous and varied, it is difficult to choose one for especial study. Unfortunately it was neither possible nor advisable to sketch the whole, piece by piece, as I would have liked. (What delight a man might have in being the first explorer of remains like these.) At last I got seriously to work in the "Hall of the Two Sisters," so called from the great twin slabs of marble which form the centre of the floor — a prosaic origin for the name of a chamber in the Alhambra, where so often a romance or a tragedy lies hidden in a common name. This hall is very little injured by time, and not at all restored; and although the restorations here are all well considered and ably carried out, there is more interest in a part that is all of undoubted antiquity. The Alhambra was commenced in A. D. 1248, by Ibn-l-ahmar, whose motto, "*Wa la ghalib illa Allah*" — "There is no conqueror but God" — is introduced in countless repetitions in the decorations, and notably in this hall. In the centre of the square marble floor a little fountain sends its bright jet of water to fall musically into the shallow, flat basin, if so it may be called — it is only a few inches deep: thence the water trickles along a channel in the pavement, forming tiny cascades over the steps, out into the Court of the Lions, to join forces with the principal fountain and three other similar channels coming from different halls. The view here given is taken looking toward the arched doorway leading to the court, and through it are seen the colonnades, with their light traceried arches. Opposite this doorway is a similar one, and on the other two sides other arches open into alcoves. All four are most beautiful examples of the rich plaster decoration, cast and carved in low relief, and enhanced with colors and gold, which now is faded and timeworn into neutral browns and grays. A dado of elaborate Azulejo tile-work decorates the lower portion of the walls. Over this are bands of ornament with inscriptions. The second one is entirely made up of the pious motto lately quoted,

The Inscription "Wa la Galib Illa Allah" "There is no Conqueror but God" common in the Decorations of The Alhambra: Portion of Band from the Hall of The Two Sisters

worked in Arabic characters, and which I have drawn to a larger scale. It is noteworthy how much care was bestowed upon the minutest detail. Not only are the characters most beautifully formed, but the twining ornament which fills the background is a study by itself. The feathery leaves, of studied grace of outline and movement, are made up with a systematically varied branching, which is the essence of natural growth. Over this the wall-space is divided up by bands of ornament, or of the geometrically formed Cufic character in inscriptions of poetic fervor truly Oriental, and the broader portions are filled with diapered patterns, geometrical in primary lines, with leaf forms in star-shaped panels. Over the doorways arched galleries open toward the hall, repeating somewhat the lower and larger features; and then begins the splendid stalactite ceiling. First springing from little columns engaged upon the walls, and breaking into an octagon by pendentives over the four corners, it rises in this form above the surrounding roofs, with windows formerly fitted with interlacing tracery and brilliant stained-glass. Then

the stalactite dome closes in a complicated and intricate multiplication of tiny cells; yet these show upon a closer inspection a system and method which is surprising in its simplicity. Several of the able artists who have described the Alhambra so well have written extended descriptions of these systems; it is therefore unnecessary here to do more than mention them.

"The Hall of the Two Sisters" [*see Illustrations*] is said to have been one of the chief private apartments, the alcoves being sleeping-rooms, and the galleries devoted to the use of the harem. The arches were fitted with elaborate wood lattice screens. Altogether the Hall is one of the most beautiful apartments in the Alhambra, with its symmetrical disposition and variety of accessory chambers; and its considerable size and good state of preservation add again to its interest.

The drawing of the capital is from the open corridor leading from the "Hall of the Two Sisters" to that of "The Embassadors"; not its original position, evidently; probably it was re-erected there in the alterations made by Charles V. It is very delicately carved in marble; the labor and cost seem not to have been considered in its production. The arabesques upon the lower octagonal part are almost as minute and highly finished as if for jewelry. The upper part is a kind of *résumé* of the method of stalactite decoration, exemplifying both its rules and its freedom. Although so small in carved detail, its elaboration was not sufficient for the Moorish artists who made it; for there are traces of still more minute ornament in color upon the little patches of plain surface which remained, and all the carved part was evidently colored in detail, with care and taste that would be considered enough for a whole building according to modern ideas. There is a chapter of art in this small capital.

LECTURES ON ARCHITECTURE.[1] — VII.

AMONG the Norman nobility who had followed William into England, the rage for erecting fortified castles was quite as great as that for ecclesiastical buildings among the prelates. The common people of the country and even the burgesses in the larger towns were not better lodged than in the previous age; their condition indeed was not in any way improved. In London, even, towards the end of the twelfth century, the houses were still built of wood, and covered with reeds or straw. But the castle-palaces of the Anglo-Norman kings, nobility and prelates, were of a very superior construction. William of Malmesbury, an ancient chronicler, relates that the Anglo-Saxon nobility squandered their ample means in low and mean dwellings, but that the French and Norman barons lived at less expense, though dwelling in large and magnificent palaces. The system, in fact, had become necessary to them, from the previous habits of the country they had left, as well as from their situation in the island where they had settled. Surrounded by vassals whom they held in subjection by the force of arms, and whom they constantly oppressed and plundered in every way, they were so detested by them that deep fosses and lofty walls were indispensable to their security. The Conqueror himself was well aware that the want of fortified places might accelerate his expulsion from his new possessions, no less than it had aided him in his easy conquest of them, and he resolved to guard against such a contingency by the strong castles which he everywhere placed within the royal domains. So much was the practice a matter of course, that the moment one of the nobility received the grant of an estate from the Crown, a castle was built upon it for his residence and defence. And this feudal spirit was not likely to be diminished by the disputes relative to the succession to the Crown, in the following reigns. William Rufus, the son, was as much addicted to the erection of royal palaces and castles as his father, and the stupendous castles of Dover, Windsor and Norwich sufficiently prove that no monarch exceeded him in the strength of his massive structures. Henry I also followed in his steps; but in the reign of King Stephen, the *Saxon Chronicle* asserts that every one who had the ability built a castle, and the whole kingdom was thus covered with them, no fewer than eleven hundred and fifteen having been raised from their foundations in the short space of nineteen years. The assertion of the *Chronicle* would thus seem to be by no means stronger than is justified by the historical facts.

As the castles of old England are so intimately connected with all our ideas of the ages of feudalism and chivalry, it may be proper to give some concise general description of these curious structures. As it was to serve both for residence and defence, the castle was usually placed on an eminence, near a river, and often on the very banks of the stream. Its figure, on the plan, was in general of great extent, and somewhat irregular in form, varying in almost every case according to the natural disposition of the surface, and it was always surrounded with a deep and broad ditch, called the *fosse*, which could readily be filled with water. It was crossed by means of a drawbridge, which could be raised at a moment's notice, and an outwork, called a barbican, designed for a defence of the great gate and drawbridge was placed before the latter. The walls of the barbican were of solid masonry, eight or ten feet in thickness, and from twenty to thirty feet high, with a parapet and open embrasures called "crenelles" on the top. At proper intervals above the wall, square towers were raised, of two or three stories in height, wherein were lodged some of the principal officers of the castle, with apartments for the common servants or retainers, and rooms for the granaries, storehouses, and other necessary offices. The top of the walls and the roofs of the towers were flat, that the defenders, placed there in the event of a siege, might the more safely discharge arrows, darts, and stones on their assailants. The great gate was placed in some convenient part of the wall, flanked with a tower on each side, and closed with massive oak folding doors, plated with iron. An iron grate or portcullis was also lowered by machinery from above. Within this exterior wall, in the larger castles, was a large open space or court, in which a church or chapel was usually placed. Beyond this court was another ditch, wall, gate and towers, like the first, inclosing the inner court, in which was erected the large tower, the "keep" or stronghold of the castle. It was a large structure, four or five stories high, whose enormously thick walls were pierced with very small apertures, serving barely as windows to the gloomy apartments upon which they opened. This great tower was the dwelling of the lord of the castle, and in it the constable or governor of the fortress was also lodged. It was provided with dismal apartments underground for the confinement of prisoners, and the whole building received the appellation of the *donjon* or dungeon. The great hall was also in the keep, in which the friends and retainers of the owner were entertained. At one end of the great hall a platform was raised a little above the rest of the floor, called the dais, and on it stood the table at which persons of higher rank and distinction were always placed. The varieties which occurred in the arrangement and distribution of castles were of course different as circumstances varied, but the most extensive of them were erected very nearly on the plan which has been described.

The taking of Bedford Castle by Henry III, in the year 1224, is minutely described by the old historian, Matthew Paris. The castle was taken by four separate assaults. In the first was taken the barbican, in the second, the outer court; in the third attack the miners threw down the wall by the old tower, where, through a chink in the wall, and at the utmost risk, they gained possession of the inner court; and on the fourth assault the miners fired the great tower, which became so much injured and split that the defenders thought it best to surrender. . . .

On the permanent establishment of Christianity, in the fourth century, its followers were not driven to the necessity of devising any original and typical arrangement of their churches, or of inventing any architectural symbolism of their own. They did no more, at first, than simply to convert to their own use, nearly as they found them, a class of secular buildings already existing, whose very name, even, they still retained. It is supposed by some writers of high authority that it was their aversion to paganism which led them to prefer adopting the basilicas to the ancient temples, for the uses of their worship; but we may find another obvious reason for their doing so in the fact that the former were, in all their arrangements, infinitely better suited to their new purpose. While the temples of the ancients were for the most part very small and confined within, the Roman basilicas, on the contrary, which served the double purpose of a forum or exchange for merchants in the main body or nave of the edifice, and a court of justice at the upper or chancel end, were expressly adapted to the accommodation of a large concourse of people. Besides their spaciousness, this twofold arrangement pointed them out as particularly suitable for the service of the

[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 236, No. 412.

new religion. The tribune, or spacious semi-circular recess which had been the distinguishing feature of the secular basilicas, became that of the ecclesiastical one, also. This part of the edifice, which had been the seat of the prætor and other magistrates of the civil tribunal, was now appropriated to the bishop and his attending clergy, and in front of this was placed the altar, in the centre of the chancel, which was raised several steps above the pavement of the rest of the building. This division of the plan was further marked, in many instances, by a large arch resting on columns on each side, and corresponding with the wide of the tribune, and the idea of this is still clearly retained in the chancel arch of the Gothic churches. The forum or great hall of the building, with its colonnades and ambulatories, was of course assigned to the laity of the congregation; nor could any arrangement have been better devised for imparting a visibly august character to the rites and solemnities of the church than that which was thus directly supplied by the Roman basilicas. To make this arrangement more distinctly understood, I would state that the interior of the old King's Chapel, in Tremont Street, Boston, with its square body divided by rows of columns, and its recessed chancel at the eastern end, is constructed almost precisely upon the plan to which I now refer, though the recessed space is perhaps somewhat smaller than the tribune of the ancient halls of justice. But in the little Episcopal church in Old Cambridge the proportion is better observed, and we notice the closest adherence to precedent in this small, but justly admired masterpiece of the art.

It would certainly appear, from an examination of the Roman basilicas, that what has always been considered one of the most obvious expressions of Christian symbolism in our churches — namely, the triple division of the main body or larger portion of the edifice into the nave and side aisles — was unconsciously borrowed from their heathen prototypes. At any rate, the symbolism must have been, in the first place, purely accidental, it being furnished by the very same disposition in the original structures. It has also been thought that the symbolism of the cruciform plan of the Gothic churches — for all the cathedrals and many of the larger parish churches in this style extend over the ground in the shape of a cross — is also to be discovered in the early Christian basilicas. It is true that this form is rather *hinted at* than fully expressed in them, by the transverse portion at the upper end, since that part did not extend itself *outwards*, nor was the general parallelogram of the plan at all broken, save by the semicircular projection of the *apsis* or tribune at the altar end. It follows that not even any tendency to the shape of the cross was shown externally, except in the *upper* part of the building, owing to the whole of that transverse division being of the same height as the nave or centre, while the side aisles were considerably lower, and were roofed over against the main body of the structure; but it is still easy to see in this the germ of the cruciform plan which was subsequently adopted, and it is highly probable that when the idea of this symbol occurred, it was at once carried out in full. The precise manner of the change cannot now, with any certainty, be determined, but it seems to be a question very similar to the one to which I have before adverted in the case of the Grecian temple, in which, though its origin was clearly a refinement upon rude stone structures, the component parts and members of a wooden hut yet seem to be pointed at and imitated. It is perhaps enough, in either case, to suppose that the resemblance was at first purely accidental, but, being noticed, was afterwards improved upon, and carried out to such an extent as almost to lead to the belief that it always existed in the mind of the builders.

