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THE subject of professional competitions still continues to occupy the attention of architects abroad, in France and England, as well as Germany. In England, where the absence of restrictions upon the practice of architecture has permitted the development of a class of half-educated and unscrupulous quacks, the promoters of small competitions, mistaking these importunate individuals for architects, have fallen, to a certain degree, into those habits of regarding and treating the profession which we know so well in this country. A slow but determined effort is in progress for securing a change in these respects, and to unite the members of the profession in resisting the practices to which only the most unworthy of them willingly submit; and the first decisive step has been taken by the issue of a circular letter, which is to be sent to all the architects in the United Kingdom, inviting each person receiving it to engage that after a certain day, about the middle of the present year, he will refuse to enter any public competition, unless the promoters of the competition give assurance that the award shall be made upon the advice of a professional architect of established reputation. As a very large number of architects have already signified their approbation of this measure, it is quite probable that the response to the circular will be so general as to put public competitions henceforth on a very different footing, and to prepare the way for further reforms. The committee of the Royal Institute of British Architects appointed to consider the matter seems to have done wisely in proposing this as the first point to be amended. To say nothing of the propriety of requiring expert, that is to say, intelligent judgment upon designs contributed in good faith—a propriety so obvious that no reasonable person could fail to acknowledge it—the lack of professional knowledge in deciding upon the merits of competitive plans has been, and will always be, productive of more damage, loss and disappointment, both to competitors and owners, than all other causes put together. To the custom of setting merchants and lawyers to judge of the qualities of architects, added, in this country, to the custom of offering the smallest compensation for which an apology for a plan can be secured, is due the lamentable architectural character of most of our public buildings, which, if they do not fall down from ignorant construction, excite the ridicule and contempt even of those responsible for their erection by their unskilfulness of arrangement and vulgarity of design; while the architects who compete for the favor of such judges, if they are so scrupulous as to rely upon the merit of their designs, instead of impudent pertinacity, for recognition, meet in most cases with nothing but disappointment and loss. We are sure that many of our readers will agree with us that such experiences as these form the most depressing and demoralizing influence which affect young architects, and the profession has no more pressing need than the suppression, by the means pointed out in the English circular, of all such contests.

MOST of our readers know something about the introduction of novelties in the way of building appliances, and their own recollection will show them that very few of the inventions which come within their observation obtain any remunerative sale within five years from the date of issue of the patent which is intended to reward their author for his ingenuity and industry. In the great majority of cases, the patents upon articles which have established a market for themselves date back several years, and even then some years of profitable sale are generally necessary to repay the expenses already incurred. Among inventors, who, as a class, are modest and poor, but quite intelligent enough to understand the circumstances of their business, the passage of such a law would mean the immediate closing of workshops, the abandonment of experiments already begun, and the return of the enterprising and ambitious mechanic in despair to the dull routine of ordinary work. In one word, there would be, after the passage of the law, no reasonable hope of profit from new inventions, and those capable of making them would cease their efforts at once. The other law, which has a little flavor of dishonesty as well as impolicy, is obviously intended for the benefit of persons who have bought patented articles from irresponsible persons, who manufacture them surreptitiously, without the license of the patentee. There is a good deal to be said for these innocent persons, who have in some cases been hardly dealt with by the agents of patentees in search of infringements, or, if the reports are true, by gangs of black-mailers pretending to be patentees' agents; but the effect of the law, as it stands, would be to benefit the pirating manufacturer much more than his customers. Under the present law, a patentee can recover reasonable damages from persons whom he finds infringing his rights, and they, if innocent of evil intent, can demand what they have lost from the person who sold them the infringing goods; but by the proposed legislation the latter might sell as many goods as he wished, and pocket the money for them, without fear of being called upon by his customers to pay the expenses which his fraud might cost them. The speculators who stand always ready to encroach upon the rights of others would not be slow to discover their advantage in this respect; and, as the *Scientific American* says, no sooner would a valuable invention be perfected than scores of irresponsible adventurers would begin the surreptitious manufacture of the article which formed the subject of it, and would flood the market with the fraudulent goods, selling them to the public, which could buy and use them with impunity, and cutting off the inventor himself from the trade upon which he should be entitled to rely for reimbursement of the time and money spent upon the experiments of which the speculators alone would reap the reward. We venture to say that there is no one who, if the case were understood, would really desire to put an end in this country to the inventions which have hitherto so distinguished it, by depriving inventors of the very moderate rewards which are now open to them; and it is most unfortunate that a certain clamor, probably raised by interested parties, should have been sufficient to give the impression that any considerable body of honorable citizens desired the legislation which is now under consideration.

THE subscriptions for building the pedestal of the great Bartholdi Statue do not increase very rapidly, and the prospect of completing the work seems farther off than ever. So far, about a hundred and forty thousand dollars have been collected, half of which has been consumed by expenses, or has been used to pay for the concrete foundation, which is not much more than half done. A day or two ago the committee opened the bids which have been made for the superstructure, and found that the cost for this alone would be about two hundred and forty thousand dollars. It is estimated that the expense of placing the statue on the pedestal will be something like sixty thousand dollars, so that the total cost of getting the gift of the French people set up where it can be seen will be about four hundred thousand dollars. Canvassers are busily at work collecting small subscriptions, and it is said that about a thousand dollars a week is received in this way; but the canvassers' salaries and expenses will have to be deducted from the total, so that even if the liberality of the people to whom they apply should hold out, it will be, at that rate, at least ten years before money enough is obtained to complete the work. The Executive Committee is said to think it strange that so little is

received from the West. As the statue is a gift from the French people to the Americans, it would seem that the whole country might be equally interested in receiving it properly, but, so far, less than five hundred dollars have been sent from Western cities.

MANY architects have occasion to interest themselves now and then in the construction of conservatories and plant-houses, and it is worth remarking that, according to a writer in the *Garden*, quoted by the *Scientific American*, rough or rolled plate glass forms a particularly good material for covering such structures. A theory was at one time current that the rays of the sun, in passing through thick glass, acquired a certain scorching property which was unfavorable to the growth of plants; and conservatories were accordingly glazed, in most instances, with ordinary sheet glass. As sheet glass transmits heat readily, the use of it involves a considerable waste of fuel in keeping the conservatory in all parts at the necessary temperature; and it is easily broken by hail or accidental blows, exposing the plants sheltered by it to serious injury in cold weather; so that of late years rolled plate-glass has been used for many houses of the kind, particularly in England. The thicker covering has the certain advantages of being impervious to heat, and proof against hail or light stones, so that the house is better protected and more uniformly warmed, at a smaller expense. So far, no practical difficulty seems to have been experienced from the burning of the foliage under the plate glass, and the *Garden* correspondent asserts that, far from this, grape-vines, at least, do better under rough plate than under clear glass. The grapes grown under the rolled-plate, in his experience, are of better color and quality than those under clear glass, and the vines generally preserve their foliage fresh and green in an unusual degree, while red spiders, the pest of hot and dry conservatories, are less troublesome than in houses of the old-fashioned kind. These effects, he thinks, are to be attributed mainly to the diffusion of the direct rays of the sun by the inequalities of the glass, which refract the light in all directions, and prevent it from falling with undue force upon the vegetation most exposed. So marked is the softening of the sunlight that vines in houses glazed with the rough plate need very little of the ventilation generally found necessary to prevent the leaves from withering, and one of the principal difficulties of plant-culture under glass, the danger of chilling the foliage by cold currents of air, is thus removed.

A COMPETITION is announced for a monument to the great French leader, Léon Gambetta, to which French artists only will be admitted. The cost of the monument is restricted to seventy thousand dollars, and the competition is to be a double one, the authors of the best three designs submitted in the preliminary trial being invited to a final contest, in which the first prize will be either the execution of the work, or a money premium of two thousand dollars, while two inferior prizes, of fifteen hundred and eight hundred dollars, respectively, will be awarded to the other competitors. If the second competition should fail to produce a result satisfactory to the committee, the three competitors will be dismissed with prizes of six hundred dollars each. The jury of award is to consist of fifteen members, ten of these being chosen by the committee, and the other five by ballots cast by the competitors. The clause relating to the ignominious dismissal of the three contestants in the last trial, if their efforts do not happen to meet with the favor of the committee, reads very much like portions of some of our own "invitations to architects," and very little like those common on the Continent. So foreign is it to the French notions of the dignity of artists, and the value of their work, that we should not be very much surprised at a general refusal of architects and sculptors to have anything to do with the competition. When once the idea of a competition changes from that of an effort on the part of a committee to secure a choice of designs by paying several artists instead of one, to that of a scramble after favors, which the committee can dispense or withhold, the whole affair is degraded, and should be left by respectable men to those who have no hope of employment, except through the chances of a scramble.

"JERSEY justice," according to the *Sanitary News*, has within the past year turned its attention to the business of producing and selling milk, and stringent statutes for the prevention of adulteration have been enacted, and are en-

forced with the thoroughness characteristic of the execution of the laws in that State. As a comprehensive measure, easily understood and easily carried into effect, the New Jersey statute provides that no milk containing less than twelve per cent of milk-solids shall be sold in the State. To determine whether this standard was low enough to include the milk of all cows in healthy condition, eighty-five analyses were made, of milk from common cows, fed with food of various kinds, none of which showed less than twelve per cent of solids present, so that this may be regarded as a safe and proper standard of purity. As might have been expected, the effect of the law has been to benefit very materially the honest farmers of the State, as well as the city babies. This is shown by statistics, which place the average return to the farmer from a forty-quart can of milk during 1879, before the passage of the law against adulteration, at three hundred and forty dollars and sixty cents; while in 1883, after the competition of chalk-dust and water had been forcibly suppressed, the average return from the same can was four hundred and seventy-four dollars and eighty cents, a gain of nearly forty per cent. As in most cases of the kind, the only sufferers have been the adulterators, who no longer, in New Jersey, reap enormous profits from the sale of water at seven cents a quart, and they have therefore transferred their delectable industry to regions where legislators and executive officials are less squeamish in such matters.

ONE of these regions would seem to be the State of Connecticut, where an attempt was recently made to check the dangerous practice of gathering ice in winter from foul ponds, to sell it in summer, full of putrescent particles, to the poorer or less critical class of consumers. Every one has observed cases of this kind, a small ice-house being often seen erected upon the banks of what is simply the cesspool of the neighboring hamlet, receiving its main supply, beyond the surface water of the winter storms, from the sink-drains and pumps of the nearest houses; and much disease is undoubtedly caused by the use of ice formed in such places; so that the bill introduced before the Legislature, forbidding the sale of ice cut from streams polluted by sewage, mill-waste or other impurities, was a just and wise one. It seemed, however, that a member of the Legislature had a client, a constituent, who possessed a large quantity of ice of the objectionable kind, stored ready for the approaching warm season. When the bill came up for decision this member explained the circumstances very frankly, arguing that since his friend had innocently collected a large store of the ice referred to, he ought to be allowed an opportunity to dispose of it; and he therefore suggested an amendment, to the effect that the new law should not go into effect until next November. The other legislators, perceiving the force of this reasoning, acquiesced in the amendment, and the bill was passed in that form. Some of the editors of the Connecticut newspapers, however, not having before their eyes the fear of constituents with dirty ice to sell, protested vigorously against the change, by which license was given to all who desired to pursue that lucrative trade to do so for a whole season, and the bill was consequently recalled in the Senate last week, and the amendment struck out.

THE German Government seems disposed to enter into a rivalry with the French in the establishment of technical schools, and while the great group of buildings for industrial training in Paris is not yet even begun, an immense building for the same purpose is already completed in Berlin, and will soon be occupied. The object of the Berlin Technical High School is nominally quite different from that of the French schools, but the general influence of the training given in each, to persons of very different classes in society, will in the end be much the same. The Berlin building, of which plans and elevation appear in several of the professional journals, seems to be planned with that skilful simplicity in which the best German architects are coming to rival their French brethren, and presents a most imposing façade of more than seven hundred feet in length. The building includes, besides class-rooms, lecture-rooms, laboratories and machine-rooms, a room for testing building materials, and various smaller apartments for special purposes. The cost of the building, which is constructed with unusual solidity and luxury of material, has been nearly two million dollars, an immense sum for a country so poor and economical as Germany to spend even on a school.

GEORGE FULLER.



but it seems to me, at least, an open question whether the greatest men in every age have not been those who had peculiarly distinct ways of seeing and of feeling, and who revealed them with peculiar force. Looking back at those of long past days we see that they do, indeed, express the general temper of their time and land beneath their expression of themselves. There are general affinities and diversities which mark them off into groups and schools, and separate them all still more decidedly from us; but in their own day, seen without the unifying perspective which time affords, they doubtless each appeared as unique and individual as look to us a Corot or a Courbet: and if individuality ever was precious it must be doubly so to-day. Times and intellectual conditions change, and with them needs and values. In former centuries the "spirit of the age" meant something much more definite than now—it meant the spirit of a certain country, of Italy, or Spain, or Holland; but modern life daily grows more cosmopolitan, less local and diverse. There is so much less difference to-day between one land and another that the artist, in expressing his people's voice, speaks with a far less distinctly-marked utterance than in any former generation. Of course subject matter will differ if all men paint from home materials, and such difference seems to me a thing that should be cherished and made the most of since we are losing variety in other ways; but difference of subject matter, however pronounced, does not make all the difference between one kind of art and another. This comes from difference of standpoint, feeling, emotion,—and, here I repeat, one modern nation, taken as a whole, daily growing more like another. We are thrown back more decidedly than ever before on *personal* differences, if all art is not to remain at a dead level of uniformity; and the general, of course, involves the particular. Just when we are most in need of strongly-marked personalities, it becomes most difficult to preserve them fresh, unbiased and distinct. The individuality of the man is threatened by the same influences which have so greatly impaired the individuality of nations. Therefore, the loss of such a distinct artistic character as Mr. Fuller's is one we cannot too deeply mourn, especially as beneath it he also expressed our national temperament in a very marked and noticeable way.

It was my pleasant task some months ago to attempt an analysis of Mr. Fuller's art,¹ and I have no excuse for repeating the effort here. The pleasantest part of that task was to anticipate his future—to think of the works we might expect from his hand during the years to come. And our saddest thought to day is that we shall never see those works, that he has laid down his brush just when he had fully learned its use. It may seem strange to say that a man's death was premature when his age was sixty-two; but Mr. Fuller's was premature, and in a double sense. He was not one's idea of an old man, in spite of his whitened hair. No one who looked at his sturdy frame, who heard his cheery voice, and knew his youthful energy and enthusiasm, could fail to believe that he had years of profitable work before him; and even at sixty-two he was, I repeat, but at the outset of his true career. The story of his life is too well known, perhaps, to need rehearsal here, even in the briefest way. Almost every one must know how different was his course from most painters—how, although he was so well esteemed long ago as to have been named an Associate of the National Academy in 1857, he retired soon after from the world, and worked in obscurity for many years. Only about eight years ago did he emerge from his retreat with a new art at his command, and win himself the place he has since held. From the past eight years only date all the pictures we shall treasure as his legacy; and every year his brush seemed to grow in power, or to give new promise

for the future. Especially in his portraits was there an ever-increasing increase in delicacy of feeling, in subtlety of insight, in perfection of expression, and we may believe that he would have applied himself in future to work of a more ambitious sort than hitherto. Indeed, when I last saw his studio some months ago, he had a picture under way which promised to be his most important—a dramatic scene with many figures, an incident in a witch trial of early New England days. No man was more perfectly in sympathy with the subject, no man's brush seemed so infused with the peculiar local flavor needed for its proper treatment. It will remain in our imaginations as one of the "might-have-beens" we most regret.

If, as I have said, I am excused by a former essay from attempting here an analysis of Mr. Fuller's art, I can now do what I could not with good grace while he lived—bear tribute to his qualities as a man. No one, old or young, was a greater favorite with his brother artists, and no one more deservedly. There will be many of them to remember with me his unflinching good humor and courtesy; his lack of self-assertion; his genial spirit; his cordial appreciation for every good work (whether or no it was in harmony with his own ideas and tastes); his hearty encouragement of young painters; his interest in everything that tended to the advance of American art and artists. I knew of no more delightful place than his studio, where one forgot the art, almost, in one's interest in the man—or felt it to be merely a part, a fragment, an incomplete revelation of a most attractive personality, a most intelligent mind, a most warm and honest heart. He loved his art as few men love it, even among artists; and he seemed to love humanity as do few of us, I fear, in any walk of life. A talk with him was one of the best spurs to effort, to energy, to enthusiasm of a clear-sighted and not a maudlin kind that an artist or a critic could receive. No one could be careless, or apathetic, or unreasoning, or hypercritical in Mr. Fuller's company—no one could forget the pleasure and the responsibility of one's work, whether that work was painting or mere commentary. It was a lesson in temper to hear him speak, to note the self-reliance yet unfeigned humility with which he thought of his own performance. Sensitive to criticism he was—as every earnest soul must be, but sensitive in the nobler way—in proportion always to the source from which it came rather than to the verdict which it gave. If he respected the critic he listened carefully and sweetly, whether the words were praise or blame; if he did not he was not greatly touched by either. To one who had praised him I heard him say, "You have made my work all the harder for me. Your approval is undeserved, now I must try and come up with it." And to one who had written in dispraise I also heard him say, "I was a little hurt at first—but that is over. You did quite right; every man must see with his own eyes, and speak quite honestly, you as well as I. I do not see and feel as you do, but I will think it over—perhaps your way is better, though as long as I don't agree with you, and I don't think I ever shall, I must go on as I have been going;" and no one who had ever spoken with Mr. Fuller could doubt that in both cases he meant exactly what he said.

The charge of affectation has, I believe, sometimes been brought against his work, but surely never by a man who knew him. A more simply, and evidently honest and unaffected artist never lived. What he strove for was but just to express *himself* as clearly as he could. It seems grotesque to us, his friends, that he could ever have been accused of seeking originality for its own sake, still less of posturing to attract the public eye. Popular success was pleasant to him—it cannot be indifferent to any man who feels he has a message to deliver. He must be glad when the public eye comes to understand and value him; but how did he seek success? By seventeen years of steady toil, with no thought of praise or blame from others. *Himself* was the one he aimed to satisfy—the endorsement of others was a welcome but a secondary thing; and even when his countrymen were satisfied he lamented what he called his failure to say his say in the manner he would wish. A true artistic temper in this respect, but, I fear, an exceptional one in others—in its "sweet reasonableness;" its lack of jealousy; its patience; its calmness; its dignity; its open-mindedness where real criticism was concerned; its calm indifference to mere outside babble.

I have heard many artists speak well upon art in general, but few so well as Mr. Fuller. His intelligence was acute and cultivated; his sympathies were wide; his tongue a ready interpreter—he could give a reason for the faith that was in him in clear, and forcible, and inspiring words. His letters were full of phrases that were epigrammatic almost in their incisive truth. They were more like Millet's letters than like any others I have read—save for Millet's touch of sad despondency. I remember well an animated discussion in his studio when he explained Corot to one who, as he thought, traduced him. I felt that I had never heard so suggestive an analysis of Corot's power, and he gaily promised me his help in an article I wished to write about him. This, too—alas for my possible future readers—is one of the "might-have-beens." More than once I wished he would use the pen as well as the brush; but perhaps the charm would have evaporated as it so often has before. Couture, doubtless, talked well, but no one wants another book like his. I do not think that if Mr. Fuller had written, however, there would have been quite such another disappointment; and, at all events, I must regret that no one did for him what Miss Knowlton did for Hunt—that there is no record left, except in a few minds that knew him, of the charm and acuteness of his conversation when he spoke of the art he loved so well.

¹ Century Magazine for December, 1883.

Another word I must add—not so much with reference to him as to myself, and those whose work is, like my own, to write of artists. We are often accused, when we confess to knowing and admiring a painter as well as to knowing and admiring his art, of confusing the one feeling with the other. We are told that we praise him either with conscious, friendly falsehood, or with unconscious, friendly bias. It is presumed that the personal had preceded the critical estimate, whereas, in truth, it more often follows as a consequence. I would not dwell upon such a point here did I not know so very well how wide-spread a feeling this is, and how constantly it militates against the acceptance of the most well-considered and impartial verdict. Of course there is danger of prejudice (either for or against), when a writer comes in personal contact with an artist; but it is a danger that must be incurred, since there is a greater danger of misapprehension and partial insight if one only knows the work and not the worker. Of a single picture one may judge on its sole intrinsic merits—but not of a painter as a whole. To do this one must know aims, intentions, and processes as well as mere results. It was my earnest admiration for Mr. Fuller's art that made me wish to know himself—and it was a piece of good fortune seldom vouchsafed in this contradictory world to find him so exactly what I could have hoped.

It is a pity, I think, for the sake of the National Academy, though not a matter of much moment to Mr. Fuller or his fame, that he was not promoted before his death to a place in its upper rank. Who had so long held the lower title? and who so well deserved the loftier? Surely very few. I think not one of the many who have been bidden to come up higher since he won his new renown eight years ago.

M. G. VAN RENSSLAER.

HYGIENE AND MUNICIPAL GOVERNMENTS.



EVERY government ought to concern itself about the dirt, and consequent large mortality of its cities. There has been in the past a carelessness which the new discoveries of science make henceforth inexcusable. Lord Beaconsfield has well said that the weal of nations depended on hygiene, and that the first duty of a statesman was to look after the health of the people. The

health of a city is undoubtedly very much dependent upon its cleanliness, drainage, etc.

Paris is perhaps the best-cleaned city in Europe. There have been many misleading and conflicting statements as to the mode of cleaning the streets of Paris. A writer in a late popular American magazine gives a description of the way of cleaning Parisian streets to-day as it was under the empire, evidently not being aware that the ancient method of disposing of household garbage was changed by the later republic. Most of his information was probably taken from a new edition of an ancient book by Fonnsagrives, which describes the method of cleaning the city under Napoleon III, and was correct from 1853 to 1870. During these years, the garbage from households was thrown into the street after 9 p. m. The *chiffonniers* commenced their rounds at that hour with lanterns, and extracted the articles which suited them from the heaps of rubbish before each house. The remainder was collected and carried away before daylight by the municipal carts.

In 1870 all this was changed. A new decree of the City Government directed that refuse should be retained in the house and brought down early in the morning. The dust-men with their carts, resembling those of American cities but larger and deeper, pass very slowly along the streets from 6 to 8 a. m., ringing a bell. Housekeepers descend at its sound with their receptacles of rubbish, which are emptied by the dust-man into the cart. The republic boasts of having made an immense saving of expenditure by this mode of proceeding over that of the empire. But, if it has spared the purse of the republic, it is certain that it has deteriorated the public health, by forcing people to retain garbage, combined with household dust, fermenting all night inside the house. In Paris, people do not rise early, and it must often happen that the rubbish-box remains unemptied several days. What a beautiful variety of microbes Mr. Tyndal would discover in these receptacles, and how delightfully they must enrich the "floating matter of the air!" It is probable that this system has greatly increased the yearly mortality of Paris. The average quantity of refuse carried away is 1700 cubic metres daily.

At present the roadways of Paris are cleaned in the early morning by carts with revolving brushes placed diagonally under the bottom of the vehicle, which brush the dirt into the cart, operating something in the same way as a carpet-sweeper. There is no dust from this contrivance, and the paved streets are swept perfectly clean, as well as the lava pavements and macadamized roads. These mechanical sweepers, of which there are 190, perform each the labor of ten men, and are capable of cleaning, hourly, a space of 5,500 square metres. The cost of one is \$200, and \$40 per year suffice for its maintenance. It is drawn by a single horse.

Then come sweepers who brush off the dust of the sidewalks into the gutter which the cart with revolving brushes has not touched.

Later come other sweepers, many of whom are women, in the wake of the sidewalk-brushers, who, with great brooms of twigs, sweep the gutters, the water having been turned into them from the street hydrants. The dirt is swept into the sewer-openings at the street corners. The water is permitted to run a few minutes, till it passes through the perfectly-cleaned gutter as clear as a trout-brook.

The sanitary engineers of Paris are compelled to maintain a force of about 3,000 employés: 2,200 men, 750 women, and 50 boys. The men receive from 50 to 80 cents per day, and the women 4½ cents per hour. Paris is therefore cleaned daily by the labor, or its equivalent, of 5,000 persons, at a total annual expense of about \$600,000. The streets are watered as may be necessary, and to the water disinfectants are added, such as chloride of lime, sulphate of zinc or iron, carbolic acid, etc. Everything possible is done to disembarass the city of unhealthy rubbish, by cleanliness and drainage. Nothing can be thrown from the window into the street, or through the pretty arabesque gratings which protect the roots of the trees. Even a piece of paper is apt to result in a *procès verbale*, and later, a fine.

But if Paris is cleaned as far as the eye can judge, the air is far from being immaculate. A sunbeam passing obliquely through a narrow opening between lofty buildings discloses air charged with a vast number of motes. Yet it is forbidden to shake a rug or garment, or the piece of baize with which the waxed floors of Paris are dusted, out of the front windows after 7 a. m. An American city must contain, in its air, a much greater proportion of woollen dust than French cities, as at least double the amount of woollen articles, carpets, curtains, etc., are used. Dust from rooms is proved to be largely inorganic, but some of it contains minute organisms, as well as the germs of organic life, and this must be especially the case in the neighborhood of hospitals. As one proceeds from the circumference towards the interior of Paris, the bacteria of the air augment. The last *Annuaire* of the Observatory of Montsouris for 1883, states that one finds by the cubic metre of air in the Park of Montsouris, at the extremity of the city, just beyond the great park of the Luxembourg, of which it is a continuation, 51 microbes; in a room of the Observatory, 325; in a room of the Rue de Rivoli, 680; in a sleeping-room of the Rue Monge, a thickly-crowded part of Paris, 5,260; in the Hospital of La Pitié, in the springtime, 7,730; in the winter, 13,280. If one examines the dust which accumulates on the furniture of apartments, one finds the same increase of microbes from the circumference towards the centre of Paris. The bacteria found in a gramme of dust in the Observatory of Montsouris are 750,000; in the same quantity in the Rue Monge, 2,100,000. A notable difference! The mortality of Paris follows, on an average, in from eight to ten days, a proportion corresponding to the number of bacteria observed in the air of Montsouris and the Rue de Rivoli. In the Park of Montsouris, the number of microbes found in analyzing the dust fallen on a surface of one square metre, during a period of twenty-four hours, is 23,000.

When one considers that the sewers of Paris are subterranean streets, with sidewalks flanked on either side by telegraph-wires, gas and water pipes, and lighted by gas, and continually cleaned by an efficient corps, and that no water-closets, except those of two or three public buildings and the street urinals, empty into them, one would not expect that the number of microbes contained in the air would be very considerable, and it is actually much less than in the apartments of the Rue Monge.

But what shall be said of our sewers in this respect? We are trying the experiment, never before tried on a large scale, of throwing the products of human waste on to the surface of our rivers and harbors, mixed with the refuse of fabrics, etc., under what might be termed, in summer, a tropical sun.

The mud and dust of large cities is largely composed of the manure of horses. In London it is thirty per cent. The mud of the wood pavements is almost exclusively composed of it. After thirty years' trial of wooden pavement on Regent Street, it has been found necessary to replace it, on account of the ammoniacal emanations with which it is saturated, tarnishing the articles of jewelry shops, although the streets are swept very clean. Horses are subject to scarlatina, pink-eye, pneumonia, etc., and communicate these diseases to human beings, and it is desirable that only horses for carriage-driving be kept in large cities, and that the sad-eyed, weary-looking beasts attached to street-cars, omnibuses and heavy teams, whose piteous condition is a reproach to our civilization, should disappear and be replaced by steam, electric, or compressed-air machines. The French Electrical Power Company made a trial trip of their electric street-cars in Paris, in September, 1883, running thirty miles in three hours, with entire success. The speed was nine and one-half miles per hour on level ground, and five and one-half miles on an ascent. The cost is one-half that of horse-power. The ease with which the car travelled over certain sections of ground, without rails, was also admirable, and proves that electricity is well adapted for road teams, as well as tramways. One hundred and fifty miles of electric railway are now in operation in Europe.

As to American cities what shall be said? In our smaller cities, the mud, consisting of the filth of years, is mixed with a quantity of broken stones, which hurt the feet of the horses when first deposited, and injures the lungs of human beings when ground into powder. If rightly made, this road may be as hard and even as pavement, and as easily swept, but it is rarely, if ever, properly prepared in America. Our large cities with paved streets are guiltless of cleaning, except the languid drawing of a broom at much too long intervals

by an omnipotent voter. How ill it is done is shown by the fact that careful housekeepers are obliged to keep their windows closed, even during the warm season, and the prevailing odor is so sickening, from the pollution of the soil, that people are driven out of the city by the infected air. In New York, on the sacred promenade of Fifth Avenue, on Sunday, when it is theoretically clean, the odor of manure is simply overpowering. Yet New York, under a different regimen, might be a summer watering-place for rural visitors, who would visit it for swimming-schools, sea-bathing, etc., and its theatres, operas and concert-halls, instead of being deserted might be thronged with strangers, and its shops crowded with rural shoppers.