On the exterior of the ancient basilicas there was scarcely any attempt at architectural design. With the exception of a low portico sometimes continued along the front, the exterior was of a very bare and homely appearance; nor did the windows at all conduce to architectural finish and expression, as they do in even the plainest buildings in the Gothic style, they being here no more than naked, arched apertures in the wall. Even within the edifice there was a singular mixture of magnificence and rudeness, of sumptuousness and poverty — numerous columns of the most precious marbles, and sometimes of the most exquisite workmanship, and rich mosaic ornaments, which contrasted strangely with heavy surfaces of bare wall, broken only by mean windows, and covered with open-timber roofs, rudely squared and carelessly put together.

When these new temples of religion were erected, at once, from the ground, and intended to be used as churches from their commencement, they nevertheless borrowed so much in the idea of their *whole*, as well as in their details, from the ancient basilicas that it is not at all surprising that they should still have retained their name. The drawing represents a perspective view of the Church of S. Paolo fuori le Murà, from which the general effect of the interior may be completely understood. It will at once be perceived how admirably it was adapted to the reception of an extremely numerous congregation. The numberless columns which the buildings of ancient Rome supplied were put in requisition for constructing such edifices as these, but instead of always connecting the columns by architraves on their summit, arches were spanned from one to another, on which walls were carried up to bear the roofing. Under these arches we pass into the aisles, which are but little more than half the height of the nave or centre, but, running parallel with its whole length, are roofed over against the wall, above the main arches of the nave. The peculiarity of these arches being placed immediately upon the columns, or made to spring from their capitals, is the leading trait in the character of the dawning Romanesque style.

THE ILLUSTRATIONS.

HOUSES OF CHARLES A. WHITTIER, ESQ., MESSRS. McKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y., AND FRANCIS L. HIGGINSON, ESQ., MR. H. H. RICHARDSON, ARCHITECT, BROOKLINE, MASS.

An unforeseen disarrangement of our plans causes us to publish without any description a view of one of the latest groups of buildings which have been added to the attractive features of Beacon Street, Boston.

CLOISTER OF ST. JEROME, BELEM, PORTUGAL.

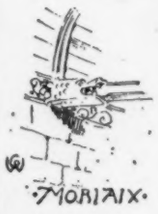
[From a *Photograph.*]

THE "HALL OF THE TWO SISTERS" IN THE ALHAMBRA, GRANADA, SPAIN. DRAWN BY MR. R. W. GIBSON, ARCHITECT.

For description see article on "Spanish Architecture" elsewhere in this issue.

SKETCHES AT PIGEON COVE, CAPE ANN, MASS. BY MR. P. GUILBRANSON, BOSTON, MASS.

THE NEW ENGLISH PATENT ACT.



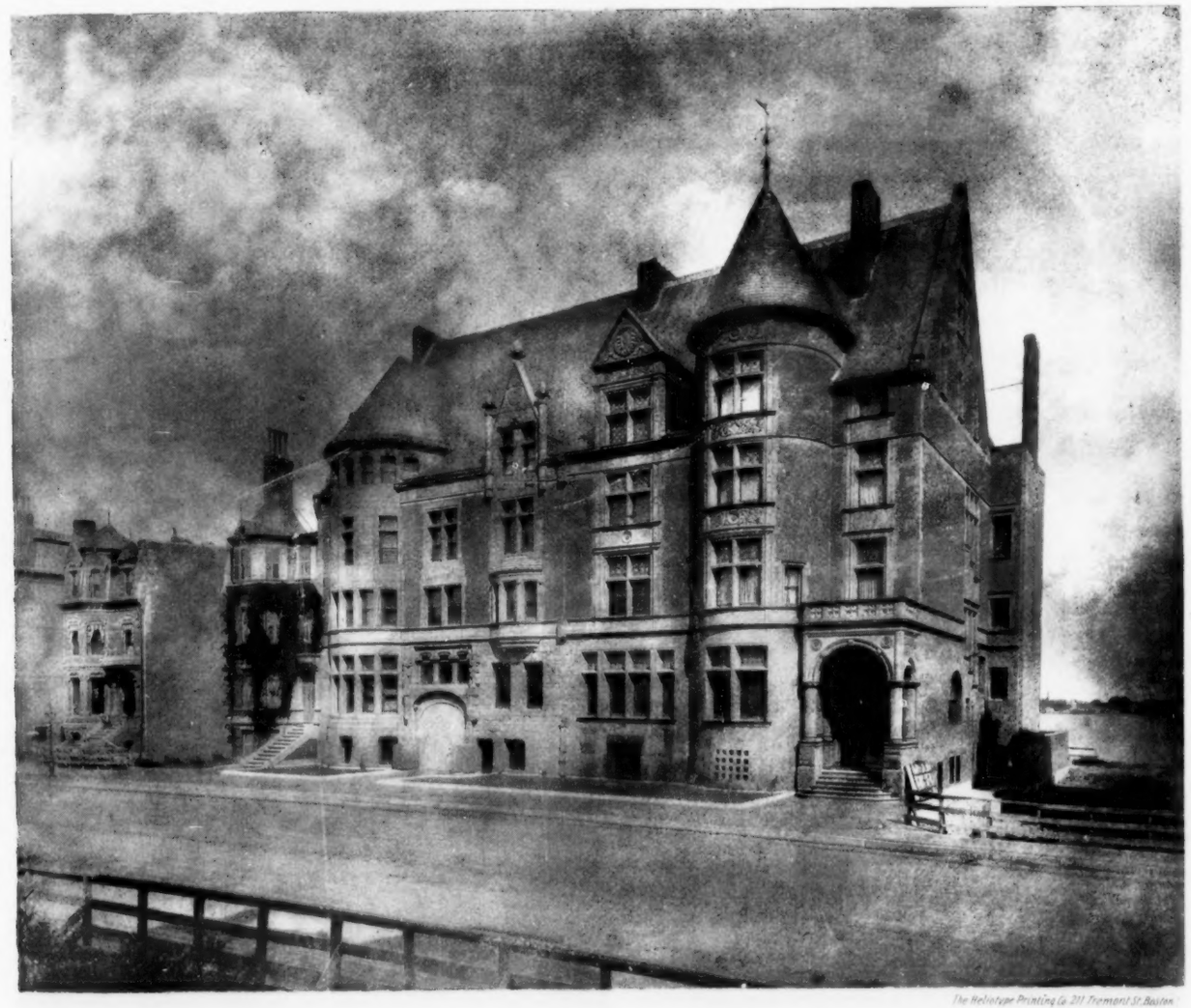
By an Act of Parliament taking effect January 1, 1884, the laws relating to patents for inventions, registration of designs, and of trade-marks in England have been consolidated and improved so as to, in the main, incline more favorably than heretofore to inventors.

In lieu of patents running in the first instance for three years, as heretofore, they now run for four years, and instead of the stamp duty of £50 heretofore payable before the expiration of the third year from date, such stamp duty and the succeeding one may be paid in annual instalments, by which means the onerousness of the tax is greatly modified. The fees payable in the first instance instead of being £25, as heretofore, are now but £4. The technicalities necessary to be considered and provided against and the acts to be done are greater than heretofore, and the specification, drawings, and other papers must now be prepared with greater care and completeness, and there are several new requirements which render it necessary that skilled and conscientious attorneys be employed. Three or more months' longer time is allowed within which the final papers may be filed than is now the case. If at any time default is made in payment of any of the fees, upon proper reason for delay being shown, an extension of time not exceeding three months will be granted. Amendments to the specification and drawings may be made at any time before the patent is sealed, upon certain proceedings being had and the request advertised. Each application is submitted to an Examiner for the purpose of ascertaining whether the papers are in proper form, if the invention is properly described, if the title properly discloses the invention, etc., but no examination as to the novelty of the invention is provided for in the new law. There is no provision in the new law for the obtainment of patents by parties who simply communicate the invention to others or pretend that it has been communicated to them, a source of great annoyance and persistent injury to inventors in the past. The new law says that each application shall contain a declaration to the effect that the applicants or applicant are or is in possession of the invention, whereof he or they claims or claim to be the true and first inventor or inventors. Appeals from the decisions of the Examiners or the Comptroller General of Patents may be taken to either of the law officers. The provisions regulating the opposing by interested parties of applications for patents are now more definite, and oppositions very similar to the "interference proceedings" in the United States Patent Office are now provided for under the English law. Patents, though granted for fourteen years, are extensible on good grounds therefor being shown, for seven or fourteen years longer respectively. The Patent system is now under the control of the Board of Trade, and the Patent Office is provided with a seal of its own with which all patents will be stamped, instead of being stamped with a fac-simile of the Great Seal of England. Compulsory licenses may be ordered in certain cases, and the amount of compenpensation fixed, by the Board of Trade.

The Board of Trade has the power to regulate the amount of fees to be levied and paid at the several stages in the prosecution of an application, such as, for instance, where amendments are made, oppositions declared or heard, advertising, appeals, etc., so that it is not absolutely certain at the present time nor can it be until after the system has got into working order what the actual cost of a patent will be, but I think it would be safe to say that a patent on a simple invention could be procured for $75, the usual charge under the present law for a simple case being $250, — a great saving being thus secured to inventors.

It will thus be seen that the new law opens up a vast field for American enterprise and that the cheapness of patents in Great Britain as compared with their cost heretofore, must, necessarily, induce a large number of American manufacturers and inventors to protect their inventions in that country, and thereby bring to

No. 413 American Architect and Building News, Nov. 24, 1883.



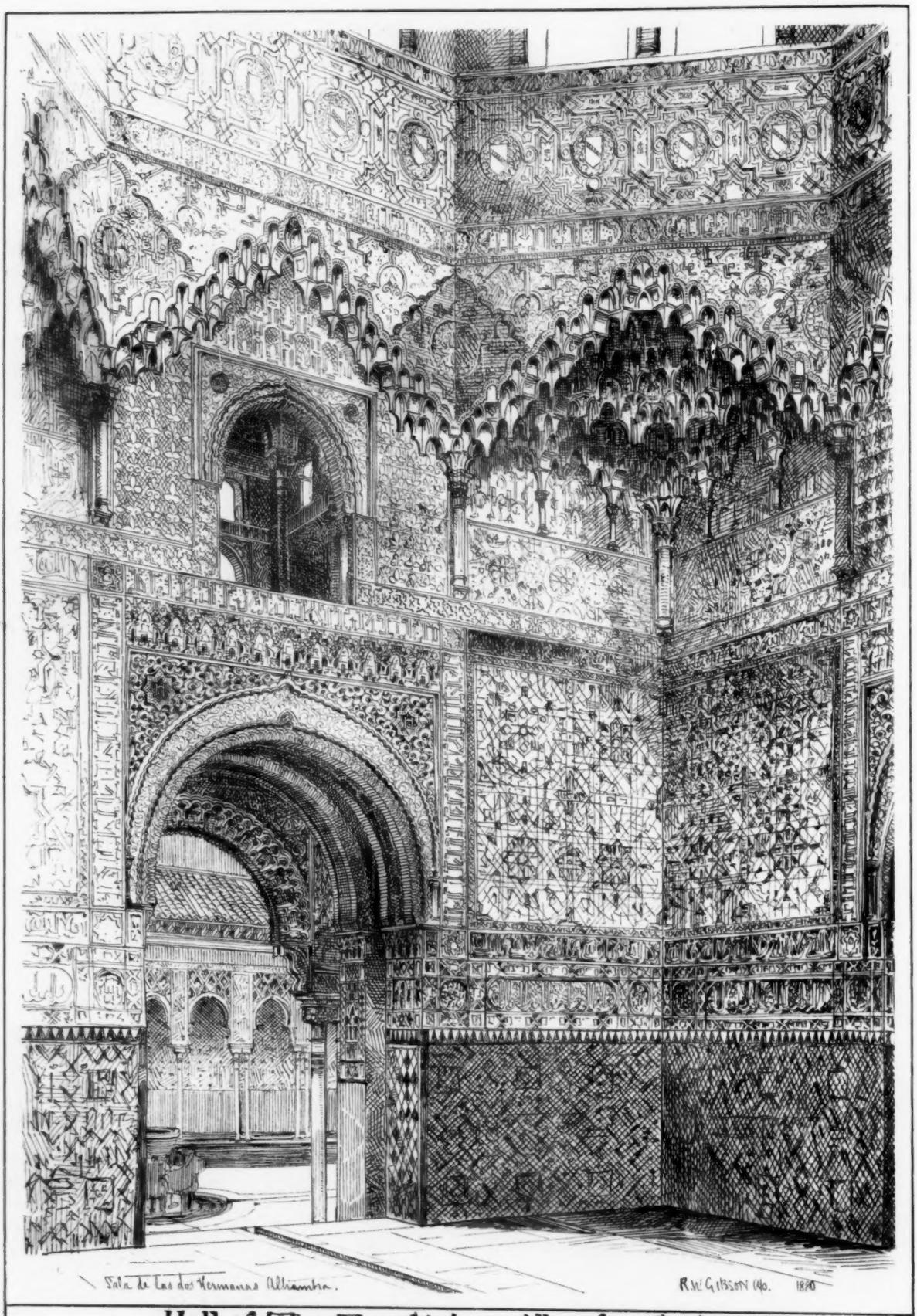
The Heliotype Printing Co. 211 Tremont St. Boston

For F. L. Higginson, Esq. — Houses on Beacon St. — For C. A. Whittier, Esq.