The Parisian cart with revolving brushes has been copied in New York, as far as the brushes are concerned, but instead of brushing the dirt into the cart, they brush the greater part of the dust into the air, at an hour of the day when the streets are most crowded, thus teaching unhappy pedestrians a spirit of meek acceptance of indignities, and a disposition when one side is covered with ashes and dust, to turn the other also, which justifies Mr. Herbert Spencer's lately-expressed opinion in regard to our tolerance and too patient submission to grievances.

The remainder of the dust which is not dispersed into the air is deposited into a furrow, supposed to await the leisure and shovels of industrial citizens of foreign extraction. A well-known dry-goods shop on Broadway, between Fourteenth and Twenty-third Streets, finding its costly merchandise injured by the filth of the street, has adopted the expedient of stationing a man with a carpet-bag and brush in front of its precincts, to sweep up the noxious dirt of equines, and this astonishing and unique¹ spectacle among the cities of the civilized world is a bitter irony on a metropolis claiming in population and civilization, to be one of the four great commercial capitals of the world; but in matter of cleanliness on a par with a Turkish village.

Street sweepings and the dust and garbage of households should be cremated outside of the city in large crematories, such, for example, as a Siemens' furnace. The same disposition should be made of dead animals and the refuse of butcheries, and thus a prolific source of disease removed. Such a system has had an extended trial in Leeds, Blackburn, Warrington, and Derby, England, in a furnace requiring no fuel, the cinders and combustibles found in the refuse being sufficient.

We are looking forward to the time when our civilization will be sufficiently advanced to compel us to construct subterranean streets, with sewers running through them, as in Paris, through which should pass our gas and water pipes, telegraph and telephone wires. Then it will be possible to lay roadways and sidewalks, in a permanent and durable manner, which would not permit the absorption of filth through cracks and crevices, and the saturation of the ground beneath houses.

Let us have modern improvements, by all means, but let us first have the necessary pavements, gutters, and street-sweepers, both mechanical and human. Let us not fancy, while the death rate of even our small cities exceeds that of great capitals, like London, that we are in the foremost ranks of enlightenment. Let us remember that in the model dwellings for workmen, built by the Earl of Shaftesbury, at Clapham, near London, consisting of fourteen streets and 1032 houses, the death rate was reduced from 22 to 12 per thousand, and that Detroit, Mich., once a very unhealthy city, contending with great natural disadvantages, has reduced her death rate to 14 per thousand, through the enlightened action of her sanitary health board.

Morbific principles swarm at present in our large cities, while unhealthy miasms push with great vigor. Microscopic investigation shows agents of human destruction formerly unknown, and governments commence to be disquieted at the voluminous record of facts and figures that scientific inquest discloses.

The much-vexed problem of how to dispose of sewer-water cannot as yet be solved satisfactorily. It is the question which precedes all others in sanitary reform. This much is certain, that the solid matters of sewers should be caught in traps, at some convenient points of the main sewer, and be transported to a cremating furnace, before the water, disencumbered of the greater portion of its solid particles, is permitted to discharge itself into harbors or rivers. We need a society, in each of our large cities, for the prevention of river and harbor pollution. The forests have found their defenders; will not the public conscience awaken to the wrong being inflicted on our great watery highways.

As to sewage-farms, regarded with so much enthusiasm by some persons in England, I can only state that the vegetables grown on the plain of Gennevilliers, where a portion of the sewerage of Paris is diverted in canals for irrigation, are claimed to be watery and lacking in nutriment, breaking before they are sufficiently cooked. The strawberries, though large, have a flavor suggestive of evil odors, and are watery, wanting the delicate perfume of fruit grown in the usual manner and decay quickly. In the seventeenth century it was forbidden to sell in the markets of Paris vegetables grown on land where sewer-water had been used for irrigation, as such vegetables were declared unfit for man or beast. Certainly the germs of morbid principles must linger on grass or cereals used for provender for cattle when watered with even partially purified sewer-water. It would seem to be a better plan, instead of cultivating vegetables or

¹ On the contrary, this is quite a common sight in some of the most crowded parts of London. — Ebs.

cereals on land irrigated by sewer-water, to substitute therefor plantations of certain trees or plants used in the industrial arts, as for example sun-flowers, from the seeds of which a useful oil is obtained. It is possible that some of the two hundred species of eucalyptus might grow in our climate. Some of these are valuable for the solidity and durability of their woods, others by their dimensions and rapid growth, still others by their richness in essential oils, are useful in arts and medicine. Most of the species of this tree are more adapted to a southern than to a northern climate. But there must be many trees of rapid growth and a capacity for absorbing water, plantations of which would be advantageously watered by sewer water, and which would be useful for the arts or for combustion. At Gennevilliers transplanted forest trees prosper surrounded with sewer water, especially white-wood trees. S. G. YOUNG.

THE NOTT STOVE.



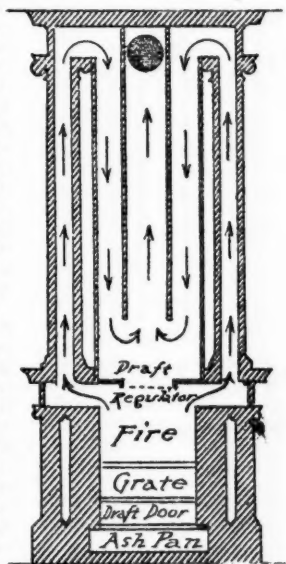
MAJOR J. W. MAC MURRAY, U. S. A., has sent us photographs of a stove designed between 1829 and 1833 by the Reverend Eliphalet Nott, President of Union College, Schenectady, N. Y., and still used in one of the rooms of "North College," though the photographs show a steam radiator alongside the chimney-breast, suggesting the inference that even if the stove is in working order it is not capable of affording the heat required by these sybaritic times.

As an architectural composition it is of marked merit, and is all the more interesting as the work of an amateur. The precise construction of the stove is a matter of doubt, and the section here shown is offered as a solution

of its probable arrangement, for it has never been taken down for repairs, and those who constructed it and knew the mysteries of its internal arrangement have, long since, died.

The stove is made of cast-iron, painted white as shown, except the two large columns, which are cylinders of Russia iron, also painted. These serve as indirect radiators, and greatly increase the heating-power of the stove. The current of heated air and smoke is believed to be directed right and left through these columns by pushing in the knob shown in the centre of the little moulded urn in the mantel frieze; this closes the direct flue, which is, of course, opened when a fire is first kindled, the smoke then having a direct vertical course through the middle flue shown in the section.

When the direct flue is closed the passage of heated air is supposed to be up through the large columns, across behind the frieze of the room, down flues which are indicated externally by slightly projecting pilasters, across again above the closed damper, and then the currents joining pass up the central flue to the chimney proper. In this way both the columns, and central feature of pilasters and enclosed panel-work become heated, and add largely to the radiating surface of the apparatus, while the



open grate gives it all the advantages of direct radiation afforded by an open fireplace.

In principle, it is identical with the apparatus elaborated by Mr. Putnam in his "*Open Fireplace of all Ages*," and it is so good in design that it could be imitated successfully and acceptably wherever it is an object to obtain a considerable radiating surface without sacrifice of architectural propriety. It is also believed that the columns and the central feature are double-lined, the heated air contained in the concentric compartments nearest the outside being conveyed to rooms on the floor above, which they used to heat, to a degree, by direct-indirect radiation; but this would imply a provision for the admission to these spaces of a supply of fresh air, and of this, so far as we know, there is no present indication.

The castings are all well made and carefully moulded, and prove that the designer was unusually lucky in having his work fall into skilful hands.

COMPETITIONS: AN OPEN LETTER TO THE PROFESSION.

[*The Builder* for March 15, contains a statement to the effect that the Committee on Competitions of the Royal Institute of British Architects has just issued a circular to the architects of the United Kingdom inviting them to pledge themselves not to take part in a public competition unless the award is to be made with the aid of a professional adviser. This emboldens us to lay before the profession in this country a somewhat similar but broader proposition, which we drew up some months ago, but until now have hesitated to make it public. We now present it to the profession, and as, in spite of its crudity, it may be the starting-point of a much-desired reform, we beg our readers to give it their earnest consideration, and communicate to us the conclusion they arrive at. We here subjoin our proposition in the form of an open letter.—Eds. AMERICAN ARCHITECT.]

THE PROPOSITION.

MR. — Architect:—

Dear Sir,—Will you kindly read and consider the following suggestion for a coalition of the architects in this country in the matter of competitions, and notify us of your willingness to join in any such movement, or your objections to it if you cannot approve of such a coalition.

It is to be understood that this information is sought by the editors for their *private* information, and not in any way for publication. It is, rather, the preliminary step to some, at present undetermined, scheme for mutual protection in the matter of competitions.

Very truly yours,

THE EDITORS.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—On the supposition that an alliance of the architects of the United States and Canada for their mutual protection in the matter of competitions for architectural designs can be effected without giving rise to possible objectionable features of trades-unionism, I hereby inform the editors of the *American Architect* for their *private* information that, in the event of such a coalition being assented to by a majority of members of the profession, I would thereafter absolutely abstain from taking part in any public competition, or any limited competition for a public building, in which the building-committee or other responsible party issuing the invitation to compete did not pledge itself as follows:—

1. To issue a programme prepared with the help of an architect, such architect or his partners to be debarred from competing.
2. To have at least one architect as member of the jury of award, such architect to have the casting-vote in event of a tie.
3. To assure to the architect securing the award of the jury the execution of his design (if the building is built) at the regular compensation of five per cent on the entire cost of the work.
4. To make no use whatsoever of rejected designs, but to return all such to their authors without loss of time.
5. To pay to the successful architect, in case it is found necessary to abandon the project, the commission regularly charged for so much of the usual professional work as has actually been performed by him, such charge being the usual percentage computed on the estimated cost of the design, which it is now found inadvisable to carry into execution.

SIGNED.

THE ILLUSTRATIONS.

THE LATE GEORGE FULLER, ARTIST.

WITH the consent of the artist's family, and by the courtesy of the photographers, Messrs. Allen & Rowell, of Boston, we are enabled to add interest to the appreciative notice of the artist and the man, which may be found elsewhere in this issue, by publishing a portrait of Mr. Fuller, taken, we believe, within a year of his death.

THE OLD STATE HOUSE, BOSTON, MASS. SKETCHED BY MR. H. T. SCHLADERMUNDT.

This sketch shows the building as it now stands after the restorations made a few years since.

TOWN-HALL AND LIBRARY, WILTON, N. H. OTIS A. MERRILL & ARTHUR S. CUTLER, ARCHITECTS, LOWELL, MASS.

This structure is now being built. The basement story containing the town offices, supper-rooms, etc., is built of Milford granite. The remaining portions are of common face-brick, laid in black mortar, with granite finish sparingly used, and belts and arches of pressed-brick. The cost, completed, will be about \$20,000.

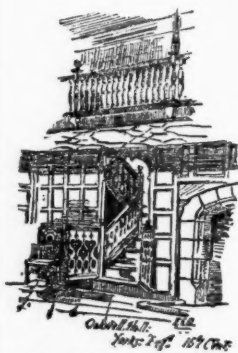
HOUSE FOR WM. C. CASEY, ESQ., TARRYTOWN HEIGHTS, N. Y. MR. H. R. MARSHALL, ARCHITECT, NEW YORK, N. Y.

The house will stand on a ridge overlooking the valley of the Hudson below it some eight hundred feet; the main view shows the Highlands in the distance on the left hand. The piazza wall is of rough stone; all the rest of the house to be of wood, clapboarded to the level of the second story, and shingled above that line; the roof will be of stained red-cedar shingles, and the face of the projecting gable in dark chocolate; the first and second stories in olive brown relieved with black.

COTTON EXCHANGE, MEMPHIS, TENN. MR. H. WOLTERS, ARCHITECT, LOUISVILLE, KY.

FRONTING on Madison Street, 146 feet, on Union and North Court Streets, opposite public park, 70 feet. Exterior of Zanesville pressed-brick, terra-cotta finish, stone cornices and belt courses, slate roof. Contracted for \$99,540, exclusive of plumbing, elevator, heating and interior decoration.

STEPS AND STAIRS.¹



THE every-day ordinary things which we deem of little importance often contribute most to our ease and enjoyment. So also, the simple devices which we think not worth the while to study or understand, in very many instances lead the way to knowledge and wealth. How commonly it occurs when our attention is thoughtfully called to the origin or appearance of some very familiar object, to its ancientness, usefulness or beauty, as it may be, to exclaim in our amazement: "How singular we never thought of that before." As queer and yet commonplace a subject as could well be imagined, is the one which I have chosen, and to which the above remarks may be applicable. Ask the question—How many have considered or even thought of it, or if they have, could conceive of anything surpassing, in connection with great antiquity, a device more useful and simple than the ordinary common building step; or, in a little broader sense, "Steps and Stairs"? It is not a little difficult to believe that while man, through his ingenuity, has attained the position he now enjoys, especially in architecture, after ages of experience, he has in steps and stairs made no proportionate progress, and that the primitive modes of ascent and descent remain in almost every respect the same to-day as they were thousands of years ago. Even the open ladder, with its rounds and sides, which we see everywhere, is but the counterpart of that which was used by the builders while rearing in gorgeous majesty those glorious edifices, the ruins of which command the admiration of the appreciative world. With these same kinds of ladders or steps did besiegers scale the walls of the beleaguered cities and fortresses, and in the softer amenities of life did many a Romeo, no doubt, gain his Juliet's balcony, ages and ages ago. In the Cathedral at Nuremberg there is very cleverly worked, in the architectural decoration of the canopy over the pulpit, an idea of a ladder, suggested, it is supposed, by the story of Jacob's dream, and therefore deemed as ecclesiastically appropriate by the sculptor Kraft, who flourished about the end of the fifteenth century. The steps and raised terraces which are so commanding and pleasing in our realization of a grand and imposing structure, are the old-story similes, only diminutive in comparison to those of the temples away back in the remoteness of the Egyptian Ptolemies and Rameses; upon whose steps, courts and pavements, dynasty after dynasty trod, knelt, worshipped and passed away. The temples of Assyrian greatness, almost sublime because of their elevation, owed their grandeur to the countless steps and numerous terraces by which they were approached. The vast amphitheatres—the Coliseum and that of Verona and others—with their dark masses of elliptical masonry, tier upon tier of steps and galleries, are greater than modern science has built, and as good as we can construct even now, out of the same materials. Nothing simpler or more suitable could be devised than these benches of stone. Nor does it seem possible that they can ever be supplanted by any substitute. The idea of a step is identical with our first efforts to creep. Nature shaped it in the eternal rocks, and it shall forever endure. It is true that the modern lift or elevator has become both fashionable and necessary in meeting the requirements of crowded cities and

¹A paper read before the Albany Institute, March 9, 1884. By Mr. Walter Dickson, Architect.

lofty buildings, but even this contrivance is rarely under any circumstances inserted or used to the exclusion of steps and stairs.

If we for a moment consider how many questions there are involved in the planning of a good stairway, the constructive problems concerned in its execution, and its importance as a subdivision of a building, we cannot but see that it is a subject which demands the greatest attention. The mechanical construction of detail, of which this paper, at this time, does not intend to treat, belongs to the science of stereotomy, *i. e.*, of cutting solids to certain conditions of structure and equilibrium. Without some knowledge of the principles of this science no one can successfully cope with the difficulties to be encountered. It seems to be a law of nature that the sectional angle of steps should not vary from forty-five degrees, and that a step is best proportioned when its top plane or tread is twice as wide as the rise or step itself is high. Assuming that the most convenient, easiest pace of average people upon level ground is twenty-four inches, and that twelve inches is the most natural height to rise when the ascent is vertical, and with this distance to govern the movement in ascending or descending steps, a rule asserts itself, which requires that when the riser or step is higher than one-half of a foot, or six inches, that the top plane or tread must be less than one foot in width, and that when the riser or step is less than half of a foot or six inches in height, that the top plane or tread must be wider. For instance, if a step, taking eighteen inches as a controlling factor, were six inches in height, the tread or top plane would be twelve inches in width. If the step were eight inches in height, the tread would be ten inches in width. If the step were four inches in height, the tread would be fourteen inches wide, and so on, etc. Furthermore, it is a fact, both remarkable and paradoxical, that a stair which is very easy of ascent, is not always so of descent.

In any building the stairway claims an incontestable right, and next to the entrance is the most useful and prominent feature. Staircases, says Palladio, will be perfect if they are spacious, lighted, and easy to ascend. How many are there already built, and daily being constructed, which will bear the scrutiny of such ruling? How many are spacious, well lighted, or easy to ascend? In connection with the above desirable qualities might be asked, the all-important first and foremost question: "How many are safe?" Safe for human lives, because of their strength; safe because of their protection against fire and disaster. It would be an almost hopeless task to ascertain the origin, early construction, and gradual artistic development of the staircase. It has been found located for most part in all of the noted remains of ancient architecture, but occupying remote and obscure places. The fact has been thought singular that Vitruvius throws no light upon staircases, and that the discoveries at Pompeii are equally as silent. This, in a measure, may be accounted for, because of the ancients building their temples and houses but one story high, and enjoying their balmy climate on the terraced roofs, balconies, and walks. During the existence of the Roman empire, especially and in the decadence of the republic, the residences of the rich were built with the most extravagant appointments. As the middle classes, at the dawn of civilization, rose in power, domestic architecture began to develop. The skill of the Romans throughout Europe became wide spread, and the principles of the Roman villas guided the builders in the planning of the houses of the Middle Ages. Yet, even in the residences of the wealthy, the stair when used was but a number of steps, very confined, exceedingly steep, rude, and narrow. When, for comfort or protection, buildings were built with more than one story, circular steps or stairs began to be adopted, which revolved, as it were, around a solid newel, in shape not unlike a corkscrew, and were known by the name of "turn-pike" stairs.

However, there are no known examples wherein ancient stairs ever corresponded in grandeur with the modern staircase. It was not until the twelfth or thirteenth centuries that architecture began to show a healthy development, and later, about the middle of the sixteenth century, that stairs and staircases attracted much attention. Sir Henry Wotton, who was much interested in the subject, says: "To make a complete staircase is a curious piece of architecture." Sir Henry's plan was a straight vista of staircases, each with landings receding from the other, from lower to uppermost story. Since that time an elegant staircase has been acknowledged the most useful and most decorative feature in the interior arrangement of a building. In noble edifices, more particularly, the corridors and staircases impress us as to appropriateness and magnificence: by first impressions we are fain to judge of the whole, when, in fact, we have seen but a part. It is equally true of the stairs in our houses. If, when entering, we are to be favorably impressed, our halls and stairways must possess all of the attributes of space, symmetry, strength, and adaptation.

I here take the liberty, for which I trust I may be pardoned, to say that the departure from these rules in the arrangement of our dwellings is one of the glaring mistakes of our profession. Narrow, dark halls and cramped-up stairs now exist, where there should be a generous amount of walking, moving, and standing room; where the life-imparting properties of good wholesome air could circulate from basement to sky-light, and each room opening into said halls could receive its fresh supply; where daylight could shine in to brighten up the darksome interior of the house; where the stairs should be ample and easy, with frequent landings, so that the aged, the women, and the children, and the crowd itself, could make a hasty exit without fear of broken necks or limbs. Yet, not always is the architect or builder free to exercise his own taste or judgment in the planning of them.

On the contrary, they are oftener forced to exert their greatest skill and ingenuity in combating surroundings and conditions which impede, and are antagonistic to safety, convenience, sanitation and good taste. For it must not be lost sight of that in earning his livelihood, the architect has very often to serve two masters—one his art's inspiration, his labor of love; the other, the inflexible exactions of his sometimes uncultivated client.

It is obligatory upon us to construct securely and to exercise every precaution for the safety and protection of life and limb. No retribution is too severe for the man or body of men who build for selfish gain, to the disregard of such precautionary measures. The day is close at hand when the width of doors, halls, corridors and stairs, and the number of them, private as well as public, shall be determined by a factor of safety proportionate to its seating capacity or the maximum number of occupants that a building is to contain.

A few suggestions, when upon the subject as to the proper location of stairs, how built, etc., might not be out of place. Certainly no stair should be put up, unless sufficiently strong to support any kind of a reasonable, stationary or moving load. It should be absolutely fire-proof, steps, supports, railings, walls, doors, floors and roofs. There must be frequent landings or rests. No winding steps. The flights in each story should be continuous, one over the other, or following each other; each flight to increase in width as they approach the ground floor, and to be well ventilated and lighted. The safest stairway is not that which is placed in the interior of a building, subject to danger by fire in halls, passages and partitions which are not fire-proof. Even though the stairway itself and its parts be invulnerable to fire, the great danger would be from smoke-suffocation. If the entire building were non-combustible, this objection might not avail. No stairway is so entirely independent of surroundings as when fire-proof and placed on the outside of a building; and no stairway is so near perfection, as far as safety is concerned, as the straight, short flight or receding one, with well located landings, continuous from first to top story, and so exempt from turns or returns that no such hindrances could interpose or obstruct a straight-ahead exit from top to bottom. Sir John Soane claimed this direct or "avenue" stair, as his favorite one for public buildings. It is said that he did really construct some elegant edifices after this plan. A ball, rolled down from the uppermost story upon such a stair, would not stop until it had reached the ground.

Following the example set us by the most cunning of animals, there should be in every building and habitation a way to get out entirely separate from the one to get in. There is no questioning the right of way out of a burning building. Every one tries to save himself. "Self protection is the first law of nature." The fewer impediments, the quicker out of danger. Palladio argues "that a staircase should be at the entrance of a building and the first thing to be seen." While this is good advice, it does not always admit of good architectural treatment. The leading idea in every staircase, as advocated by Walton in his treatise on stair building, "should be easy ascent and the straight line broken by a proper number of stages in the most direct movement of the body." Winding stairs or steps, as a rule, are an abomination, and if the statistics of the loss of lives and injury caused by them could be arrived at, it would be seen that many more accidents happened thereby, after buildings were tenanted, than ever occurred during the dangers and hazard of construction. Esthetically, a winding or elliptical staircase, describing its curves of grace, is pleasing to the eye. But is it beauty when we know how difficult it is of construction? The steps of winding stairs are not parallel—one end too wide, the other too narrow, leaving but a space in the centre or run of the steps, as the only suitable place for ascending or descending. With such uncertain footing they are manifestly objectionable, and were it not for a railing to guide, would not with perfect confidence be tolerated. The only real advantage derived from the use of winders in stairs, is economy of space. The landing stair, on the contrary, with its short flights or easy stages in mounting, square and spacious and in perfect repose, conveys in its "make up" precisely what it is—a simple, substantial, appropriate piece of work, commending itself to practical common sense. In our climate, where we have such intense extremes of heat and cold to contend with, in the construction of continuous flights of stairs, especially in our dwellings, schools and similar buildings, it would be advisable, wherever practical, to enclose each flight or story in separate compartments, as it were, not only to cut off the progress of fire or smoke, but to prevent the great waste of heat which naturally rises to the highest point at the cost of comfort to the lowest.

Our public halls and theatres, tenements and flats everywhere, are for the most part a lamentable attestation that steps and stairs are too few, remote and inefficient, when danger is imminent. The quiet amusement afforded by the seating of an audience, disarms us of the apprehensions we feel upon entering a building badly arranged for sudden exit, and it is only when everybody attempts to leave at once, that we, finding how difficult it is to, snail-like, make way through the dense and helpless crowd, can truly appreciate the horror a cry of fire would produce. To get you in is the showman's business: to get yourselves out, is your own business. The horrible holocausts which have from time to time occurred, even in our own memory, have served but little to improve the old style of entrances and exits, and insure greater protection to human life. Does a theatre, or hall, or hotel, burn up and wipe out of existence scores of people, the newspapers preach the sad lesson while the funerals are taking place. The agony, after a while, is supplanted by the next or some other

dire calamity. The building in the meantime, is rebuilt, but practically the same as before, excepting that a few more doors may have been made to open outwardly, a fire-escape added, several fire extinguishers arranged in conspicuous places, and, perhaps, some lengths of hose purchased; but, in all likelihood, these will be found, when required, about as serviceable as life-boats at sea—of no use when most needed.

Probably the most dangerous combination that exists, and one which should in all cases be avoided, are elevator stairs, as it were, enclosing and winding around the elevator from basement to roof, forming an immense chute or shaft, which, in the event of fire occurring at no great distance from it on any story, would resolve itself into a huge flue to suck up with tremendous power, through its burning crater, every vestige of combustible material below.

And again as to the practical utility of the outside iron fire-escapes. Nine out of ten would intimidate the ordinarily resolute man in an attempt to descend them, to say nothing about expecting a delicate, frightened woman, in the midst of a fire excitement, to find her way down to terra firma on them. With a safeguard of some kind (composed say of iron netting) over them, to prevent the escaping occupant from the possibility of falling, greater beneficial results would follow. They should be made more like stairs, well fortified with railings, and their adoption and quantity made compulsory. The horrors of jumping from burning windows would then be avoided by repetitions, at every story, of iron balconies, and numerous covered stairs connecting them. Build fire-proof and thereby reduce the risks and dangers of fires. A single life saved is worth a world of selfish gain. It is much better that we let splendor and æstheticism remain in abeyance until the appeal of humanity is answered, and life no longer jeopardized. Give us laws which will compel the accomplishment of these suggestions, and such heart-rending, sickening recitals as that of the swallowing up of a whole family by smoke and flames, as occurred at the Stanton-street fire, New York, recently, will cease. The tenement death-traps, which are such a stultifying commentary on our civilization, laws, and Christian nature, should not be tolerated. Every city, town and village should hold it as its highest privilege, to have every church, hall, theatre, school-house, mill, factory and tenement house generously and amply provided with every means for instant escape therefrom. Perhaps, in addition, we might add, and justly too, that all places for the above purposes, should be located on the ground floor. Were this the rule, the dread of attending public places would be greatly lessened, and the poor tenant, with his little family in his tinder-box habitation, would feel safer and happier. For humanity's sake, then, may we not fondly hope for equal recognition with the lower and more valuable animals and live to see the time when societies for the prevention of cruelty to humanity will be just as popular as those for the prevention of cruelty to animals.

Municipal commissions for the examination of buildings, and corner's juries are inefficient and uncertain, and it would seem that righteous sentiment, outraged by the total indifference shown to the constantly-occurring warnings, must sooner or later become aroused, and remodel or obliterate in our buildings all vestiges of such glaring causes for alarm; instituting, as we before ventured to suggest, some practical factor of safety which the present or modern character of our houses necessitate, and which will entirely revolutionize old theories and establish a rule that would prove infallible throughout the land. When that sensible time arrives, and this danger is, as far as possible, avoided, we feel humbly certain that such simple subjects as "Steps and Stairs" will be found invested with the importance they so justly deserve, and the influence and power they may exert, in the construction of buildings, will be universally paramount and peremptory: second to none.

POISONOUS PIGMENTS AND WALL-PAPERS.

ABOUT a year ago the National Health Society solicited Earl Granville to instruct the representatives of the Foreign Office abroad so that they might obtain reports respecting foreign enactments for the limitations, restrictions, or safeguards in the manufacture, use, and sale of arsenical and other poisonous colors used for wall-papers and other decorative purposes. A circular was accordingly addressed to the representatives by His Lordship. The reports which were received have been printed, and will be found interesting to sanitarians. The following abstract will suggest the state of opinion on so important a subject:—

In Austria there is no direct prohibition against the production of arsenical and other poisonous pigments; but the manufacturers require a license and special permission for the establishment of such a business, and precautionary measures have to be adopted by them for the protection of the workmen. The Austrian authorities are considering certain proposed stipulations by which the employment of colors made of arsenical substances will not be allowed in artificial flowers, wall-papers, colored paper, and dressing stuffs, and the importing of all articles in which arsenical pigments are used is to be illegal. An Imperial law

was passed in Germany in 1879, in order to regulate the sale of all articles containing poisons, but there has been more or less uncertainty about the interpretation of some of the enactments. A committee of the Reichstag have recommended that the words "prepared with arsenic" should be used instead of the words "containing arsenic," as by this means colors only to which arsenic had been added would be forbidden, whereas others containing very slight blendings of arsenic through accidental circumstances, such as earth colors, would be permitted. In the decree of the Emperor which came into force, it is accordingly ordained that the use of "colors prepared with arsenic" is forbidden in the manufacture of paper-hangings. The punishment for contravention is severe, and, in case of severe bodily injury or death to a human being, it may extend to five years' penal servitude. The Imperial law in no way interferes with the regulations which have been adopted in the several states. In Baden not only are arsenical wall-papers illegal, but there is a prohibition against the tinting of walls or ceilings of dwelling-houses or factories with arsenical compounds. The Hessian police code imposes a penalty of from one to thirty florins on any person who, for the purpose of furnishing or covering the walls of any dwelling-room, employs paints, wall-papers or stuffs tinted with any of the pigments which are designated as "injurious to health," such as Scheel's green, Schwemfurt green, and King's or Naples yellow, and all colors containing arsenic or combinations of arsenic. The use of these colors for tinting furniture is likewise prohibited.