H. H. Richardson, Arch't, Boston.

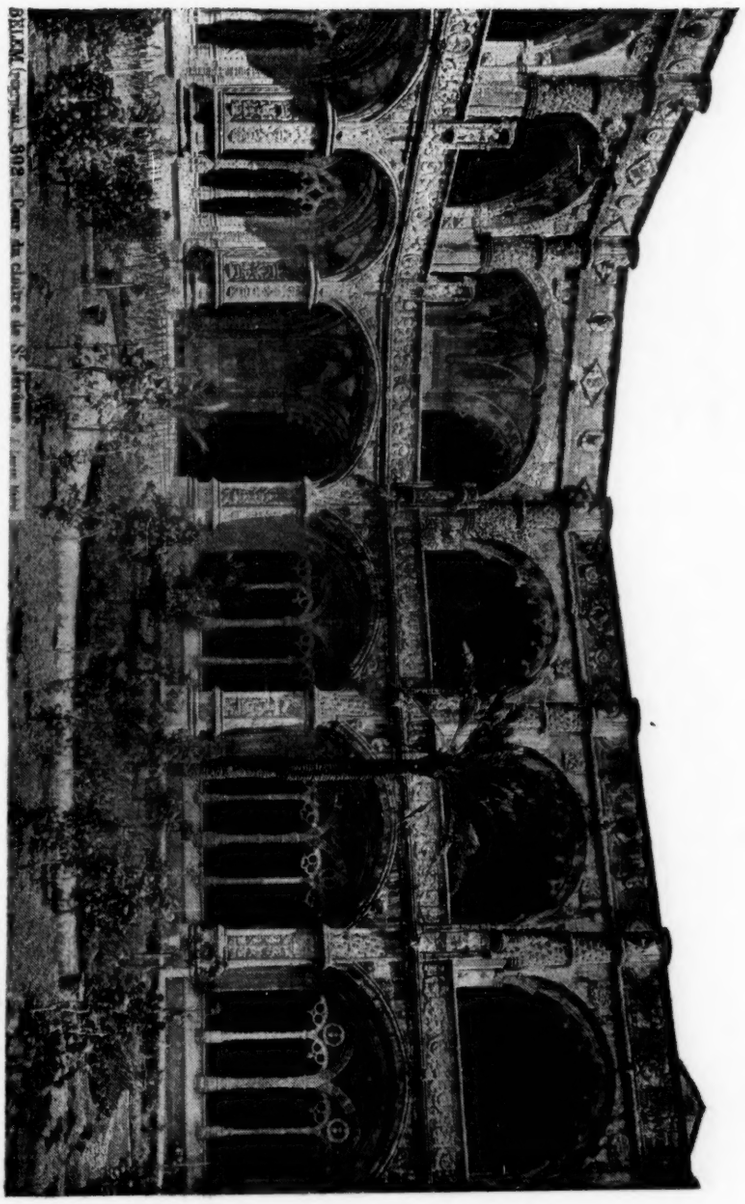
Boston, Mass.

McKim, Mead & White, Arch'ts, New York.



Hall of The Two Sisters · Alhambra · Spain:

The Heliotype Printing Co. 211 Fremont St. Boston.



BELGIUM (original). 302.—Cour du cloître de St. Jérôme, Louvain.

their doors many more customers for their wares than they are privileged to do under the present system. Even under the old system a very meritorious invention when patented in England and properly brought to the notice of the public secured large returns for the outlay, high as it was. Under the present comparatively cheap system I anticipate that a much larger number of patents will be obtained in England by Americans and others, and that, consequently, England will more generally than heretofore be found to be a good market for American goods. CHARLES J. GOOCH.

SANITARY PLUMBING.[1]—X.

THE "SELF-SEALING" CLOSET.—DESCRIPTION.

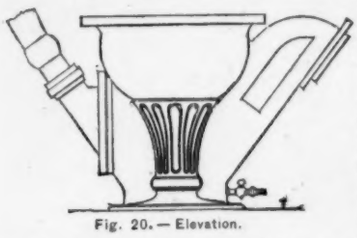


Fig. 20.—Elevation.

TO each of the types of water-closets heretofore described, except the "air-vacuum" closet, belong several individual representatives, differing from each other in detail, and though sometimes, for better illustration, a drawing of the particular closet which seemed best fitted to explain the type has been given, the description has in every case been confined, in accordance with our stated intention, to the points which were typical, leaving individual peculiarities unnoticed.

Figures 20, 21, 22 and 23 show a self-sealing closet in elevation, transverse section, plan, and longitudinal section, respectively. It

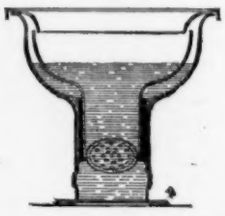


Fig. 21.—Transverse Section of the "Self-sealing" Closet.

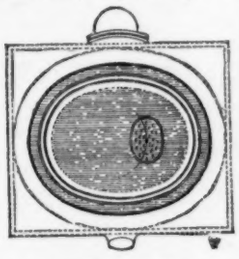


Fig. 22.—Plan.

will be seen that the simplest kind of hopper is taken as a general basis of form. A basin and a trap only are used, each forming a part of the other, and these are encased in an iron frame which serves also to conduct and distribute the flushing streams. The iron part

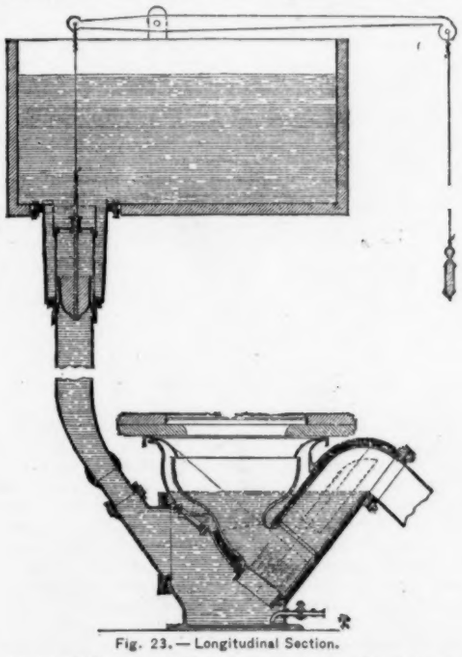


Fig. 23.—Longitudinal Section.

may be protected from rust, if desired, by enamel, paint, or any of the new processes invented for the purpose. But it requires no such protection, because the glass of which the bowl and trap are made is not discolored by rust, and the iron frame is made thick enough to withstand its action at least as long as the heavy iron soil-pipes used throughout the house.

Cast-iron soil-pipes of the proper thickness are found to be so durable that they are now put in, even unpainted, as among the permanent fixtures calculated to last as long as the house itself. Our experience so far has proved that with even and good castings our expectations have been fully realized.

The cast-iron receivers of pan-closets are usually flimsy and uneven in thickness. When, however, the castings are stout and even at the outset, they will last for an almost indefinite length of time. Good pan-closet receivers have been taken out after a use of forty years, and, when broken, found in good condition. The writer has had a number of well-made pan-closet receivers, one-eighth inch thick, which had been in use for ten or fifteen years, broken, and all were found to be in their thinnest part nearly an eighth of an inch thick still. Furnace evaporating-pans made of cast-iron are found to have the same power of resisting corrosion, and great length of life. Probably nine-tenths of all the water-closets sold to-day have their water-passages below the bowl constructed of iron. It is used in nearly all pan, valve and plunger closets for the receiver, often for the trap, and sometimes even for the narrow overflow passage; and many of the best hopper-closets are made either wholly or partly of iron. The iron and glass are so put together that they may be easily taken apart without danger to either, so that, in case of accident, either part may be renewed without loss of the other.

The Flushing

streams (*a*) enter below the level of the standing water in the water-closet, whereby their noise is deadened. Two independent streams are employed, one to eject the wastes and the other to cleanse the sides of the bowl. The entrance of these streams is through two rose nozzles, which break up the water into a large number of small jets. With a given quantity of water, the use of the rose jet furnishes the greatest possible propelling power where the body of water to be removed is larger than the combined sectional area of the jets.

The supply-pipe is made large, so that each individual jet of the rose has the same propelling power that a single jet would have under the same head of water. The jets are made very small, their power being calculated to be just sufficient to lift the small column of water in the trap above it, and between it and its neighboring jet, up to the outflow of the trap and no farther. Thus no power is wasted in driving the water forcibly against the crown of the trap to no advantage, and the full power of each jet is made use of, because the rose nozzle is placed at the bottom of the trap, whence each jet exerts its pressure and friction upon the entire body of water therein. So great is the propelling power of the jets thus used, that, with a tank only four feet above the water-closet, or, in other words, with a water-head of four feet, the wastes are instantly and completely ejected into the drain, when the dip of the trap and size of the jets are regulated accordingly, and if the water above the jets is not simultaneously replenished by an upper flushing sufficient to keep the jets covered and their sound deadened, the roar made by thirty jets of three-sixteenths of an inch in diameter is quite deafening and proclaims their power in no uncertain tones. The upper flushing stream is therefore arranged to always cover the lower jets.

A dip or seal as great as three inches is given to the trap for several reasons; one of which is because it allows of a gradual contraction of the bottom of the bowl below the normal water-level, so that the wastes may be gathered together in the neck of the bowl before the upper flushing water falls upon them. It will then have a tendency to drive the paper and lighter wastes under and out, rather than buoy or float them up, as would be the case were they distributed over a wider area of water.

The lower rose projects its streams in a direction towards the outflow, into the soil-pipe, and parallel with the side of the trap. The nozzle is made of brass and serves at the same time as a coupling to secure the glass bowl firmly to the iron frame. The upper flushing streams enter the space between the bowl and its frame below the level of the standing water, through small holes or slots provided for the purpose in a plate of brass bolted to the side of the supply-passage as shown. This causes the water to rise noiselessly and gradually until it overflows the edge of the glass bowl equally all round, and aids the lower jets in removing the wastes. The time required for the water to rise to the edge of the bowl and overflow is just sufficient to allow the wastes to descend, under the influence of the lower jets, into the neck of the bowl, where they are collected together so that they are most easily acted upon by the water falling from above.

Though the two roses act under the same pressure of water, and are both employed to flush the closet, their functions and principles of action are precisely opposite. The object of the lower rose is to *increase* the propelling force of the water; that of the upper rose, on the contrary, is to *diminish* it. By breaking up the lower stream into a rose-jet, the power is increased, because the friction on the supply-pipe is diminished in amount corresponding to the diminished volume and velocity of the water passing through it, and the wastes are removed by the *momentum* of the water. The jets of the rose have a greater effect in ejecting the wastes from the trap and bowl than would a single column completely filling the pipe, because, while they exert an equal moving force, they do not occupy so great a space in passing, but leave room for the contents of the bowl to be drawn in with them also by suction.

The upper rose, on the other hand, has for its object to break the force of the water and cause it to rise noiselessly and slowly to the rim of the bowl, whence, falling, it drives the wastes by its *weight* alone, and *not* by its momentum. In falling, the upper flushing stream strikes the curved inner sides of the bowl just above the neck.

[1] Continued from page 235, No. 412.

This destroys whatever momentum the water would acquire in falling from the rim of the bowl, and acts still further as a sound deadener.

(*b*) "The flushing should begin to act *instantaneously* upon operating the pull."