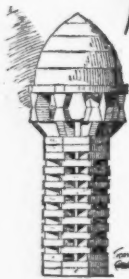
Regulations against arsenic and other dangerous paints have been in force in Saxony for many years. In 1856 the people were warned against a red pigment known as Munich red, cochineal red, and Pernambuco lake (Brazil red), and used for paper-hangings, colored paper, and for staining. Again in 1868 a warning was issued against window-blinds colored with various arsenicated pigments, which, being applied in a very superficial manner, were easily detached from the blinds as powder, so that the air became impregnated with poisonous molecules. According to the Saxon authorities, poisonous colors are prejudicial to health when not properly applied to the surface of the papers, or when not smoothed down or not varnished, or if the hangings are applied to damp walls to which they do not hold firmly, so that the pigment is liable to flake or dust off. But those colors are innocuous when applied to the walls of rooms if the walls are and remain dry, if the wall is dry before the painting, and the lime used is mixed with milk not over-diluted, or the color when dry is washed with a suitable fluid, such as water-glass, etc. Colors of this class, especially the more injurious, viz., the greens and blues, should be altogether excluded from sleeping-apartments, as well as from workrooms in which the air is highly saturated with aqueous vapor, or impregnated with the fumes of vinegar, ammonia, chlorine, sulphuric acid, etc.

Poisonous colors when used in carpets or wall-papers are attended by exceptional risk in Sweden, as the inhabitants live during winter in apartments which are almost hermetically sealed. A statute was issued by the King in 1876, which prohibits the manufacture and importation of arsenious acid or white arsenic in Sweden, unless the royal permission has been obtained. Wall-paper, window-blinds, Venetian-blinds, tissues, artificial flowers, or other articles in water-color, printed or painted in colors containing arsenic, are not to be kept or offered for sale. An elaborate list of poisonous colors has been prepared by the Swedish Board of Health, but the term "poisonous" does not seem to have a strict definition. Thus, for example, we find among the white colors considered to be obnoxious, bismuth-white and zinc-white, while a note states: "These colors when used as paints are perfectly harmless. Bismuth, even when followed in large doses, is inert, and the substitution of zinc whites, albissima, Charlton white, silicate paints, etc., for white lead is much to be desired."

It is also said that arsenic has been discovered in other colors besides the green-copper colors, such as some of the most beautiful of the red-drop colors, various gray colors used in printing wall-papers, and in tar-colors. According to the law of Denmark, arsenical preparations may not be used for staining, dyeing or coloring stuffs, window-blinds, Venetian-blinds, artificial flowers, lamp-shades, paper, etc., nor form part of a pigment mixed with glue, gum, size, dextrin, white of egg, etc., for walls of rooms or wall-papers.

The Russian code of laws prohibits the importation as well as the manufacture in Russia of all wall-papers which are covered with a thick coating of arsenical coloring matter, both opaque and glazed. There is an exception in favor of paper in which the pattern is traced in arsenical paint on a more extensive ground of non-arsenical coloring matter. Lists of injurious colors and harmless colors have been prepared, and the following plain method for detecting the presence of arsenic in articles colored or dyed has been issued:—

For the purpose of testing green and other wall-paper, in which the presence of arsenic is suspected, a small piece of such paper should be taken and cut into shreds, which are then to be placed in a wine-glass. If the object of examination be coloring matter, a piece of the size of a pea should be taken and treated in the same manner; if a piece of tissue is under examination, a small shred of it should be cut off. The piece of paper, dye-stuff, or tissue must be treated with caustic alkali (solution of ammonia), a teaspoonful of which must be poured over the object of examination. The liquid will assume a blue color, and, after five or ten minutes, half a teaspoonful of pure hydrochloric acid (chemically pure), which will give the liquid a light green hue, must also be poured into the glass. Finally,



a piece of copper or a copper coin, previously polished with sand, is placed in the green liquid. If after the expiration of five minutes the copper shows on its surface a gray, glistening deposit, then the wall-paper, dye-stuff or tissue contains arsenic; but if the surface of the copper remains red, there is probably no arsenic present. It must, in addition to this, be observed that all articles colored with arsenical paints emit, when burnt, a smell of garlic.

While so many countries have adopted measures to protect the inhabitants against poisonous colors, there are others which are as indifferent as England. France has no regulations, except in the case of articles of food, beyond a circular which has been issued by the Minister of Commerce cautioning manufacturers, and explaining the responsibility they would incur in the event of accidents arising from the use of poisons. Belgium is also without a decree to restrict or regulate the manufacture, use, or sale of arsenical or other poisonous pigments employed in industry or in the decorative arts. The same may be said of Greece, Italy, Holland, Portugal, Spain and Switzerland. There is no federal law on the subject in the United States, and it may also be asserted that there is no State legislation or municipal enactment bearing on the matter. — *The Architect*.

THE NASMYTH PILE DRIVER.



D. J. Whittemore, M. Am. Soc. C. E., said at the Annual Convention, St. Paul, Minn., held June 21, 1883: "Having used the Nasmyth steam hammer in driving piles in foundations for masonry at the La Crosse and Sabula bridges and for elevator foundations in Milwaukee, I wish to present some evidence of how far the effectiveness of this machine is dependent on keeping a firm head to the pile. Whenever the head of the pile becomes broomed from repeated blows of the hammer, though this brooming may not extend to a greater depth than from one-half to one inch, the useful effect of the blow is partly lost through the extreme elasticity at the pile head. The following data as to the driving of a green Norway-pine pile at Sabula illustrates how far this obtains. The pile was brought to its position between the leaders and dropped through 10 feet of water and penetrated the silt of the river bottom to a depth of two feet, and then the hammer commenced its work:—

The 3d foot of penetration required	5 blows.
" 4th "	" 15 "
" 5th "	" 20 "
" 6th "	" 29 "
" 7th "	" 35 "
" 8th "	" 46 "
" 9th "	" 61 "
" 10th "	" 73 "
" 11th "	" 109 "
" 12th "	" 153 "
" 13th "	" 257 "
" 14th "	" 684 "
Head adzed off.	
" 15th foot of penetration required	275 "
" 16th "	" 572 "
" 17th "	" 832 "
" 18th "	" 825 "
Head sawed off.	
" 19th foot of penetration required	213 "
" 20th "	" 275 "
" 21st "	" 371 "
" 22d "	" 378 "
Total number of blows,	5,228

"A pile of about the same size as the one mentioned above, driven near the same locality and to the same depth, but with no adzing or sawing off the head during driving, required 9,923 blows. The ram weighed 2,800 lbs. and dropped 36 inches, 65 times per minute.

"At Sabula, about 2 per cent of the 700 piles driven by this appliance ruptured slightly, just below the ring support at the head of pile, and the friction produced by the wood fibres working on each other under the repeated blows of the ram was sufficient to ignite and burn the heart of the head of the pile quite across."

HOUSES FOR THE GULF STATES.

LAKE DE FUNIAK, FLORIDA, March 21, 1884.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—As yet the South has developed no artistic style of architecture suited to its climate, but has copied from buildings designed for and used in colder climes, which are unsuited, and by no means appropriate for southern latitudes. Permit me to suggest to young architects, through your journal, a new field for their genius; namely, designs for villas and cottages suited for Florida and the Gulf States, to cost from \$500 to \$15,000. With lumber here at \$10 to \$12 per thousand, buildings should be constructed at low rates. No cellars are used here, and kitchens should be detached from ten to twelve feet from the main building. Plenty of piazza room is also a necessity. It is considered desirable to ceil living-rooms with our resinous pine. There are cases known of consumption being cured by living in rooms ceiled with our fat pine.

While we have a delightful summer climate here, free from

malaria and mosquitoes; with nights throughout the whole summer sufficiently cool to render a pair of blankets very comfortable and necessary, our winter evenings require fire, and the consumptives who come here for health from the North require artificial heat in their rooms for the first few weeks after their arrival. I mention this for the information of gentlemen who may desire to utilize my suggestions in designing homes for the Florida and southern climate. The Hon. C. C. Banfill, of Lake de Funia, Florida, desires to build several modern cottages, and might be addressed by those interested. Mr. Banfill will make a sort of winter Elberon at Lake de Funia.

SOUTHLAND.

THE ACCUMULATED HEAT OF LIBRARY-ROOMS.

BOSTON, March 31, 1884.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—My attention having been attracted to your comments upon Mr. W. F. Poole's pamphlet upon "*Library Architecture*," it occurs to me that some facts which have been developed in factory experience, may have a very practical application to this subject. One would infer from your comments, first, that the heat which is developed in the upper part of a room is of necessity in proportion to the height of the room; and second, that the intensity of the heat will of necessity be increased, if light is transmitted in any manner through the roof.

Now, while it is true that there are no rooms in factories corresponding precisely to a very high library room, yet I think that factory experience may be cited to disprove both the above inferences, if I have stated them correctly. The upper rooms of a factory of 100 feet in width, are apt to be 15 to 16 feet high in the centre, and one-story mills of 200 feet in width, are sometimes over 20 feet high in the centre: the area of the roof which is exposed to the sun, is therefore relatively much greater than in the library, and there would seem to be a reason for the development of a higher degree of heat within; yet there is no practical difficulty in making the upper story of the high mills, or the single room of the one-story mills, as warm in winter, and as cool in summer, with better ventilation, than is possible with respect to the lower story of the high mills. It is true that the motion of the machinery may in some small degree affect the circulation, but in upper rooms devoted to mule-spinning, there is very little shafting or belting, and in the centre of the one-story mill, all the machinery is far below the roof.

The whole question of the heat in summer, to which you refer as rendering the upper part of high library-rooms so detrimental in its condition, depends so far as factories are concerned, wholly upon the kind of material used, and the disposition which is made of it, both with respect to the roof itself, and to the transmission of light and air from above.

The ordinary roof-construction of other buildings than factories, whatever the shape of the roof may be; consisting of rafters set 12 to 18 inches on centres, covered with one-inch boards, and sheathed or plastered on the under side of the rafter is utterly bad, whether covered outside with slate, metal, or gravel; and is unutterably bad if the spaces between the rafters, or between the inner ceiling and the outer boarding are connected with vertical flues between the studding, and the outer vertical wall of the building. With respect to heat, an iron roof is the worst, and also least safe as to fire, of any.

Skylights which are slanted at the same angle with the slope of the roof, or constructed in the usual manner with two sloping sides, meeting at the top, are also, with respect to heat the worst possible forms of setting glass for the transmission of light from above; although perhaps giving a little more light than the monitor, which has been generally substituted in the construction of factories.

In factory practice it has been substantially proved that there is no substance of which a non-heat-conducting roof can be made so good as solid plank, not less than 3 inches thick in the best practice, covered outside with gravel and sheathed solid, or plastered on wire inside between the timbers. All air-spaces are condemned, because it is impossible to seal them hermetically; and if there is the least circulation, moisture generated in the mill permeates such spaces, where it condenses and destroys the wood both above and below.

On a pitched or hipped roof, matched boards may be used, if covered outside with shingles laid over mortar, and sheathed within with good sheathing laid solid at right angles to the roof boards, between the rafters.

Air-spaces in the roofs of common construction, inside of an outer covering consisting of unmatched boards and slates, or metalled outside, serve as *condensers of heat*, and as it is quite as true that cool air falls as it is that heated air rises, so it happens under the same law that makes overhead heating-pipes most effective in warming the air near the floor of a room, that the air which has been heated in the interspaces of the roof passes down through the vertical flues in the side walls, following the cooler air, which passes or falls out into the cellar with which these vertical flues are usually connected; and thus the whole interior of the structure is converted into an oven, which can be as you well remark, "heated in some parts to over 140°" by the condensing heat chambers in the roof so admirably designed for the purpose, as well as for the purpose of assuring the complete destruction of the building by fire, if fire ever catches in any part of the structure.

With respect to the transmission of light from above, the monitor glazed with double vertical windows—fitted to open for purposes of

ventilation, and roofed like the main structure with 3-inch plank, has proved to be entirely free from the objection which pertains to every other form of overhead light.

One question remains to be determined, so far as mill constructors have as yet any accurate knowledge, to wit: the relative values of different kinds of glass for excluding heat while transmitting light; and the exact or minimum distance which should exist between two panes of glass, when two are set in the same sash with an air-space between them. Without double glass, the moisture generated in the factory will condense in winter upon the windows of the monitor, then melt and drip, to the injury of machinery or of goods.

If you can give any facts bearing upon the question of what thickness or kind of glass is, on the whole, best for factory use, you will do a useful service. In modern English mills, rough plate-glass is in common use; it is said to transmit less light than common glass; but to diffuse it in a more useful way, free from glare. E. A.

NATURAL INCENDIARISM.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Two similar instances of danger from fire which if they had not been discovered in time, might have led to very serious results, and which would probably have been set down as "fires from unknown causes," have recently come to my notice. The first was in Boston, where three ladies were sitting in a room with a southern exposure. One of them was sure she perceived the presence of smoke, though on investigation there seemed no possible way in which smoke could find its way into the room. On further examination the smoke was seen to be rising from a table covered with a woollen cloth, on which was standing an ink-well having a base composed of four glass spheres. On the cloth were several badly scorched places, and the smoke had increased very perceptibly.

The other case was in a suburban town where an ink-well of the same kind was seen exposed to the direct rays of a southern sun. Investigation showed a very faint column of smoke rising, and a scorched spot on the raw-silk cover. A match held at the focus of the rays was instantly ignited, showing the presence of a very dangerous amount of heat. In each case the room was seldom used in the middle of the day, and if the ink-wells had stood on any material more combustible than raw-silk or woollen, or even if the same things had been exposed to a hot summer sun, great damage might have been done. Fires have been known to be set by the sun's rays being focalized by a fish-globe partially filled with water, and it seems that in the beautiful glass vases, ink-wells, paper-weights, etc., having spherical bases there is another source of danger against which we should guard most carefully.

W. A. RODMAN.

THE PER-CAPITA COST OF SOME GOVERNMENT BUILDINGS.

March 26, 1884.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Sirs,—I have been inquiring into the cost of providing space for the administration of the executive bureaus of our government in Washington. I reach the following results, which though not absolutely correct are at least approximately so; it is difficult to ascertain the exact distribution of a somewhat floating population of officials of all grades who do their work under the roofs of these executive buildings.

Very respectfully,

YOUR OBEDIENT SERVANT.

TREASURY DEPARTMENT BUILDING.—Cost, \$6,421,023; population, 1,934; cost per head, \$3,320.

Cost exclusive of grounds of some U. S. public buildings, with population, and cost per head of such population.

PATENT OFFICE OR INTERIOR DEPARTMENT.—Cost, \$2,650,000; population 1,000; cost per head, \$2,650.

GENERAL POST OFFICE.—Cost, \$1,882,000; population, 795; cost per head, \$3,320.

WEST EXECUTIVE BUILDINGS.—SOUTH FRONT, occupied principally by the State Department. Cost, \$3,373,939; population, 217; cost per head, \$15,548.

EAST WING.—Navy Department with some part of War Department force; cost, \$2,672,287; population, 483; cost per head, \$5,533.

NORTH FRONT.—Part of War Department; cost, \$1,910,773; population, 326; cost per head, \$5,831.

WINDUS BUILDING.—Cost, \$241,187; population, 290; cost per head, \$832.

NOTES AND CLIPPINGS.

SUIT ON A BUILDING CONTRACT.—**DEFENSE OF WANT OF SKILL.**—S sued B for \$492.63, the balance due him for building a two-story brick house, and B made a counter claim for defective material thrown out, and money expended in repairing the unskilful work of S. The contract price was \$2,535, and the plaintiff had been paid \$2,042.40; the counter claim was \$1,985, which the defendant got a judgment for. The defence to the counter claim was a most novel one: That the plaintiff had "no experience in laying foundations, as the defendant knew." The case—*Sherman vs. Bates*—was carried to the Supreme Court of Nebraska, where the judgment was affirmed. Judge Maxwell, in the opinion, said: "A party entering into a contract to construct a building thereby agrees that all parts of the structure shall be put up according to the agreement. As a defense to inferior workmanship he

cannot say, 'I am not a mason, or carpenter, or tinsmith; therefore I am not liable for defects caused by unskilful or careless workmen.' The question is not one of skill on the part of the contractor, but of compliance with the contract. If a contractor agreed to erect a building in a certain manner, he must comply with the agreement, and no plea of a lack of skill of himself or any of his workmen or sub-contractors will constitute a defense for a failure to comply with the contract. — *The Metal Worker*.

WESTMINSTER CATHEDRAL.—The Catholic See of Westminster is now in full legal possession of the site of its future cathedral, the present site of the Tothill Fields Prison having been legally conveyed to Cardinal Manning for this purpose. The size of the ground is 300' x 558'. The plans for the edifice will shortly arrive from Vienna. The prison building, according to contract, will have to be pulled down and removed within five months.

FRESH PAINT.—The current belief among householders that the smell of fresh lead paint is noxious is founded on pretty general experience, but is opposed by the belief, equally current among chemists, that lead compounds are not volatile. A fact recently brought to our notice seems to support the domestic theory. The basis of the useful and popular luminous paint is known to be sulphide of calcium. Now, this compound, when unprotected by varnish, glass, or some other impervious substance, is slowly acted on by the acids of the air, and sulphureted hydrogen is evolved, which blackens lead paint. This is well known, and can easily be avoided by proper protection of the paint; but the curious thing is that unprotected luminous paint is found to be perceptibly blackened by the fumes from fresh lead paint. There seems to be only one possible explanation of this—namely, that a surface freshly covered with lead paint does actually emit some volatile compound of lead. We believe that many physicians could confirm this view from their own observations in regard to newly-painted houses. — *Lancet*.

DRAINING THE ROMAN CAMPAGNA.—The Government of Rome has been much, and no doubt deservedly, abused for many of the public works which, with more zeal than discretion, it has ordered to be carried out, but it seems that in some very important respects its action last year was wise and beneficial. Vice-Consul Franz tells us that in the course of 1883, after long discussions, it was found possible to carry an important measure providing for the improvement of the country in the vicinity of the Eternal City. This last law is in continuation of an act passed in 1878 for the amelioration of the Roman Campagna, which has so long been the chief bane of Rome from a sanitary point of view. In that year the drainage of the marshes and ponds existing in the Campagna was decided upon, and plans were ordered to be made for collecting the springs and subsoil waters, and for effecting a regular canalization by which they could be carried off. This has, however, proved a work of time, and not much practical effect has followed, so that the Legislature found itself compelled last year to order the scheme to be recommenced on a more limited scale. With this object, that part of the Campagna which is within a radius of six miles from the Forum has been selected for the first experiments. It constitutes about a seventh of the whole marsh district, of which the total extent is about 525,000 acres. The proprietors are to present a report suggesting the nature of the improvements to be made, and their suggestions will be considered by a special committee, which will afterwards determine what is to be done. The land owners will then be required to carry out the works, under pain of seeing their property forfeited if they do not comply. There is thus some hope of seeing the Campagna before long converted from a hot-bed of malaria into a fertile and habitable district.—*The London Globe*.

BUILDING HOUSES IN PARIS.—M. Christophle, Governor of the Crédit Foncier, was heard this afternoon by the Industrial Crisis Committee. According to him, the allegations concerning the building crisis are much exaggerated. This statement, frequently repeated, is that from 7,000,000,000*f.* to 8,000,000,000*f.* worth of houses have been built in the last few years. M. Christophle thinks 1,200,000,000*f.* or 1,300,000,000*f.* nearer the mark. The total number of houses in Paris—viz., 76,000—represents only 12,000,000,000*f.* During the last nine years the Crédit Foncier has lent for building purposes in Paris 819,000,000*f.*—viz.: in 1874, 17,000,000*f.*; in 1875, 36,000,000*f.*; in 1876, 35,000,000*f.*; in 1877, 31,000,000*f.*; in 1878, 43,000,000*f.*; in 1879, 40,000,000*f.*; in 1880, 151,000,000*f.*; in 1881, 153,000,000*f.*; in 1882, 179,000,000*f.*; and in 1883, 134,000,000*f.* Of the above total half, he said, had been lent on buildings already existing. This gave 400,000,000*f.* lent for new buildings; and as the Crédit Foncier lent two-thirds of the value, the value of the new buildings constructed in Paris since 1874 might be estimated at 600,000,000*f.* M. Christophle further stated that the Crédit Foncier never was compelled to foreclose the mortgages. To find the total cost of the new houses in Paris, the 600,000,000*f.* ought to be doubled, so that, according to the Governor of the Crédit Foncier, the total expenditure on building in Paris, during the last ten years, has been 1,200,000,000*f.* While M. Christophle was giving this evidence the Paris Municipality was discussing the convention concluded last summer by the Government with the Crédit Foncier, whereby the latter agreed to advance money on first mortgage, and a municipal guaranty to any person building houses with apartments, half of which did not bear more than 300*f.* rent. This scheme was received with scant courtesy by the Municipality, jealous, apparently, of being forestalled by M. Ferry in the practice of State Socialism, and was shelved for many months by being referred to a committee. The committee, however, at length reported on it, and to-day the Municipality rejected it by 35 to 26 votes. A string of Socialist schemes, such as the construction of cheap houses by the Municipality itself, premiums to owners of apartments with fixed and low rents, etc., were likewise rejected, none of them mustering more than half a dozen or a dozen votes. It was resolved, however, to erect four blocks of houses as an experiment, and to offer municipal land, on twenty-five years' building leases, for houses of specified rents.—*London Times*.

(Reported for The American Architect and Building News.)

BUILDING PATENTS.

295,223. HAND-BORER. — Willard E. Clough, Concord, N. H.
295,224. BORING-MACHINE. — Willard E. Clough, Concord, N. H.
295,225. COMPOUND FOR WATER-PROOFING AND PRESERVING BUILDINGS. — Benjamin DeNise, Camden, N. J.
295,227. FIRE-ESCAPE. — Robert Emiah Downey, Clinton, O.
295,530. NAIL-FASTENER. — Samuel Farquhar, Newton, Mass.
295,537. WEATHER-STRIP. — Eugene E. Gillett, Western Union, Wis.
295,541. SHINGLE SHAVING AND RIFTING MACHINE. — Appleton Gould, Bangor, Me.
295,554. BRICK-MACHINE. — Philip Henry Kells, Adrian, Mich.
295,570. FIRE-ESCAPE. — Abraham W. Lozier, New York, N. Y.
295,571. CLAW-BAR. — William H. Lyman, Springfield, Mo.
295,574. ATTACHMENT FOR SCAFFOLDING. — John T. O'Brien, Philadelphia, Pa.
295,575. EXTERIOR AND EXTERIOR SCAFFOLDING. — John T. O'Brien, Philadelphia, Pa.
295,584. COMBINED DOOR-PLATE AND MAIL-RECEIVER. — Robert G. Pace and Walter J. Wey, Lynchburg, Va.
295,582. HANDLE FOR DIAL-LOCK KNOBS. — Tracy L. Paine, Milwaukee, Wis.
295,589. CABINET-MAKER'S CLAMP. — William E. Shedd, Jr., Medford, Mass.
295,592. SCAFFOLDING. — Thomas N. Subers, Philadelphia, Pa.
295,594. SAFETY-WINDOW. — Friedrich Oskar Thiem, Leipzig, Germany.
295,604. ROOFING-COMPOSITION. — Welcome White, Everett, Mass.
295,630. NAIL-BALANCE. — Mahlon B. Gladman, Hopkins, Mo.
295,531. FIRE-ESCAPE. — Laura J. Gott, La Grange, Ohio.
295,667. LUNBER-KILN. — Ephraim Myers, Suspension, Ala.
295,678. SAFETY-STOP FOR ELEVATORS. — Ellison Saunders, Austin, Tex.
295,686. ELECTRIC HOT-AIR FURNACE REGULATOR. — Frank Miller Sparrow, Matapoisett, Mass.
295,687. CHIMNEY-COWL. — Emil K. Stasch, Corning, N. Y.
295,691. WATER-CLOSET VALVE. — Henry A. Tobey, Dayton, O.
295,692. BEAM. — Albert Trochser, Boston, Mass.
295,709. FRICK-RADIATOR. — Elsiea T. Weymouth, Brooklyn, N. Y.
295,722. SHINGLE-SAWING MACHINE. — Samuel L. Boring, Big Creek, Miss.
295,723. FIRE-ESCAPE. — Virgil W. Blanchard, New York, N. Y.
295,743. HANGING-DOORS. — Charles W. Emerson, Charlestown, Mass.
295,744. BRICK AND TILE KILN. — William A. Eudaly, Cincinnati, O.
295,793. DOOR-LATCH. — Willard F. Oliver, Lynn, Mass.
295,797. RATCHET-WRENCH. — Adelbert E. Osborn, Waco, Tex.
295,817. DUPLEX BRACE-HINGE. — Amos W. Sangster, Buffalo, N. Y.
295,823. SEWER-BASIN. — William Sievering, Newark, N. J.
295,833. WOOD-SCREW. — George A. Stiles, West Gardner, Mass.
295,847. SADDLE-BOARD. — Joseph A. Wilson, Chester, N. Y.
295,864. BRICK AND TILE KILN. — William A. Eudaly, Cincinnati, O.
295,871. BRICK AND TILE MACHINE. — Abraham Horrocks, Bardolph, Ill.

Baltimore.

W. O. Singer, three-st'y brick building (square) and
two-st'y brick stable in rear, w s Fremont St., n of
Winchester St.
D. Kroll, three-st'y brick building (square), w s
Belair Ave., n of Federal St.
C. L. & J. S. Clark, 5 three-st'y brick buildings, w s
Eden St., s of Oliver St.
J. L. B-wen, 27 two-st'y brick buildings (square),
w s Washington Ave., between Cross and Stock-
holm Sts.
The Pratt Library, one-st'y brick building, cor.
O'Donnell and Canton Sts.
St. Vincent's Infant Asylum, three-st'y and base-
ment brick building, n e cor. Division and Townsend
Sts.
Wm. Hempel, three-st'y brick building, e Gay
St., between Monument St. and Central Ave.

Boston.

Brooklyn, N. C. 651, e. s. 50' n. Yates Pl., three-story brick store and flats, tin roof, iron cornice; cost, \$8,500; owner, Nathan Levy, Broadway, c. r. Division Ave.; architect, Th. Engelhardt; builders, Geo.

Brooklyn.

Broadway, No. 657, e. s. 50' n Yates Pl., three-st'y brick store and flats, tin roof, iron cornice; cost, \$8,500; owner, Nathan Levy, Broadway, c. r. Division Ave.; architect, Th. Engelhardt; builders, Geo.

Clifton Pl., s s, 320' w Nostrand Ave., 15 two-st'y
Connecticut brown-stone dwells., tin roofs; cost

J. D. Jennings, five-story addition to building, 213
Wabash Ave.; cost, \$35,000; architect, C. Chapman
builder, J. Clark.

A. Muller & M. Schneider, 2 three-sty stores and flats, 3823 and 3825 State St.; cost, \$14,000; architect, J. Doerff; builder, A. Muller.

A. Diesel, 2 three-sty stores and dwells, 2422 and 2424 Wentworth Ave.; cost, \$12,000; architect, J. Frank; builder, A. Mueller.

C. H. McCormick, five-sty store, 227 and 229 Lake St.; cost, \$16,000; architect, M. F. Colton; builder, W. Harton.

M. W. Powell & Co., two-sty dwell., 202 and 204 Sixteenth St.; cost, \$3,000.

D. Conidine, three-sty flats, 351 Indiana St.; cost, \$6,000; architect, J. Otter.

J. Clark, three-sty store and flats, 1718 and 1720 State St.; cost, \$18,000.

Tammany Beer-Hall, one-sty beer-hall, 239-243 State St.; cost, \$18,000.