It will be seen from the drawing that the supply-pipe is sealed at the top by the valve, and has no opening except at the bottom beneath the normal level of the water standing in the bowl. For the upper flush the supply does not enter in the usual manner at the top of the bowl, but descends first below it to a point just below the level of the standing water. Hence when the valve is closed the water is held in the pipe by the pressure of the atmosphere acting upon this water-surface. The supply-pipe thus becomes the inverted bottle previously referred to, and would sustain its water-column open-mouthed, provided the length of the supply-pipe did not exceed thirty-three feet, the limit of the abhorrence of Nature for a vacuum. The pipe being full, the flushing begins to act simultaneously with the opening of the valve, and it is not necessary to hold the pull and wait for water to fall from the top to the bottom of and fill a long supply-pipe.

This same principle of the supply-pipe kept full by atmospheric pressure may be adapted to any water-closet in use, though not formed, as is the one we are describing, with special reference to such a form of supply, by constructing and connecting the pipe as shown in Figure 24. The supply-pipe has here an independent branch for the upper flushing. Both the main pipe and its branch descend below the normal level of the water in the trap. The lower pipe enters the trap anywhere best suited to give a proper direction to the jets, while the upper branch has its bend at the point below which it is desired the water shall never be lowered by siphonage, evaporation, momentum, or any other cause. This figure shows the manner in which the "inverted bottle" or "anti-siphon" supply-pipe might be applied to the "wash-out" or any other form of water-closet having the trap entirely below the standing water in the bowl, as in pan, valve, plunger, and most hopper closets. As here arranged, the branch-pipe is shown continuing up beyond the point of its connection with the flushing-rim of the closet, so that it serves to give an after-flush. The extension upwards fills with water during the flushing, and this water falls into the closet after the valve has been closed to restore what water may have been expelled by momentum or by the siphonage caused by the power of the flush. Figure 25 gives in outline a diagram showing another form of the supply-pipe. A double pipe, or rather two pipes, are here used from the valve to the closet. The larger pipe supplies the lower flush, and the smaller the upper. Both are fed by the same valve. Two independent valves, however, might equally well be used. The upper pipe has a sound-deadening chamber at its bottom, which might be constructed quite independent of the closet-bowl.

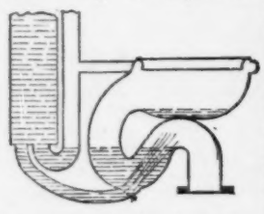


Fig. 24.—Anti-Siphon Supply-Pipe applied to ordinary Closets.

Fig. 25.—Anti-Siphon Supply-Pipe, with two pipes and but one valve.

Figure 26 shows the manner in which the pipe should be constructed when it is desired that it shall hold a very large quantity of water, and have a diameter larger than that of the supply-valve. A special air-pipe is provided in this case; not, however, like the ordinary air-pipe, opening above the tank, but opening below the water in the trap, and directed into it and towards its outflow, so as to aid the water-jets in expelling the wastes. This air-jet serves to allow the air to escape from the top of the supply-pipe as the water enters through the valve. In this manner a supply-pipe of indefinite size may be filled, provided the sectional area of the supply-valve is greater than that of the lower flushing jets.

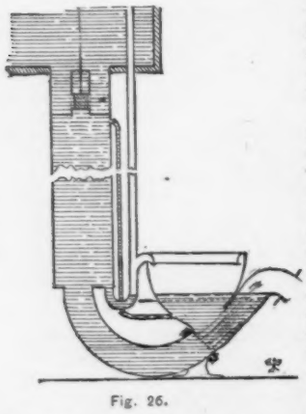
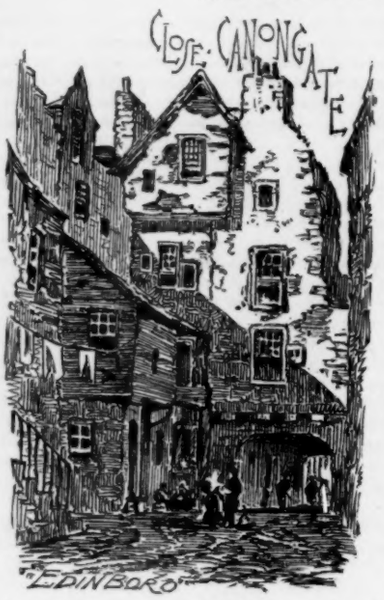


Fig. 26.

The Costly Mormon Temple.—On the ninth of November the main walls of the Mormon Temple were completed. They are ten feet thick, of solid granite, and eighty-five feet high. The foundation was laid twenty-eight years ago. The cost to the present time is $4,500,000. Six years more will be required to complete it.

QUEER CLIENTS.



There are many varieties of the queer client; but the most trying specimen I have met with is the suspicious, inquisitive client, with a turn for sarcasm and an incurable trick of letter-writing. It has been my hap to have some dealings with a pretty fully blown example of this variety,—a coarse old English gentleman with a very fine estate, a house neither new nor old, a pocket full of money, and a taste for building. He was, when in his prime, seldom without some building enterprise on hand, and in a chronic state of excitement and complaint.

It is a good many years since he invited me to run down into Norsex and advise him between the remodelling of his house and building a new one. I discovered afterwards that this was mere playfulness on his part, for he never took any one's advice on any subject. His estate lay in a somewhat low, damp, and malarious part of the country; and he lived all the year round upon his estate like an ideal landlord. Some of his tenants had doubts as to the advantage of this trait, and I have heard them express such with a good deal of point and earnestness. My concern, however, is with the house, which had been built some half-century or more, in a kind of bastard Tudor. The fabric was of brick, and what were supposed then to be Gothic features essential to the style, such as crocketed pinnacles, finials, cusped window-heads, twisted chimney-shafts, four-centred arches with foliated spandrels, and the like, had been distributed with a liberal hand. They were all in compo, after the fashion of the time, and the mouldings had dropped off here and there. The richly-traceried parapets showed their brick core in unsightly scabs and patches; modern cowls, black, varied, and hideous, vulgarized the sky-line, and the dampness of the situation had stained the walls a dirty green, and covered them with an unwholesome parasitic vegetation. The lodges were of the same character, only worse. The drippings of the surrounding trees had rendered them and the almost empty stables forlorn and dispiriting to a degree.

You entered through a sort of groined *porte cochère*, and by way of a vestibule (the windows of which were filled with detestable stained-glass in the vilest taste) into the great hall, dark and gloomy, with sham oak ceilings and fittings. The walls were covered with arms and armor (from Wardour Street) where they did not exhibit tomahawks and the other cheerful implements of savage warfare. Your footfall woke distant and fear-inspiring echoes,—dying away in endless reverberations down long passages all groined in plaster. The principal corridor was decorated in vermilion, green, ultramarine, white and yellow ochre (not gold), in exact imitation, it was said, of the Chapel of St. Francis at Assisi, not very homely in effect,—an altogether uncanny and uncomfortable sort of embellishment for the place. Of the internal joinery, it is impossible to speak with patience. The object of the designer appears to have been to carry the idea of mediæval warfare through all the articles of domestic use; and in some fatal moment a whilom owner had furnished the whole house *en suite* in the Gothic taste, to match the architecture!

Not being at that stage of the proceedings aware of the idiosyncrasy of my client, who had apparently been hitherto infamously treated by every one he had employed, I advised a new house on a more advantageous site, and I was at once directed to prepare plans for adapting the old one. The only pretty, and, indeed, passable portion of the structure was the original cottage, to which the larger house had been added piecemeal. This I wished to preserve. It had no pretensions to architecture; but it had a veranda on two sides of tree branches and trunks, prettily shrouded in climbing roses and creepers, and it had a picturesque thatched roof, with a snug dormer or two peeping out of it. I thought that with some internal alterations it might be made an agreeable change from the solemnities of the sham Gothic of the house, and a pleasant escape from its stately rooms and galleries. It was, of course, ordered to be destroyed.

I prepared two schemes,—one which was a mere extension of the existing house, the new portion to resemble the old, and the old to be renovated; and another scheme, in which the body of the old house was used as a sort of stock whereon to engraft such features of domestic Gothic as were then thought to be "your only wear." The two schemes were submitted to the reversioner, for it was probable that, in the natural course of things, the property must before many years change hands. He decided unhesitatingly for the latter scheme,

and I was accordingly instructed to push on with the *former* without delay.

A poor man cannot afford to pick and choose, and I set to work. 'Twere long to tell of the fights over small things which accompanied the preparation and passing of the plans. When I had thoroughly grasped my friend's character, it was quite easy to obtain black by electing for white. But my complete knowledge of his little ways came too late, — not until I had lost all interest in the matter and desired only to get the affair well out of hand. The contract was signed and the work commenced, and then the real troubles began. It is not difficult for two people to get on together when one of them is deliberately and persistently complaisant. But with the introduction of a third person, — the builder, — the sweet simplicity of this arrangement was upset. Builders are men, and not only men, but generally manly, and they resent any treatment which is based upon the assumption that they are unprincipled sneaks.

My client was excited by a builder as a terrier is by a rat. He never left the spot. Not he! He was on the works the first thing in the morning, — or spying at them through his dressing-room window, — and he smoked his afternoon cigar when the men had gone home, as he perambulated the walls, kicking off a loose brick here, and probing into the work with his walking-stick to test the bond. The workmen swore roundly at these evidences of his interest in their labors. The mortar had no chance of getting mixed in other than the prescribed proportions, — and never was any builder so worried in the matter of the exhibition of vouchers for the integrity of all his materials.

As time wore on every one got sore and everything went wrong. My client conformed to the professional etiquette in so far that he preferred all his complaints against the builder through me. And I am bound to say that he apprised me very frankly of all my own shortcomings.

And now came out a curious part of his character.

He had a knack of writing short sarcastic notes ascribing every commercial vice to the builder and his myrmidons, and by implication, — and even sometimes directly, — the grossest carelessness or incompetence, or both, to myself. At first I was, in my innocence, almost frightened at the gravity and seriousness of his passionate expostulation. But upon running down with all speed to explain or correct what was wrong I was, to my amazement, received with open arms. The causes of complaint were avoided or evaded or made light of. I was "put up" with ceremonious politeness, — marked attentions were showered upon me. Port of special quality, with a recondite history, was produced for my gratification, though I am far from curious in such things. And I was dismissed with presents of rare fruit or what not, and sent on my way in a carriage and pair rejoicing to find on my return, or soon after, another letter full of bitter complainings and taunts.

It was of no use to reply by letters, they were left unnoticed, and every post brought only new grievances. The builder also made me the medium of copious and not ill-founded charges against his employer, — long stories of unwarranted suspicions, and all manner of meanness and injustice.

Driven to desperation, I sent in a request to be relieved from a position which had become intolerable, and I was besought to reconsider my resolution; and so matters dragged on. I was not reconciled to the eccentricities of my client, but I grew callous, and my only hope was a speedy and decent termination to my miseries.

The "extras" which rose under a system of constant interference were, as may be supposed, considerable. This afforded my client a fine opportunity for the exercise of his peculiar talent. Letters of unusual length and concentrated bitterness traversed every item in the bill, and brought counter-charges of all kinds. The builder's courage gave way under the violence of the attack, and he declined to face his employer, except with the support of my presence. A meeting was arranged and we made up our minds for a warm day. We were received at the Hall at lunch time, and found a repast awaiting us fit for a prince. My client put off a discussion of the question which had brought us together. At the end of a pleasant and chatty meal, he placed an envelope in the builder's hand, and bidding him good-day, threaded his arm in mine, and drew me aside into his library. He wished to take my advice about some further work. . . .

Passing through the nearest town on my way to the station, I saw the builder "hanging about" to waylay me *en route*. He looked distraught, and had evidently something of moment to impart. The envelope, it transpired, contained a check for the full amount of his charge, and another £100, "as a consolation for any little extra trouble he had been put to." My own account was paid in due course without cavil, and with a good grace.

But bad times came. The tenants could not pay their rents, farms were vacant on every side, the projected additional work was postponed and finally abandoned, and I was thus relieved from any further concern about the peculiar ways of my very queerest client.

AN URBAN UMBRELLA. — Two German lunatics have sent to the municipality of Buenos Ayres a proposition to cover the city with an umbrella: the base to be 670 feet in diameter, and the height 1520 feet; the ribs to be of cast-iron, and the lining of wrought-iron, and, when hoisted, the umbrella will be over a mile and a half wide; and around it to be a canal to convey the water into the river Plate. They ask $5,750,000 for the little job, and propose to complete it within thirty months.

INCOMBUSTIBLE HOUSES.

THE architect to the municipality of Verdun, M. P. Chevenier, has contributed to the *Génie Civil* a paper on the incombustibility of buildings, which, although more particularly relating to the large Continental house, containing *appartements* on the several floors, nevertheless gives some general advice for the arrangement of buildings so as to prevent fires from attaining unmanageable proportions. He is of opinion that, until preparations for rendering materials incombustible have stood the test of time, their use should only be resorted to by way of additional precaution, while the buildings themselves should be so constructed that any fire which may happen to break out would be confined within very narrow limits.

The piers that support the principal parts of the structure should be built of such materials as stand heat well without appreciable alteration of form; and preference is given to sandstone, millstone, grit, flint and granite, the joints being made with argillaceous cements like those of Portland. The main portions of the internal walls should be built of similar materials, or, at any rate, faced with them. As regards the exterior, it will be sufficient to face the lintels and jambs of the windows, which are specially liable to be licked by flames.

Indeed, as a rule, the framework of all openings, both in the interior and exterior, is more exposed than the intermediate portions, and should therefore be better protected. When, on account of the design, the walls of the façades cannot be well stayed with masonry, they should be tied by iron rods let into the floors, or by anchors attached to the ends of the main girders. In this manner, walls standing alone for a great height are prevented from twisting, and are exposed to the action of the heat on one of their faces only.

The best way to insure the stability of a building under the influence of fire is to keep the floors from giving way. This is easy enough when they are of iron and pugging, but requires special precautions when they are made of combustible materials. MM. Flachat and Noisette have come to the conclusion that a half-inch layer of asphalt over an inch of argillaceous earth is sufficient to protect a floor, both at top and bottom, in the event of a fire occurring, and this system is carried out at the fodder-lofts of the Paris General Omnibus Company. A layer of plaster-of-Paris, fine concrete, cement, or clay, 3 or 4 millimetres (0.11 to 0.15 inch) thick, or a paving of tiles, permits of waiting for assistance, by preventing the air from coming in contact with the wood, and thus maintaining combustion.

The ceilings should be thick and laid on wire gauze, to the exclusion of laths; and channels in them should be botched with clay, small twigs, and chopped hay. Similar precautions should be taken with the roofs between the rafters, thus insuring tightness, a conservation of heat, and a diminution of danger from fire. The simplest arrangement consists of a rough ceiling of plaster and argillaceous sand on wire-gauze nailed under the rafters, and a planking with closed joints under the roofing proper, which should be incombustible, and consist of slates, tiles, or sheet metal.

In the case of iron floors being adopted, the parquetry should be laid on pitch or cement, and special precautions should naturally be taken with the grates and chimneys.

As the floors are supposed to be incombustible, the fire can only extend from story to story by the staircase, which must, therefore, be isolated from the rest of the building. The well should be surrounded by thick walls capable of arresting the flames, and the landings should be flagged and arched or constructed of iron and concrete. The notch-board may be of iron or stone, and the steps of cast-iron and tiles, or even of wood set in cement. In this latter case the wood does not easily catch fire, as the air can only get to the upper surface. There should be incombustible and almost hermetically tight appliances for closing all openings from the several landings. Thus doors of thin sheet-iron with wrought-iron frames may be employed, or the doors may consist of two faces of wood-work with a sheet of iron between. The top of the well should be closed in by wrought-iron and bricks that stand the fire well, and the staircase windows should be made incombustible by means of metal frames and mica panes.

The outside windows of the edifice may be provided with Venetian blinds of iron, rolling-blinds of wire-gauze, or iron shutters, to be closed in the event of danger threatening. To prevent the fire from spreading by the roof, it may be broken by transverse gables at intervals; and the use of combustible materials in all projecting ornamentation is to be avoided.

In conclusion, M. Chevenier does not consider it indispensable that all the materials of a house should be incombustible or non-inflammable, but he contends that the carcass of the house should be built in such a manner as to localize the fire, and, to insure this, it will be sufficient to adopt the measures named above. This does not prevent the use of materials, such as the roofing-timber, for instance, from being rendered incombustible by any of the various processes for this purpose.

WROUGHT-IRON CHIMNEYS.

Steelton, Pa., November 16, 1883.

To the Editors of the American Architect: —

Dear Sirs,— Replying to your favor of 3d inst. beg to say that we have several wrought-iron chimney-stacks, and find them durable and economical. We have them in use as follows: —

Blast-Furnace No. 2, Whitwell Stove stack, 6′ 6″ diameter, 165′ high, lined with 9″ fire-brick for thirty feet, 4″ red brick for 135 feet. Erected 1877.

O. H. Furnace stack, diameter, 7′; height, 135′; lined same as above. Erected 1880.

Rail Mill boiler-stack, No. 2, 6′ diameter, 112′ high. Erected 1881.

Whitwell Stove stack, 6′ 6″ diameter; height, 170′; lined same as above. Erected 1881.

Forge boiler-stack, 7′ diameter, inside shell lined with 9″ fire-brick for 30 feet, then 4″ red brick to top, 110′ high from base plate. Erected 1869.

Rail Mill boiler-stack, 7′ diameter, 110′ high, lined as above. Erected 1874.

Rail Mill gas-furnace stack, same as Rail Mill boiler-stack. Erected 1875.

Rail Mill gas-furnace stack, same as Rail Mill. Erected 1876.

Hoping the enclosed descriptions will prove satisfactory, I remain,

Yours truly, L. S. Bent, Supt.

[As no one seemed to be in possession of the information asked for by Mr. Bancroft in our issue for September 22, we have obtained the foregoing data from the Pennsylvania Steel Co. — Eds. American Architect.]

A PROFESSIONAL VIEW OF THE EXPLORATIONS AT ASSOS.

To the Editors of the American Architect: —

Dear Sirs, — The conference of the Archæological Institute, on October 31st, first drew public attention to the important work accomplished by Messrs. Clarke and Bacon in the last year of their exploration at Assos. Indeed, the uncovering and complete technical restoration of this Greek provincial city, which maintained a consistent architectural character from archaic times down to the Byzantine era, is an event of first-rate importance, not only to archæology, but to the practice of architecture. It is not denied by any school of architecture that a knowledge of the fundamental principles of Greek art is the proper basis of professional training. Greek forms and Greek principles are therefore instilled into the mind of the student with the object of purifying the sources of expression by a familiarity with the highest type of architectural form yet exhibited in the history of art. This instruction is conveyed by text-books setting forth the details of the greatest monuments of the style,— the temples and other solemn and ceremonious hieratic forms, in which the spirit of this fortunate people is shown at its most exalted point of expression. Comparatively few, if any, intimations of their style of work in structures of minor importance, in domestic buildings, for example, in baths, stoas, market-places, tombs, theatres, fortified walls and bridges, have been accessible; for the Greek element at Pompeii was a sophisticated exotic in a strange land, and carried with it too many reminiscences of Roman influence to fairly express the forms which pure Greek art would assume in its unguarded and more playful moments. For the want of such accessible illustrations of its copiousness and elasticity, the Greek spirit has been apt to assume in the minds of students an aspect of remoteness from common sympathy and use; and thus its true function in purifying and refining the practical work of design has fallen short of fulfilment. The publication of Stuart and Revett's "*Antiquities of Athens*" tended in the early part of the century to stiffen and freeze the sources of design and to encourage base imitation. The Greek idea was formulated and made to do cold service in the hands of ignorant builders. The influence of Pompeii in a later day was in the direction of license; but now, when architecture seems to have degenerated — at least in the hands of English-speaking people — into a series of archæological revivals, and the modern spirit, embarrassed by its huge inheritance of precedent, seems especially to need the chastisement and correction of high artistic principles of design, I am persuaded that a fuller illustration of the capacity of Greek art will go farther to accomplish this result than any other influence which can be brought to bear upon the profession.

Assos, revived, as it were, by the indomitable diligence and honest scientific methods of these young Americans, by Clarke's archæological learning, and by Bacon's elegant and conscientious draughtsmanship, will, we are told, present to us a picture of Greek life at least as complete as that of Roman life in the remains of Pompeii and Herculaneum. It will exhibit the true Greek spirit, not in its sublime or heroic mood, but still Greek, even in the homely life of a little provincial seaport,— pure Greek, even after the dominant Roman had invaded it with his conquering arch. The early builders of Assos were among those who first gave distinctive Greek form to the archaic traditions of Mesopotamia, and their descendants kept the advancing type pure from all Western alloys at least down to the third century of the Christian era. This little town was thus apparently virgin Greek for eight or nine centuries, and, in its monuments, presents the history of a consistent growth towards the civilization which was consummated in Attica. We shall here see the whole process of the development of Greek ideas; we shall see the architects experimenting with forms, inventing freely, playing with *motifs*, all in a very modern fashion, but never ceasing to be Greek. Thus, as it seems to me, this artistic and fructifying spirit is to receive a largeness of illustration which was not anticipated by those who forwarded, conceived and carried on these curious investigations, and which cannot fail to interest the architect, and to awaken his artistic sense. The fecundity of design, especially as exhibited in the streets of tombs, is an unexpected quality in Greek art and one which cannot fail to commend it anew to the student and bring it nearer to his sympathies. By the accident of fashion or by some unexplained process of evolution, modern practice seems to me rapidly approaching the moment when such a new dispensation of forms will be apt to exercise upon it a marked and wholesome influence, and perhaps to turn it towards the formation of a new school, a reformation, indeed, far better suited to our civilization than any mere revivals, however romantic or picturesque.

For these reasons it is especially incumbent upon the profession to do all in its power to forward the speedy and fitting publication of the results of these interesting researches. It is no mere archæological or antiquarian interest which concerns us, but the propagation of a purer and more prolific principle of design. Funds are urgently needed to procure the fulfilment of this promise and to make available to all the studies of Assos. There is every reason why American architects should not hold aloof from such a cause.

Henry Van Brunt.

PARGETING.

November 12, 1883.

To the Editors of the American Architect: —

Dear Sirs, — Please inform me through your journal, of the composition of the plaster for pargeting, and its merits as compared with ordinary mortar? Very truly yours, T.

[Pargeting usually means the lining of chimney-flues with a coat of mortar, and the mortar used is simply that with which the chimney is built. — Eds. American Architect.]

MACHINE SHOPS AND FOUNDRIES.

Chicago, November 9, 1883.

To the Editors of the American Architect: —

Gentlemen, — Oblige me with the information of whom illustrations, plans, etc., can be obtained for the most recently constructed machine-shops, foundries, and forge establishments. Is there any publication devoted to this branch of building or any making a special department of such?

I am a subscriber to your journal but do not find any articles on this subject. Very truly, W. H. Banks.

[We know of no publication of the kind referred to, but perhaps some suggestions could be obtained from the "*Journal of the Iron and Steel Institute*, published by E. & F. N. Spon, New York. The proprietors of the best foundries and machine-shops are not generally disposed to have their arrangements made known. — Eds. American Architect.]

NOTES AND CLIPPINGS.

Bridge Travel in London. — Proposals having been made for building a new bridge over the Thames, statistics have been collected to show the amount of travel over the present bridges. The following table shows the average daily travel over a few of the principal bridges:

London	110,525	pedestrians,	22,242	vehicles.
Black Friar's	79,198	"	13,875	"
Westminster	44,460	"	11,750	"
Waterloo	32,815	"	10,370	"
Southwark	25,507	"	3,340	"
Vauxhall	17,828	"	5,453	"
Charing Cross	16,130	"		
Chelsea	14,500	"	2,338	"
Battersea	10,260	"	1,342	"

The addition of the other bridges gives a total of 384,042 pedestrians, and 75,325 vehicles. — *Dingler's Journal.*

The Yellowstone Paint Pots. — Leaving the Minute Man and pushing on a a few miles we were induced, in obedience to a finger-post, to make a détour to the left of about half a mile and visit the "Paint Pots." These are situated in a pretty piece of fir timber, the approach of the pedestrian being over a sward of soft green moss and ferns, as picturesque as any spot upon the Wissahickon. The guide-book (evidently written by a tourist in a hurry) slights this exquisite bit of nature with the paragraph: "The Paint Pots are very fine and of different colors." I should think they were very fine! Let me try to describe them. From the base of a little hill spout three or four tiny fountains of hot water, and this water brings with it a variety of minerals in solution, which it deposits upon the half-acre upon which it thinly and slowly distributes itself. With a piece of stick I transferred from these little streams to a visiting card fifteen distinct and separate colors of brilliant hue, intending to carry them home with me, but, unfortunately, exposure to the air converted them to powder and they have disappeared, leaving nothing but a few stains upon the pasteboard. They consisted of vermilion, lake, pomegranate, brick-red, crushed-cherry, pink, white, madder-brown, purple, *cafe au lait*, green, orange, yellow, straw and mauve. Of blue I could not find a trace, and yet nature, apparently aware of this omission, had filled the basins of these miniature geysers with water so clear that the reflection of the heavens gave them a beautiful azure tint. To me this was one of the choicest treats of my visit, but, as I said before, I had no notion of the effects which could be produced by coloring until then. — *Cor. Philadelphia Press.*

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.]