C. T. Neuffer, three-sty store and dwell., 206 West Twelfth St.; cost, \$5,000; architect, A. Bessler.

J. Eggold, two-sty store, 578 Larrabee St.; cost, \$4,000.

C. H. McCormick Harvesting Co., shelter-shed; cost, \$3,500.

D. S. Streeter, two-sty flats, Van Buren St.; cost, \$7,000; architects, Wheelock & Clay.

J. J. Harrington, three-sty store and flats, 284 Illinois St.; cost, \$10,000.

W. S. Moss, two-sty dwell., 3678 Michigan Ave.; cost, \$10,000; architect, J. C. June.

J. H. Smith, three-sty stores and flats, 372 and 374 Wells St.; cost, \$18,000; architect, L. G. Halberg.

H. Janner, two-sty store and dwell., 79 West Thirtieth St.; cost, \$4,000.

F. Becker, two-sty dwell., 23 West Thirtieth St.; cost, \$2,500.

G. Lobstein, two-sty dwell., 109 Hastings St.; cost, \$2,500.

J. Smith, two-sty store and dwell., 47 Hastings St.; cost, \$4,000.

Pioneer Fire-Proof Construction Company, two-sty office-building, 1545 Clark St.; cost, \$5,000.

Johnson & Kemple, 3 one-sty stores, 482-486 West Randolph St.; cost, \$5,000.

Wm. Holsche, two-sty dwell., 83 Lewis St.; cost, \$3,000.

N. C. C. Railway Co., two-sty addition to barn, Larrabee St.; cost, \$10,000.

N. C. C. Railway Co., additional store, Larrabee St.; cost, \$17,000.

G. Z. Work, two-sty dwell., Dearborn St.; cost, \$10,000.

Oliver & Hill, two-sty dwell., Thirty-seventh St.; cost, \$3,500.

J. B. Breese, one-sty building; cost, \$70,000.

L. Wolf, four-sty stores and factory, 26 North Jefferson St.; cost, \$26,000; architect, Fred. Wolf.

Mrs. A. Baldwin, 2 two-sty flats, 296 and 298 Park Ave.; cost, \$7,500.

E. Gloss, three-sty dwell., 900 Milwaukee Ave.; cost, \$6,000.

Cincinnati.

CHAMBERS.—The West Walnut Hills Catholic Society are about to build a new limestone church on Gilbert Ave., from plans prepared by Mr. A. C. Nash, architect; cost, \$3,000.

The contract for the Mt. Auburn Baptist Church was recently let to L. H. Wilson, for \$21,000. The church is to be of limestone, and will seat about 400; Chas. Crapsey, architect.

CLUB-HOUSE.—The Latonia Jockey Club are to build a new club-house on their driving park, back of Covington, Ky. Mr. A. C. Nash, architect; cost, \$14,000.

CONCERT HALL.—Mr. McLaughlin has in hand a concert hall to be built for the College of Music. The building is an addition to the present series, and has no street front; therefore, the exteriors are plain brick. Audience room, 60' x 85'; stage, 40' x 60'; foyer, 25' x 65'; promenade corridor, 14' x 180'; cost about \$40,000.

FACTORY.—The Krebs Lithographing Co. are to build a new factory on Sycamore St., costing \$25,000.

PAVILION.—The Cincinnati Base Ball Co., are building new pavilions, etc., cor. of Dayton St. and Western Ave.; Chas. Crapsey, architect; cost, \$9,000.

SCHOOL-HOUSE.—For Miss Nourse, a private school-building on Gilbert Ave. Frame, cost, \$7,000; J. W. McLaughlin, architect.

SHEEP-PENS.—For the Union Stock Yards Co., to rebuild the sheep-pens that were destroyed by the recent floods. Frame, three-sty, 144' x 480'; cost, \$3,000; J. W. McLaughlin, architect.

STORE AND OFFICE-BUILDING.—Henry Brauns, architect, Baltimore, is preparing drawings for a six-sty brick, stone, and terra-cotta building, 42' x 134', to be erected cor. Fifth and Main Sts., (Thom's Block).

STORE.—For Mr. L. B. Harrison, a store on Race St., above Fourth, 30' x 14', five-sty high, pressed-brick front; cost, \$35,000; J. W. McLaughlin, architect.

THEATRE.—It is rumored that there is to be a new temple erected for the drama. The structure (if it materializes) is the outgrowth of the dramatic festival which is given every year or two in the Music Hall. The paper states that one man (who will not for the present make himself known) has signified his intention of giving \$100,000 towards the project. A visit to most of the architects of the city develops the fact that there is plenty of work for all.

HOUSES.—Mr. Geo. W. Kapp, architect, has prepared plans for a two-sty brick dwell. for Felix Bahman, to be erected on Woodburn Ave., opp. Chase St., 35' x 60'; cost, \$9,000.

For Louis Bailant, Esq., two-sty double brick dwell., 45' x 65'; cost, \$10,200; pressed-brick front, Crippen St., near Nassau St.

For the Walnut Hills Club-House, an addition of Parlor Billiard Room, Bowling Alley, etc.; cost, \$4,000.

For W. H. Forwood, brick dwell., Ashland St., Walnut Hills; cost, \$8,000; C. Crapsey, architect.

For Mrs. J. C. Hussey, frame dwell., at Avondale; cost, \$7,000; C. Crapsey, architect.

ALTERATIONS.—For Dr. J. I. Taylor, alterations and additions to s. e. cor. of Seventh and Elm Sts. Turning the present dwelling into stores and flats; cost, \$9,000; C. Crapsey, architect.

Detroit.

BUILDING PERMITS.—Permits granted since our last report are as follows:—

N. H. May, brick dwell., 319 Thirtieth St.; cost, \$3,000.

R. Helson, frame house, 67 Hancock Ave.; cost, \$9,000.

U. S. Express Co., brick barn, East Woodbridge St.; cost, \$1,500.

G. W. Lloyd, 2 brick stores, Woodward Ave.; cost, \$30,000.

John Waterfall, brick house, 557 Cass Ave.; cost, \$6,000.

A. C. Varney, brick house, 738 Second St.; cost, \$4,500.

Martin Maier, brick factory, Twenty-first St.; cost, \$15,000.

Roberts Dunn, brick house, Congress St.; cost, \$4,000.

W. H. McLauslaugh & Son, brick house, Sixteenth St.; cost, \$2,500.

Jos. Wolf, brick store, 609 Michigan Ave.; cost, \$3,000.

Mason & Rice, frame house, Warren Ave.; cost, \$9,000.

Spetzley Bros., church, St. Aubine Ave.; cost, \$62,000.

W. S. Nicholson, frame house, Turnbull Ave.; cost, \$3,700.

Leduc & Martin, 2 frame dwells., Russell St.; cost, \$4,000.

Julius Hess, 2 brick houses, Hancock Ave.; cost, \$12,000.

Board of Education, school-house, German St.; cost, \$12,000.

W. G. Vinton & Co., additions to store, Woodbridge St.; cost, \$3,000.

Jos. Deitz, brick house, 47 Lafayette Ave.; cost, \$4,500.

Leo Schuble, brick house, Beaubine St.; cost, \$3,400.

Julius Hess, stables, West Congress St.; cost, \$10,000.

John Waterfall, brick house, 600 Cass Ave.; cost, \$7,000.

New York.

OFFICE-BUILDING.—The Standard Oil Co., have purchased another lot on Broadway, giving them a frontage on that street of 87'. Mr. E. L. Roberts and Mr. J. M. Farnsworth are still at work on the plans.

STORES.—For the Wetmore estate a brick and stone store, 15' x 25', is to be built on the n. w. cor. of Fourteenth St., and Sixth Ave., from designs of Mr. Chas. D. Marvin.

For the Marquis de San Marzans, a five-sty iron front store, 25' x 90', is to be built at No. 66 Grand St., at a cost of about \$25,000; from designs of Mr. W. H. Hume.

BUILDING PERMITS.—Ninety-eighth St., n. s., 200' e Ninth Ave., five-sty brick tenement, tin roof; cost, \$16,000; owner, James F. Chamberlin, 1691 Bathgate Ave.; architect, John Sexton; builders, W. C. Hanna & Son, and P. Billenger.

Fifty-ninth St., n. e. cor. Ninth Ave., five-sty brick store and tenement, tin roof; cost, \$14,000; owner, Mary J. Odell, 48 West Thirty-third St.; architect, John Sexton; builder, E. H. Miller.

One Hundred and Second St., n. s., 130' e Third Ave., 15 five-sty brick tenements, tin roofs; also One Hundred and Third St., s. s., 10' e Second Ave., 6 five-sty brick tenements, tin roofs; cost, each, \$16,000; owner, Michael Duff, 156 East One Hundred and Second St.; architect, A. Spence.

East Fifty-third St., No. 313, five-sty brick tenement, tin roof; cost, \$13,000; owner, Alfred Erbe, 65 Second Ave.; architects, Thom & Wilson.

Jay St., No. 20, five-sty brick tenement, tin roof; cost, \$9,500; owner, H. H. Kingslake, Greenwich St., s. w. cor. Jay St.; architect, C. F. Kidder, Jr.

West Fifty-fifth St., No. 552, five-sty brick tenement, tin roof; cost, \$12,000; owner, Robert Thompson, 552 West Fifty-fifth St.; architect, C. F. Kidder, Jr.

West Forty-ninth St., No. 431, five-sty brownstone tenement, tin roof; cost, \$9,000; owner, John Karl, 431 West Forty-ninth St.; architect, C. F. Kidder, Jr.

Eleventh Ave., e. s., 74' 10" N Thirty-seventh St., three-sty brick machine-shop, tin roof; cost, \$3,200; owner, Henry Heather, 325 West Twenty-ninth St.; architect, C. F. Kidder, Jr.

Tenth Ave., No. 419, rear, four-sty brick tenement, tin roof; cost, \$6,500; owner, Robert Muh, 748 Ninth Ave.; architect and builder, Judson Lawson.

First Ave., n. w. cor. Seventy-second St., five-sty brick store and tenement, tin roof; cost, \$36,000; owner, architect, and builder, Denis J. Dwyer, 312 East Fifty-seventh St.

First Ave., w. s., 48' 20" N Seventy-second St., 2 five-sty brick stores and tenements, tin roofs; cost, each, \$16,000; owner, James Fee, Greenville, Jersey City; builder, J. H. Valentine.

Madison Ave., w. s., 25' 50" N Sixty-fifth St., one-sty brick and brownstone synagogue; cost, \$65,000; owner, Bnai Jesurum Synagogue, Moritz Cohn, President, 256 West Twenty-third St.; architects, R. Gustavino, Schwarzmann & Bachman.

Ninth Ave., n. w. cor. Fifty-first St., five-sty brick store and tenement, tin roof; cost, \$18,000; owner, Elise Letzelter, 765 Ninth Ave.; architect, J. Kastner.

Thirty-first St., s. s., 62' e Fourth Ave., five-sty brick apartment-house, tin roof; cost, \$20,000; owner, James McFarlan, One Hundred and Forty-fourth St. and Southern Boulevard; architect, J. E. Ware.

Eighth Ave., w. s., 25' 10" N Thirtieth St., 2 five-sty brick apartment-houses, brick or tin roofs; cost, each, \$18,000; owner, Pearson S. Haisland, 131 East Seventieth St.; architect, J. E. Ware.

W. at Fortieth St., No. 311, six-sty brick factory; cost, \$16,000; owners, Archibald and John Culbert, 341 East Forty-second St.; architect, M. L. Ungrich.

First Ave., s. w. cor. Sixty-fifth St., 6 five-sty brownstone stores and tenements, tin roofs; total cost, \$108,000; owner, John C. Umberfield, 409 East Fifty-third St.; architect, A. B. Ogden.

Mulberry St., Nos. 5, 7 and 9, six-sty and cellar

brick factory, tin roof; cost, \$15,000; owner, William Nelson, 24 Old Slip; architect, F. Jenuth.

West Fourteenth St., Nos. 132, 134, and 136, nine-sty brick and Ohio terra-cotta store and tenement; cost, \$75,000; owner, William P. Douglas, Little Neck, L. I.; architect, F. S. Copley.

Eleventh Ave., n. e. cor. Thirty-seventh St., 4 five-sty brick tenements, tin roofs; cost, one \$13,000, and three, each \$10,000; owner, Rosalie Steinhart, 239 West Twenty-fourth St.; architect, Judson Lawson.

Broome St., No. 123, five-sty brick tenement, tin roof; cost, \$13,000; owner, Wm. Sternkopf, 26 Attorney St.; architect, Julius Boeckel.

First Ave., e. s., 25' N One Hundred and Eleventh St., two-sty brick gas purifier, slate roof; cost, \$18,000; owner, Harlem Gas Light Co., One Hundred and Tenth St. and First Ave.; architect and contractor, T. F. Rowland; builder, Richard Deeves.

One Hundred and Eleventh St., n. s., 82' e First Ave., one-sty brick engine-house, slate roof; cost, \$20,000; owner, architect, etc., same as last.

First Ave., s. w. cor. One Hundred and Tenth St., brick enclosure for gas-tank; cost, \$30,000; owner, architect, etc., same as last.

Twenty-eighth St., n. s., 236' w Seventh Ave., five-sty brick factory, gravel or tin roof; cost, \$8,000; owner, Mary Smith, 136 West One Hundred and Twenty-second St.; architects and builders, Bartlett & Smith.

East One Hundred and Twenty-third St., No. 206, three-sty brick stable, tin roof; cost, \$3,000; owner, Charles Merisch, 2264 Third Ave.; architect and builder, Bart. Walther.

West Twenty-ninth St., Nos. 512 and 514, 2 five-sty brick tenements, tin roof; cost, \$15,000; owner, G. M. Barretto, 438 West Fifty-seventh St.; architect, F. Brinkerhoff; builders, John A. O'Connor & Co.

One Hundred and Thirty-eighth St., s. s., 72' e Southern Boulevard, two-sty brick dwell., gravel roof; cost, \$5,000; owner, Mary Phelan, One Hundred and Thirty-eighth St., and Southern Boulevard; architect, Chas. Baxter; builder, P. Wheelan.

One Hundred and Thirty-eighth St., n. s., 25' e Willis Ave., three-sty brick dwell., tin roof; cost, \$12,000; owner, Anna M. Bradley, One Hundred and Thirty-eighth St.; architect, John Rogers; builders, Smith Bros., and E. Gustavson.