288,200. PLASTERING. — Hiram Bissell, Hartford, Conn.

288,207. AWNING. — Adoniram J. Chandler, Fern Bank, O.

288,212. FIRE-PROOF SHUTTER. — John T. Cowles, Chicago, Ill.

288,226. ONE-HAND PLANE. — Lorenzo G. Gilson, Fort Scott, Kans.

288,235. ATTACHMENT TO DIVIDERS. — Hermann Hanstein, Chicago, Ill.

288,262. COMPOSITION TO BE USED IN THE MANUFACTURE OF ARTIFICIAL STONE. — James L. Rowland, New York, N. Y.

288,269. FIRE AND WATER PROOF PAINT. — David H. Smith, Mishawaka, Ind.

288,273. SASH-HOLDER. — Charles E. Steller, Milwaukee, Wis.

288,282. WINDOW-SCREEN. — Jas. Watson, Marinette, Wis.

288,304. FIRE-ESCAPE. — Jesse H. Burks, Los Angeles, Cal.

288,307. ADJUSTABLE EAVES-TROUGH BRACKET. Franklin P. Campbell, Bloomfield, N. J.

288,325. SAFETY DEVICE FOR ELEVATORS. — Oliver B. Gaston, Elizabeth, N. J.

288,332. APARTMENT-HOUSE. — Elias T. Hatch, New York, N. Y.

288,334. FAUCET. — William H. Hedges, Newark, N. J.

288,338. SHEAVE FOR SLIDING-DOORS. — Samuel Herbert Houghton, Harvard, Mass.

288,345. LOCK-HINGE. — John A. Kline, Royer's Ford, Pa.

288,347. BRICK-KILN. — Henry Konhorst, Henderson, Ky.

288,352. FOLLOWER FOR RAM-ELEVATORS. — William R. Low, San Francisco, Cal.

288,354. CYCLONE-REFUGE. — John N. Mileham, Jersey City, N. J.

288,376. SAW-CLAMP. — Geo. N. Stearns, Syracuse, N. Y.

288,383. ELEVATOR-GATE. — Benjamin C. Van Duzen, Cincinnati, O.

288,394. INCLINE-PLANE FIRE-ESCAPE. — Ezra H. Bailey, Washington, D. C.

288,403. BORING-MACHINE. — Hibbard T. Bowen, Philadelphia, Pa.

288,411. FIRE-ESCAPE. — Chas. Connolly, Turners Falls, Mass.

288,432. WRENCH. — James M. Harland, Dayton, O.

288,438. VISE. — John W. Hudson, Wellington, Ill.

288,447. FIRE-ESCAPE. — Thomas K. Keith and Roswell Carleton, Haverhill, Mass.

288,448. FIRE-ESCAPE. — James Kennedy, Strabane, County of Tyrone, Ireland.

288,453. FABRIC FOR VENEERS. — Frederick Koskul, St. Louis, Mo.

288,455. FOLDING-LADDER. — John K. Landes, Caledonia, O.

288,466. KILN FOR BURNING BRICK, TILES, ETC. — Henry McCue, St. Louis, Mo.

288,498. ROOFING-TONGS. — Theodore Schwarz, Sedalia, Mo.

288,512. KNOB-LOCK. — Le Grand Terry, Horseheads, N. Y.

288,535. VENTILATING-SKYLIGHT. — Chester L. Williams, New York, N. Y.

288,549. BENCH-VISE. — William H. Cloud, Detroit, Mich.

288,564. VENTILATOR. — Robert Foulsham, Boston, Mass.

288,570. ELECTRIC HOTEL-ANNUNCIATOR AND FIRE-ALARM. — Albert T. Hess, Des Moines, Iowa.

288,571–572. — VAULT-COVER OR ILLUMINATING GRATING-TILE AND SURFACE MADE THEREOF. — Thaddeus Hyatt, New York, N. Y.

288,573. MEANS FOR PRESERVING THE SEAL IN TRAPS OF WATER-CLOSETS, URINALS, WASH-BASINS, SINKS, ETC. — James P. Hyde, New York, N. Y.

SUMMARY OF THE WEEK.

Atlanta, Ga.

CHAMBER OF COMMERCE. — Five-st'y brick and granite building, 52′ x 120′, cor. Pryor and Hunter Sts.; cost, $50,000; Fay & Eichberg, architects.

OFFICE-BUILDING. — The "Constitution" Publishing Company, office-building, 58′ x 100′, cor. Alabama and Forsyth Sts.; day labor; Kimball, Wheeler & Co., architects.

CLUB-HOUSE. — Lee Smith, three-st'y brick and stone club-house, 25′ x 50′, Wall St.; cost, $15,000; Fay & Eichberg, architects.

STORE. — Williams Estate, three-st'y iron, brick and stone store, 30′ x 110′, Peachtree St.; cost, $8,000; Fay & Eichberg, architects.

DWELLINGS. — R. H. Richards, three-st'y brick dwell., terra-cotta finish, Peachtree St.; cost, $20,000; Humphries & Norman, architects.

Isaac May, three-st'y brick and stone dwell., cor. Washington and Crumley Sts.; cost, $18,000; Fay & Eichberg, architects.

C. W. Hunnicutt, two-st'y frame dwell., West Peachtree St.; cost, $20,000; Fay & Eichberg, architects.

W. B. Lowe, frame dwell.; cost, $10,000; Bruce & Morgan, architects.

A. B. Steele, two-st'y frame dwell., Peachtree St.; cost, $5,000; Fay & Eichberg, architects.

Mrs. Walter Gordon, 2 frame cottages, Peachtree St.; cost, $3,000; E. G. Lind, architect.

RECTORY. — Rectory for Church of the Immaculate Conception, two st'y, brick and stone, cor. Pryor and Hunter Sts.; cost, $8,000; Fay & Eichberg, architects.

Baltimore.

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

Michael Wright & Co., two-st'y brick building, in rear of n w cor. Druid Hill Ave. and Wilson St.

Hanline Bros., two-st'y brick building, e s Dallas St., between Eastern and Canton Aves.

G. & W. Klein, 2 two-st'y brick buildings, s s Randall St., w of Patapsco St.

L. C. Smith, 3 two-st'y brick buildings, s s Randall St., w of Patapsco St.

August Hannemann, 4 two-st'y brick buildings, n e cor. Jefferson St. and Madeira Alley.

W. L. Elliott, 3 three-st'y brick buildings, w s Mount St., n of Lexington St., and 3 two-st'y brick buildings in rear, e s Bruce Alley.

Henry Bushman, three-st'y brick building, n s Lexington St., between Howard and Park Sts.

Alex. M. Briscoe, two-st'y brick building, w s Gilmor St.; n of McHenry St.

John Stack, 2 three-st'y brick buildings, s e cor. Harlem Ave. and Schroeder St.

John Kern, Jr. & Co., one-st'y brick building, 33′ x 90′, s w cor. Cross and Wicomico Sts.

Boston.

BUILDING PERMITS. — *Brick.* — *Appleton St.*, near Berkeley St., Ward 16, for Albion Knowlton, tenement, 24′ 6″ x 56′, four-st'y flat; M. McLaughlin, builder.

Wood. — *Charles St.*, rear, near Dorchester Ave., Ward 24, for B. D. McDonald, stable, 18′ x 20′, one-st'y pitch.

Cheney St., near Blue Hill Ave., Ward 21, for Edward Reynolds, stable and carriage-house, 25′ x 50′, two-st'y flat; Joseph A. Hayford, builder.

Moreland St., cor. Blue Hill Ave., Ward 21, for Samuel Weld, 2 dwells., 23′ 6″ x 50′, two-st'y hip; J. H. Burt & Co., builders.

Clifton Ave., cor. Clifton St., Ward 20, for Joseph Breckenbridge, 4 dwells., 30′ x 36′, two-st'y pitch; Hamilton & Parks, builders.

Wheatland Ave., rear, near Washington St., Ward 24, for John Galvin, greenhouse, 15′ x 98′, one-st'y pitch; Joseph P. Shaw, builder.

Vaughan Ave., near Geneva Ave., Ward 24, for Charles Chambers, dwell., 22′ x 31′, two-st'y pitch.

Warren St., cor. Holborn St., Ward 21, for S. F. Rowe, dwell., 17′ x 24′ and 32′ x 41′, two-st'y pitch; E. F. Brown, builder.

Boylston St., rear, Ward 23, for Abraham Bell, stable, 18′ x 24′, one-st'y pitch.

Mulvey Ave., rear 106 Heath St., Ward 22, for John B. Mulvey, 2 dwells., 20′ x 32′, three-st'y flat; Geo. Giggie, builder.

Ruggles St., Nos. 24 and 26, Ward 19, for Simon Goldsmith, 2 dwells., 20′ x 45′, three-st'y flat.

Heath St., near Walden St., Ward 22, for Abraham F. Rogers, dwell., 22′ x 37′, three-st'y hip.

Meridian St., cor. Falcon St., Ward 1, Timothy McCarty, 2 dwells., 20′ x 38′ 6″, three-st'y flat; Herman Drake, builder.

H St., Nos. 157 and 159, Ward 14, for Mrs. Julia W. Howe, 2 dwells., 20′ x 34′, two-st'y flat; Holbrook & Harlow, builders.

Brooklyn.

BUILDING PERMITS. — *Seventh Ave.*, e s, 50′ s Thirty-ninth St., two-st'y frame tenement, tin roof; cost, $600; owner and builder, William Cullen, Seventh Ave., cor. Thirty-ninth St.; architect, S. B. Bogert.

Broadway, w s, 126′ n Stockton St., three-st'y brick store and tenement, tin roof; cost, $8,000; owner, architect and builder, Jno. G. Porter, 405 Pearl St., New York City.

Palmetto St., No. 76, n e s, 300′ from Bushwick Ave., two-st'y frame dwell., tin roof; cost, $2,400; owner and builder, Andrew Walker, 106 Palmetto St.

Carroll St., s s, 126′ w Seventh Ave., 8 three-st'y brownstone front dwells., tin roofs; iron cornices; cost, each, $7,000; owner, Thos. Reid, 20 Nassau St., New York City; architect, H. J. Farquhar; builder, E. T. Rutan.

Carroll St., s s, 240′ w Fifth Ave., three-st'y brick tenement, tin roof; cost, $3,000; owner, M. E. Lynch, 365 Bedford Ave.; architect, I. D. Reynolds.

Withers St., s s, 147′ w Graham Ave., three-st'y frame double tenement, tin roof; cost, $4,000; owner and builder, M. Kronheim, on premises.

Suydam St., Nos. 23 and 25, n s, 225′ e Broadway, 2 two-st'y frame tenements, tin roofs; cost, each, $3,000; owner and builder, Geo. Doering, 27 McKibben St.; architect, T. Engelhardt.

Park Ave., n s, 100′ w Marcy Ave., 2 three-st'y frame tenements, one to have store, tin roofs; cost, each, $4,000; owner, Caspar Brecht, 222 Ellery St.; architect, T. Engelhardt; builders, J. Rueger and H. Bruchhaeuser.

Eighteenth St., No. 359, n s, 75′ from Seventh Ave., three-st'y frame tenement, tin roof; cost, $3,000; owner and architect, J. H. or I. H. Herbert, 116 Gates Ave.; builders, P. McCoppen and P. Hughes.

Prospect St., n s, 83′ w Bremen St., 2 one-st'y buildings, gravel roofs; cost, $8,000; owners, Obermeier & Liebmann, Bremen St.; architect, Th. Engelhardt.

State St., n s, 20′ e Nevins St., three-st'y brick dwell., gravel roof; cost, $5,000; owner and builder, John Demott; architect, Joseph Platt.

Clifton Pl., s w cor. Nostrand Ave., 10 two-st'y and three-st'y brown stone front dwells., tin roofs; cost, each, $7,000; owner, Jas. R. Robbins, 363 Nostrand Ave.; architect and builder, Geo. Burton.

Lafayette Pl., s s 210′ e Broadway, two-st'y frame dwell., tin roof; cost, $3,000; owner, Anna A. Fardon, 119 Carlton Ave.; architect and builder, A. A. Fardon.

Prospect Ave., s s, 60′ e Eleventh Ave., one-st'y frame enclosed shed, gravel roof; cost, $4,000; owner, Thos. McCann, 853 Douglass St.; architect, Peter Graham.

Prospect Ave., n s, 120′ e Eleventh Ave., one-st'y frame enclosed shed, gravel roof; cost, $4,000; owner, etc., same as last.

Union Ave., w s, 100′ n Withers St., 2 two-st'y frame dwells., tar and gravel roofs; cost, each, $1,000; owner, Wm. Coit, 77 First Pl.; builder, E. A. Willoughby.

ALTERATION. — *Union St.*, s s, 125′ e Nevins St., brick factory raised one-st'y, gravel roof; cost, $2,500; owners, Kenyon & Newton, 528 Union St.

Chicago.

BANK-AND-OFFICE-BUILDING. — G. H. Edbrooke is architect of the bank-and-office-building for Cooper & Carson, on Dearborn St., near Monroe St., 100′ x 131′, eight-st'y and basement, first-st'y brownstone, upper stories Anderson pressed-brick; cost, $200,000.

FLATS. — G. H. Edbrooke, architect, planned the flats for J. D. Fanning, on Indiana St., 30′ x 75′, four-st'y, Anderson pressed-brick; cost, $14,000.

WAREHOUSE. — G. H. Edbrooke, architect, planned the warehouse for Hiram Sibley, Clark St., cor. North Water St. and the River, 200′ x 240′, nine-st'y high, one of the heaviest buildings in the West; each floor will be capable of holding a weight of 500 pounds to the square foot; cost, $500,000.

BUILDING PERMITS. — E. Ambronstes, two-st'y flats, 591 West Harrison St.; cost, $5,000; architect, F. Kettenich; builder, J. W. C. Neff.

H. F. Waite, three-st'y flats, 2130 Butterfield St.; cost, $3,000: architect, W. H. Drake; builder, A. J. Halberg.

H. F. Waite, three-st'y flats, 2131 South Clark St.; cost, $3,000; architect, W. H. Drake; builder, A. J. Halberg.

B. Lewis, two-st'y store and dwell., 235 Thirteenth Place St.; cost, $3,500; architect, F. Kettenich; builders, Edward & Holman.

J. Woodward, three-st'y flats, Thirty-third St.; cost, $9,000; architects, Dixon & Townsend; builder, Wm. Freund.

Frank Novatny, three-st'y store and flats, 585 and 587 Centre Ave.; cost, $21,000; architect, J. Whitner.

Frank Ammonn, three-st'y flats, 1045 North Clark St.: cost, $8,000; architect, J. Karis; builders, Hansen & Anderson.

E. F. Dunn, 4 two-st'y stores and dwells., 705 to 709 Madison St.; cost, $9,000; architect, J. J. Egan; builder, T. C. Nagle.

C. F. Gray, two-st'y store and dwell., 392 Wells St.; cost, $6,000; architect, H. Surks.

C. H. Slack, two-st'y barn, 395 West Adams St.; cost, $3,000.

A. J. Cooper & J. D. Carson, eight-st'y office and bank-building, Dearborn St., near Monroe St.; cost, $200,000; architect, G. H. Edbrooke.

John Smith, 20 two-st'y and cellar dwells., 196 to 224½ Warren Ave.; cost, $90,000; architect, W. A. Furber; builder, W. J. Waddell.

O. M. Sheldon, three-st'y and cellar dwell., 42 Douglas Ave.; cost, $6,000; architect, W. A. Furber; builder, J. Griffiths.

Mrs. S. Glade, 2 two-st'y flats, 659 and 661 Robey St.; cost, $7,000; architects, Frohmann & Gibsen; builder, F. Gottschalk.

John Johnson, two-st'y flats, 541 Leavitt St.; cost, $3,500.

H. M. Hosick, two-st'y and attic dwell., 850 and 852 Park Ave.; cost, $12,000; architect, E. Bauman; builder, C. G. Maller.

L. H. Thairn, three-st'y store and dwell., 218 and 220 West Division St.; cost, $7,500; architect, H. F. Starbuck; builder, Geo. Peterson.

C. D. Mayer, three-st'y dwell., 73 Delaware St.; cost, $6,000; architect, H. M. Hawley.

D. D. Healy, two-st'y dwell., 553 Leavitt St.; cost, $3,200.

O. M. Wells & Co., 6 cottages, 69 to 79 Kendall St.; cost, $7,500.

E. L. Smith, 5 three st'y dwells., Indiana St., cor. Rush St.; cost, $20,000; architects, Cudell & Blumenthal; builders, Willis & Schell.

Streeter & Tucker, 3 three-st'y stores and dwells., 971 to 975 Van Buren St.; cost, $20,000; architects, Wheelock & Clay; builders, W. M. Crilly & Co.

Dr. E. W. Lee, 2 three-st'y flats, 438 and 440 Harrison St.; cost, $12,000; architect, J. R. Willet; builder, W. M. Crilly.

Mrs. L. Johnson, two-st'y store and flats, 484 and 486 Milwaukee Ave.; cost, $15,000; architect, C. Hansen; builders, Vagerlund & Nelson.

H. Goldsmith, four-st'y flats, 240 Indiana St.; cost, $7,000; architect, C. Cobb; builder, J. Blatteau.

J. Manakan, two-st'y flats, 25 and 37 West Division St.; cost, $6,000; builder, F. Hanson.

B. Stein, three-st'y store and dwell., 1029 West Madison St.; cost, $5,600; architect, Wm. Strippleman.

Milwaukee, Wis.

BUILDING PERMITS. — Chris. Templin, dwell. for C. M. Lantry on Nineteenth St., Fourth Ward; cost, $3,000.

Carl Jeske, store for John Helms on Third St., Sixth Ward; cost, $5,000.

New York.

CLUB-HOUSE. — Messrs. Smith, Prodgers & Co. have been appointed contractors for the erection of the New York Athletic Club-House, on the s w cor. of Sixth Ave. and Fifty-fifth St.

STABLE. — For Mr. David B. Fairweather, a three-st'y brick stable, 25′ x 90′, is to be built on the north side of Fifty-seventh St., 150′ e of Lexington Ave.; cost, about $16,000.

STORES. — On the north side of Thirty-fifth St., near Seventh Ave., a six-st'y building, 66′ 8″ x 100′, of stone, brick and terra-cotta, first story to be used for stores, flats above, is to be built for Mrs. Marie L. Olliffe, from designs of Mr. George Edward Harding.

BUILDING PERMITS. — *One Hundred and Thirty-*

fourth St., s s, 100′ w Seventh Ave., 7 three-st'y brick dwells., tin roofs; cost, each, $6,000; owner and architect, Wm. J. Merritt, 118 West One Hundred and Twenty-ninth St.; builders, John Fullam and R. A. Hollister.

East Twenty-fourth St., No. 12, four-st'y brick dwell., tin roof; cost, $25,000; owner, Janet B. Brown, 39 East Twenty-third St.; architect and builder, M. Magrath.

South Fifth Ave., No. 105, five-st'y brick factory, tin roof; cost, $21,000; owner, Cyprien Gousset, 87 South Fifth Ave.; architect, J. M. DuBois; builder, O. E. Perrine.

One Hundred and Forty-sixth St., s s, 104′ w Seventh Ave., one-st'y frame workshop, tin roof; cost, $4,000; owner, Manhattan Railway Co., 71 Broadway; builders, J. W. Close and Meeker & Hedden.

Seventy-ninth St., s s, 41′ w Fourth Ave., 2 four-st'y brick and stone dwells., tin roof: cost, each, $20,000; owner, James V. S. Woolley, 75 East Seventy-ninth St.; architect, Jas. E. Ware.

Seventy-fifth St., s s, cor. Broadway and Tenth Ave., three-st'y brick stable, tin and slate roofs; cost, $60,000; owner, Edward Clark Estate, 25 West Twenty-third St.; architects, Chas. W. Romeyn & Co.

One Hundred and Forty-fifth St., n s, 100′ w Brook Ave., three-st'y frame tenement, tin roof; cost, $5,500; owner, Mary Haffen, One Hundred and Forty-fifth St., cor. Concord Ave.; architect, A. Pfeiffer; builder, Chas. Haffen.

Eighty-second St., n s, 173′ e Ninth Ave., 2 four-st'y brick dwells., tin roofs; cost, each, $25,000; owner and builder, Richard Deeves, 243 East Thirteenth St.; architects, D. & J. Jardine.

Eighth Ave., e s, 80′ n One Hundred and Twenty-ninth St., four-st'y brick tenement, tin roof; cost, $10,000; owners and builders, White & Anderson, 420 East One Hundred and Twentieta St.; architect, John A. Hamilton.

Morris St., n s, 95′ 3″ e Scammel St., running through to Madison St., 8 five-st'y brick tenements and stores, tin roofs; cost, each, $12,000; owner, John J. Macdonald, 1216 Third Ave.; architect, John Brandt.

One Hundredth St., n w cor. Ninth Ave., 4 five-st'y tenements and stores, tin roofs; cost, each, $9,000; owner, Benjamin Wallace, 91 Horatio St.; architect, Samuel Bennett; builders, John Wallace & Co.

Ave. A, No. 1426, five-st'y brick tenement and store, tin roof; cost, $12,000; owner, Francis J. Schnugg, 225 East Tenth St.; architect, J. Kastner; builder, M. H. Schneider.

Railroad Ave., e s, 116′ w One Hundred and Sixty-sixth St., two-st'y brick factory, tin roof; cost, $25,000; owner, Richard Walter, 130 West Fifty-seventh St.; architects, Thom & Wilson; builders, Dawson & Archer and Hollister & Son.

Bulkhead at foot of One Hundred and Twenty-seventh St., Harlem River, two-st'y frame refrigerator-building, tin or slate roof: cost, $6,000; owners, G. F. & E. C. Swift, West Washington Market; architect and builder, B. F. Bailey.

One Hundred and Twenty-ninth St., n s, 425′ w Seventh Ave., 4 three-st'y brick dwells., tin roofs; cost, each, $6,000; owner, architect and builder, Wm. J. Merritt, 118 West One Hundred and Twenty-ninth St.

One Hundred and Thirtieth St., s s, 425′ w Seventh Ave., 4 three-st'y brick dwells., tin roofs; cost, each, $6,000; owner, architect and builder, same as last.

ALTERATIONS. — Plans have been completed for the altering of the premises 58 to 66 Church St., into a fire-proof building for the American Bank Note Company, at a cost of $250,000; Messrs. J. C. Cady & Co., architects; Sinclair & Wills, masons; E. Suedeker, carpenter.

Grand St., No. 490, raise two stories; cost, $2,500; owner, Samuel B. Clark, 496 Grand St.; builders, Thos. Lyons and P. O'Reilly.

Ma ket St., Nos. 26 *and* 28, internal alterations and a three-st'y brick extension; cost, $3,500 each; owner, Aug. Marshall, 242 East Seventy-second St.; architects, A. Pfund & Son.

Pearl St., No. 499, raise attic to full story and a four-st'y brick extension; cost, $4,500; owner, Benj. Sire, 160 Fulton St.; architect, Wm. Graul.

One Hundred and Thirteenth St., s s, 100′ w First Ave., internal alterations; cost, $10,000; owners, John Dwight & Co., 11 Old Slip; architect, Emanuel Gandolfo.

Church St., n w cor. White St., raise one-st'y; cost, $5,000; owners, Wm. W., John and Emma Seymour, Larchmont, N. Y.; builders, Robert L. Darragh & Co.

East Third St., No. 345, raise attic to full story and a three-st'y brick extension; cost, $2,000; owner, Matt Meyer, 349 East Third St.; architect, Wm. Graul.

Commerce St., Nos. 20 *and* 22, repair damage by fire; cost, $2,000; owner, Solon Winterbottom, 51 South Washington Sq.; builder, J. H. Slocum.

Leonard St., Nos. 66, 68, 70 *and* 72, raise a mansard st'y; cost, $15,000; owners, Margaret L. Lee and Henry B. Livingston, Staatsburgh, N. Y.; architect, Arthur Crooks.

Philadelphia.

BUILDING PERMITS.—*Watts St.*, e s, n Federal St., two-st'y dwell., 16′ x 40′: Wm. E. May, owner.

Broad St., bet. Marshall and Elsworth Sts., second and third-st'y addition to building, 20′ x 50′; A. Roelofs.

Ogden St., n s, w Twenty-ninth St., 9 two-st'y dwells., 14′ x 45′; Jos. N. Pattison, contractor.

Wilson St., No. 1026, two-st'y dwell., 15′ x 40′; A. McClay, contractor.

Brooks St., n s, bet. Fifty-fourth and Fifty-fifth Sts., two st'y stable and carriage house, 18′ x 72′; Geo. Brooks & Son, owners.

Franklin St., w s, s Huntingdon St., 3 two-st'y dwells., 14′ x 48′; Jno. Loughran, contractor.

Nineteenth St., w s, s Dickinson St., two-st'y dwell., 14′ x 42′, Jno. S. Benson, contractor.

Randolph St., s w cor. Oxford St., two-st'y dwell., 22′ x 68′; E. Schmidt, contractor.

Moyer St., w s, s Palmer St., four-st'y addition to factory, 22′ x 50′; D. J. Getz, contractor.

Delhi St., No. 2240, two-st'y dwell., 16′ x 45′; D. C. Schuler, contractor.

Germantown Ave., w s, n Berks St., 4 three-st'y stores and dwells., 15′ x 61′; J. A. Riter & Co., contractors.

Watt St., s e cor. McKean St., two-st'y shop, 20′ x 50′; Jacob Botter, owner.

Cypress St., No. 320 four-st'y factory, 19′ x 36′; Thos. Carr, contractor.

Dauphin St., s s, w Germantown Ave., two-st'y dwell., 16′ x 48′; Jos. Lutz, contractor.

Fairhill St., No. 2725, three-st'y dwell., 17′ x 44′; P. L. Stuhlman, owner.

Reese St., No. 2726, two-st'y stable, 16′ x 30′; P. L. Stuhlman, owner.

Jefferson St., n s, e Twenty-second St., two-st'y stable, 51′ x 62′; A. S. McCord, owner.

Mascher St., w s, s Somerset St., one-st'y addition to dye-house, 24′ x 164′; Jos. Hanson, owner.

East Dauphin St., No. 611, three-st'y dwell., 18′ x 45′; Chas. M. Lentz, owner.

Seventeenth St., s Montgomery Ave., 11 three-st'y dwells., 17′ x 60′; Thos. McCouch, contractor.

Twenty-first St., s Reed St., 6 two-st'y dwells., 16′ x 38′; Wm. Forbes, owner.

General Notes.

ALBANY, GA. — Two-st'y frame dwell., for C. W. Tift; cost, $4,000; Humphries & Norman, architects, Atlanta.

BATH, ME.— A residence to cost $10,000 is to be built for Mr. W. H. Swett, from designs of Mr. G. E. Harding, of New York.

BROCKTON, MASS. — Brockton is to have a new theatre. It will be in the brick block now in process of erection at the cor. of Main and Crescent Sts.

CHATTANOOGA, TENN. — Brick Presbyterian church, cost, $20,000; Bruce & Morgan, architects, Atlanta, Ga.

CLEVELAND, O. — A residence for the Hon. S. T. Everett, of Hummelstown, fire-proof, brownstone front, iron roof, is being built at a cost of about $200,000, from designs of Messrs. C. F. & J. A. Schweinfurth.

A residence to cost $14,000, first-story brick and stone, second story shingles, is to be built for Mr. N. S. Possons; Messrs. C. F. & J. A. Schweinfurth, architects.

Residence for W. O. B. Skinner and Mr. H. C. Polt, to cost, $9,000 and $5,000 respectively, are to be built from designs of Messrs. C. F. & J. A Schweinfurth.

CLINTON, IO.— Two-st'y brick and stone house for S. B. Gardner; cost, $20,000; W. W. Sanborn, architect.

For G. M. Custis two-st'y house; cost, $16,000.

EDGEWOOD, GA. — Frame dwell. for Prof. Barilli; cost, $3,000; E. G. Lind, architect, Atlanta.

ENGLEWOOD, ILL.— The house of C. H. Knights was planned by G. H. Edbrooke, of Chicago, Queen Anne style, two-st'y.

FALL RIVER, MASS. — The Fall River *News* says: It is understood that about one-half of the stock of $400,000 has been subscribed toward the erection of a cotton-mill, to be under the direction of Mr. Jas. E. Cunneen.

GAINESVILLE, GA. — Court-house, of brick and stone; cost, $30,000; Bruce & Morgan, architects, Atlanta.

GENEVA, WIS.—G. H. Edbrooke, architect, of Chicago, planned the three buildings at Lake Geneva, to be used for private asylum for care of the insane of Wisconsin; Anderson pressed-brick, interior of hard-wood finish, four-st'y each; cost, $150,000.

KANSAS CITY, MO. — Mr. J. W. Wahlemmaier is building a two-st'y house on Armstrong St., above Wyandotte Ave.

KIRKWOOD, GA. — Presbyterian church; E. G. Lind, architect, Atlanta.

Frame dwell., for Col. Mynatt; cost, $6,000; E. G. Lind, architect, Atlanta.

LAFAYETTE, GA.— Brick court-house; cost, $12,000; Bruce & Morgan, architects, Atlanta.

LITIZ, PA.—Mary Dixon Memorial Chapel (Moravian) to be built of stone, and will cost about $20,000; Willis G. Hale, architect, Philadelphia, Pa.

LONGWOOD, MASS. — A house and stable are being built for Mr. Jos. R. Winch, from plans of Mr. E. A. P. Newcomb; cost, $20,000; Mr. C. W. Bowers, contractor.

MONROE, GA.— Brick and stone court-house; cost, $22,000; Bruce & Morgan, architects, Atlanta.

MORRISON, ILL.—A church is to be built for the First Presbyterian Society from designs of W. W. Sanborn, of Clinton, Io.; cost, $12,000.

NEW BRITAIN, CONN. — The Russell & Erwin Manufacturing Co. are building a brick foundry, 80′ x 230′; a new finishing-shop is also being erected, 44′ x 130′, three-st'y, and built of brick.

NEWPORT, VT. — A large grain elevator, the only one in northeastern Vermont, is being built here.

OXANNA, ALA. — Brick livery-stable, for Zach. Taylor, 70′ x 160′, stalls to accommodate sixty horses; cost, $10,000; Fay & Eichberg, architects, Atlanta, Ga.

RICHMOND, VA. — H. D. Dean, architect, of Chicago, has prepared plans for a hotel and court-house.

ST. LOUIS, MO.— Mr. E. A. P. Newcomb, of Boston, Mass., is the architect of a brick and frame house for Mr. Geo. O. Carpenter, costing about $18,000.

SYRACUSE, N. Y.— A $10,000 residence, first story of brick and stone, above shingles, is being built for Mr. Justus Saubert from designs of Messrs. C. F. & J. A. Schweinfurth, of Cleveland, O.

TOPSHAM, ME.— An office building with hall, to cost $10,000, is to be built for Col. Wildes P. Parker, from designs of Mr. G. E. Harding, of New York.

WORCESTER, MASS. — Warner H. Joslyn and Asa L. Kneeland have begun the building of six $1,000 cottages, of five rooms each, on the west side of Mason St., between Chandler and Parker Sts.

Messrs. Joslyn and Kneeland have also begun the foundation for another brick three-st'y six-tenement block on the e s of Piedmont St.

Alden Thayer is building two $2,000 four-tenement houses, of wood, four rooms to each tenement.

The Swedish Baptist Society have made arrangements for the erection of a church; cost, $5,000. It will be the fourth Swedish church in the city.

Work on the foundation for the new brick extension to the Holman machine-shops is progressing rapidly. The dimensions are 64′ x 167′, three-st'y. Work on the superstructure will begin early in the spring.

Bids and Contracts.

NEWPORT, R. I. — Bids for the new asylum-building have been opened at the City Hall. They were four in number, as follows: Charles H. Burdick, $22,300; H. Augustus Kaull, $23,600; L. D. Willcutt, $23,675; John D. Johnston, $24,248. The Committee will recommend Mr. Burdick's bid to the Council.

COMPETITIONS.

COLOSSAL STATUE OF SIR W. WALLACE.
[At Aberdeen, Scotland.]

10 BRIDGE ST., ABERDEEN, October 15, 1883.

The testamentary trustees of the late Mr. John Steill, of Edinburgh, hereby notify that they will receive models for a colossal statue of Wallace, in bronze, with basement of granite blocks, to be placed on the mound in the northwest part of the Duthie Public Park, near the city of Aberdeen, in conformity with instructions left by Mr. Steill, at a cost not exceeding £3,000.

Intending competitors, on application, accompanied with a remittance of 10 *s.* 6 *d.*, to Mr. John Otto Macqueen, 10 Bridge Street, Aberdeen, will be supplied with copies of (1) Mr. Steill's instructions, (2) conditions of the competition, and (3) lithograph plan of the Duthie Park, showing sections of the mound.

The author of the accepted model will be employed to execute the work, and the author of that next in order of merit will receive a premium of £50. The trustees do not, however, bind themselves to accept any of the models.

All models must be in conformity with the above conditions, and must be delivered in Aberdeen, free of expense, addressed to Mr. J. O. Macqueen, Municipal Buildings, Aberdeen, **not later than July 1, 1884.**

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MONUMENT.
[At Milwaukee, Wis.]

The committee in charge is now prepared to receive designs and proposals for the erection of a granite monument on the lot in Forest Home Cemetery, in memory of the victims of the Newhall House Fire. The cost of the monument must not exceed $3,000, including the lettering on the monument of the names of the victims.

The foundation will be laid even with the surface of the ground, at the expense of the committee.

The monument is to be erected as early as possible in the season of 1884, and designs and proposals should be sent in **not later than the first day of January, 1884.**

The committee reserves the right to reject any or all of the designs or proposals submitted.

Proposals may be sent to, or any further information obtained from, WM. P. MCLAREN.

414 Chairman Committee, Milwaukee, Wis.

PROPOSALS.

PUMPING ENGINES AND BOILERS.
[At Catskill, N. Y.]

CATSKILL, N. Y., November 12, 1883.

The Board of Water Commissioners of the Village of Catskill, N. Y., will receive bids **up to 3 o'clock, P. M., December 3, 1883,** for two pumping-engines and boilers complete, of the capacity of seven hundred and fifty thousand gallons each per day.

Plans, specifications and requirements can be had on application at the office of the Engineer.

The Board reserves the right to reject any and all bids. E. LAMPMAN, President.

W. S. PARKER, Engineer. 413

GAS-FIXTURES.
[At Charleston, W. Va., and Topeka, Kan.]

OFFICE OF THE SECRETARY,
TREASURY DEPARTMENT,
WASHINGTON, D. C., November 5, 1883.

Sealed proposals will be received at this office **until 2 o'clock, P. M., of Monday, November 26, 1883,** for manufacturing, delivering, and placing in position in complete working order, certain gas-fixtures for the United States court-house and post-office buildings at Charleston, W. Va., and Topeka, Kan.

Upon application to this office, detailed information will be furnished to all manufacturers desiring to submit proposals.

The Department reserves the right to reject any or all bids or parts of any bid, and to waive defects.

H. Q. FRENCH,
413 Acting Secretary.

CONCRETE SIDEWALKS, GRADING, ETC.
[At Philadelphia, Pa.]

PUBLIC BUILDINGS, PENNSYLVANIA SQUARE.

Sealed proposals will be received at the office of the Commissioners, in the buildings, **until 12 o'clock, noon, of Tuesday, December 4, 1883,** for all the grading, concrete and permanent covering required for the sidewalks on the east, south and west fronts of the buildings.

The covering must be of suitable and well-approved materials, natural or artificial, laid in the best manner, complete.

Each proposal must be accompanied by a sample of the material proposed, together with description in detail of the manner of laying, and, if artificial, of its composition, and places and dates where and when used.

Full particulars as to form and every detail and requirement of the proposals, with the necessary blanks and envelopes, may be had on application at the Architect's Office in the Buildings, second story, south front.

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

By order of the Commissioners.

SAMUEL C. PERKINS, President.
Attest: F. DEHAES JANVIER, Secretary. 414