Rivington St., s. e. cor. Sheriff St., five-sty brick tenement and store, tin roof; cost, \$10,000; owner, John McCullough, 91 East Fourth Ave.; architect, John A. Remer; builder, Thomas Brennan.

East One Hundred and Eleventh St., Nos. 169 to 173, 5 four-sty brick flats, tin roofs; cost, total, \$80,000; owner, Joseph H. Beams, 253 Washington St.; architect, Julius Kastner.

East Seventy-ninth St., No. 52, four-sty brownstone front dwell., tin roof; cost, \$22,500; owners, Jacob and Samuel Cohen, 360 East Fifty-fifth St.; architects, Thayer A. Robinson; builders, List & Lennon, and Jas. J. Garland.

Eighty-third St., s. s., 175' e Ninth Ave., 2 four-sty brownstone front dwells., tin roofs; cost, each, \$25,000; owner and builder, Richard Deeves, 242 East Thirtieth St.; architects, D. and J. Jardine.

East Forty-third St., s. w. cor. Spring Pl., four-sty frame dwell., slate and tin roofs; cost, \$10,000; owner, Ernest Hall, on premises; architect, Theo. E. Thomson.

East Twenty-fourth St., No. 234, five-sty brick tenement, tin roof; cost, \$15,000; owner, Edward Mulvany, 170 East Seventieth St.; architect, John Sexton.

Seventy-fourth St., s. s., 85' w Third Ave., two-sty brick dwell. and store, tin roof; cost, \$3,500; owner, Ralph Irving, 1274 Third Ave.; architect, John Brandt.

First Ave., n. w. cor. One Hundred and Third St., 4 five-sty brick tenements and stores, tin roofs; cost, each, \$12,000; owner, John Simon, 136 Christie St.; architect, Julius Boeckel.

ALTERATIONS.—Stuyvesant St., Nos. 30 and 32, and 213 and 221 Ninth St., five-sty brick extension, tin roof, etc.; cost, from \$5,000 to \$7,000; owner, James L. Plympton, 30 Stuyvesant St.; builder, John Moran.

Broadway, No. 149, stairs shifted, and new store front, iron-work; cost, \$5,000; agent for trustees, F. Fish, 149 Broadway.

West Eleventh St., No. 141, add one story, tin roof; also, four-sty brick extension, tin roof; cost, \$9,000; owner, Chas. J. Fagan, 210 Waverly Pl.; architect and builder, S. McMillan.

Cedar St., No. 60, sub-divide each floor; cost, \$9,000; lessees, Satterlee, Bostwick & Martin; architect, E. A. Sargent; builders, K. Moore, and Robinson & McDowell.

Philadelphia.

BUILDING PERMITS.—Reese St., e. s., n Cambria St. 2, two-sty dwells., 4' x 28'; Albert Heinke, owner.

Broad St., cor. Diamond St., 8 three-sty dwells., four 19' x 71', four 19' x 58'; Jno. Sharp, owner.

Boynston Ave., s. w. of Wister St., two-sty factory, 44' x 145'; J. D. Caldwell.

Thirteenth St., cor. Powelton Ave., Hon. Louis Emery proposes to have erected a house from plans by Lindley Johnson, architect.

Venango St., e. s., bet. Richmond and Lambert Sts., 5 two-sty dwells., 13' x 40'; Amos W. Linn, contractor.

Clearfield St., n. s., bet. Emerald St., and Frankford Road, two-sty dwell., 17' x 48'; Charles E. Reese, owner.

Twenty-first St., e. s., s Tioga St., 5 three-sty dwells., 16' x 55'; W. Garvin, contractor.

Lancaster Ave., cor. Thirty-second St., exhibition building, 200' x 282'; J. B. Garber, contractor.

Duane St., cor. Oakland and Adam Sts., 27 two-sty dwells., 16' x 34'; W. H. Brunner, contractor.

Market St., n. s., w Forty-second St., 2 two-sty dwells., 14' x 46'; Michael Dehaven, owner.

Fifth St., cor. South St., store and dwell., 14' x 50'; Marriner & Buckingham, contractors.

Allen Lane, on Philadelphia, Germantown & Chesnut Hill R. R., one-sty station, C. D. Supplee, contractor.

Twenty-third St., bet. Columbia Ave. and Berks

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THE HORTICULTURAL HALL FOR THE NEW ORLEANS WORLD'S FAIR.

THE building committee from the Board of Management of the World's Industrial and Cotton Centennial Exposition, has selected the design for the Horticultural Hall submitted by Mr. Arthur E. Rendle, of New York. Under the provisions of the ordinance passed by the City Council, granting the use of the Upper City Park to the Exposition, this building is to be a permanent structure; so the committee, in making a selection from the plans submitted, had to satisfy an element—that of durability—not considered in the designs for the main building. The plan chosen seems to embrace all the necessary conditions—adaptability, beauty and durability.

Mr. Rendle has entered into a contract with the Board of Management for the construction of the hall, and will use his patent system of glazing without putty, a system that has met with the greatest favor in England, where Mr. Rendle's brothers are owners of the patent. As an evidence of the success which they have met in Great Britain, it can be stated that they glazed three hundred and twenty-two thousand superficial feet in the Carlisle Citadel Station, one hundred and thirty thousand in the Glasgow Gordon Street Station, one hundred and sixteen thousand in Whitworth's Gun Factory, near Manchester, one hundred thousand in Dundee Station, and erected and glazed green-houses for the Prince of Wales, his Royal Highness Maharajah Dhuleep Singh, Prince Christian, the Dukes of Portland, Rutland, Sutherland, Devonshire, Beaufort, and a host of others. In fact, they have built over six hundred conservatories, large and small, in England, and have used up seven million square feet of glass. Mr. Arthur Rendle started the system in New York, about three years ago, and has also been successful there, having done the skylights for the new State Capitol at Albany, which is the handsomest in the country, and from whose commissioner he has received a most eulogistic endorsement. He also has a contract with the Canadian Government for a new depot at St. Johns, N. B., which is to be five hundred feet long.

The distinctive feature of this system is that instead of being fastened on wooden frames by means of putty the glass is placed in horizontal metal grooves and fixed on wooden or iron purlins. The wood-work and iron-work are so entirely covered by the metal and the glass that only a narrow strip of zinc is seen, and the whole looks like one great square of glass, and as the metal framework is a great deal thinner than the wood-work ordinarily used, fewer rays of light are obstructed in

their passage. In fact, the patentees claim that their system gives thirty-three per cent more light than any other.

The Horticultural Hall of the Exposition is to be situated about six hundred feet directly south from the main building, and almost between that building and the levee. The centre of the central hall will be just over the large reservoir or cistern, that has been in the Park for a number of years, and will be on the highest ground in the enclosure. In addition to being on an eminence, it is finely situated in regard to the avenues and clumps of trees in the immediate vicinity, as one long avenue leads up to the central hall. Standing at the entrance to this avenue the vista ended by this hall will be highly picturesque.

The entire building will be six hundred feet long and one hundred wide, except at the Central Hall, which is made by a widening out of the building to one hundred and ninety-four feet for a length of one hundred feet. Rising above this central hall is a tower which will be nearly ninety feet high, and which, built of glass, will be the crowning glory of the structure. On each side the construction is as follows: There is a wall of eleven feet, almost full of windows and ventilators; then there is a glass roof, which rises in a long slant, sixteen feet; then a perpendicular line of ventilators six feet high, and a second glass roof slanting at the same angle as the first to a height of fourteen feet. The top of this roof forms the apex to the entire building, except at the centre, where the tower rises about forty feet higher. This construction will, therefore, present to the eye a vast expanse of shining glass, which, glistening in the sunlight, will produce a gorgeous effect. Indeed, in appearance the hall will not be unlike the famous Crystal Palace at Sydenham, England, though, of course, it will not be so large. It will, however, be the largest horticultural building on this continent, and with the extensive exhibit already in preparation for it, will make one of the most attractive structures in America.

The Central Hall is to be devoted to a display of rare plants and flowers, and here will vie with one another in iridescent competition, the flora of Florida, Mexico, Central American countries and Louisiana. Besides this Central Hall, one section of the building occupying a space two hundred and fifty feet long by twenty-five feet wide will be used as a tropical hot-house, in which the most delicate flowers of the far South can blossom in their brilliant perfection. The space near the outer walls to a width of twenty-five feet around the entire building will be devoted to plants and flowers,

while the central space will be used for the fruit display (except in the Central Hall as above described, and will contain room for twenty thousand plates of fruits). Thus there will be no partitions across the building, and the eye can traverse its entire length without interruption.

There are four chief entrances to the building, two large ones at the sides of the Central Hall, and two at the ends of the structure. Those at the side are twenty-five feet in width, and are made up of double doors and ornamented wood-work, crowned with a Gothic portico. The ventilators and windows will be on the Weatherel's simultaneous opening-gear process, by which fifty feet of ventilators can be opened together by simply turning a wheel. All of the heating and water apparatus will be on the most modern and scientific plans: everything will be adapted to the proper preservation and display of the plants.

Mr. Rendle's contract with the Board of Management calls for the completion of the building by the fifteenth of September, so he will begin work about the first of March, and push the construction vigorously. In case the city finds, after the Exposition is over, that the building is too large, the building is so constructed that both its wings can be taken down and the central hall left standing, it of course being necessary to close up the gaps thus made. As all the perishable materials to be used in the work will be completely covered by the glass, the system of glazing may fairly be described as indestructible.

A. E. RENDLE,

10 HORATIO STREET, NEW YORK, N. Y.

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FOR work requiring large quantities of Portland cement, and to all points where shipments can be made without breaking bulk we are now prepared to furnish Saylor's Portland cement in *bulk* or in *bags* in full car-load lots and larger quantities.

In England and on the Continent it has been the custom for years for contractors to buy their Portland cement in *bags*, saving them the cost of the barrel. We have already supplied to Messrs. Carnegie Bros. & Co., of Pittsburgh, Pa., 3,540 tons of Saylor's Portland cement in bags, which is equivalent to 16,000 barrels, and have supplied large quantities to the Central City Pipe Works, Syracuse, N. Y., in *bulk*, and we are now under contract with the Hoopes Artificial Stone, Cement and Paint Co., Baltimore, Md., for 1,900 tons in bags (for work on the Baltimore & Ohio R. R.), which is equivalent to 10,000

barrels. The average cost of a Portland cement barrel is 35 cents, which can be saved by using bags, or where possible by ordering in bulk. Cement-pipe manufacturers using large quantities of cement will do well to note these facts.

By this means it is possible for architects and engineers to use Saylor's Portland instead of the light-burnt cements; be assured of better work, and at less cost to their clients. We solicit correspondence on this subject. Address

JOHNSON & WILSON, General Selling Agents for
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IRON FENCING.

THE Champion Iron Fence Company of Kenton, Ohio, which in 1883 occupied the largest floor-space of any similar institution, has again branched out, and are now erecting a brick structure, covering about one-third of an entire square. Their business increased so rapidly last year, that they found it impossible to fill all their orders, and they are making every effort to be able to meet and take care of the immense business which is already beginning to pour in on them.

A short walk through their works shows how much time and space can be utilized by improved machinery, thoroughly trained workmen and a systematized unity throughout the whole management.

In their special lines, such as iron fencing, railing, cresting, weather-vanes, tower-finials, entrance-gates, cellar-guards, brackets, iron stairways, settees and chairs, veranda columns, pedestals, etc., they are the largest manufacturers in the United States.

Their designs are so new, beautiful and attractive that they are being called for by "exporters," and we have every reason to believe that in a short time their foreign trade alone will test their capacity. Their reputation as manufacturers of the Champion Iron Force-Pumps is growing steadily, and wherever introduced they have given perfect satisfaction.

CHAMPION IRON FENCE CO.
190 & 192 WEST FRANKLIN STREET, KENTON, O.

WINDOW SCREENS.

In placing this invention before the public, we wish to state that our screen is no longer an experiment, as it has proved during four years of practical trial to be all that we have claimed.

Our screen will work to perfection at all times, as it can be moved up or down with ease during wet weather as well as dry. We therefore warrant it to last longer, and work better, than any other screen on the market. It never warps, as the steel frame holds it firm.

The whole construction of our screen is

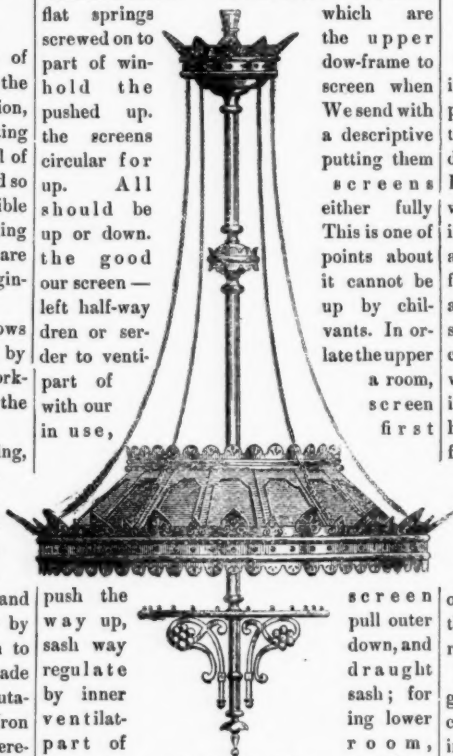


simplicity itself; there are no small screws, pins, or spiral springs, to rust and get out of order. The steel frame is nine-sixteenths inch

wide by one-eighth inch thick (for common windows, and proportionately wider and thicker for larger ones), of tempered steel, which is screwed on to a wooden frame three-eighths inch wide by three-eighths inch thick, to which the netting is attached with small tacks, the whole making a neat, strong, light, rigid mosquito-guard for windows.

The steel frame projects over the two side-edges of wooden frame sufficiently to fit into grooved strips of wood that are nailed to the inside edge of the outside window-casing.

The wooden strips are intended to go full height of window, and are furnished by us with each screen. We also furnish two small flat springs screwed on to part of window hold the screens circular for up. All should be up or down. This is one of the good points about our screen — it cannot be up by children or servants. In or late the upper a room, screen first



The Frink Reflector.

push the way up, sash way regulate by inner ventilat-part of have out-and screen down, then regulate draught with inner sash as before.

Remember, our screens are intended to go outside of window-sashes, next to the outside blinds, and, being very thin do not interfere. Blinds can be shut, and screens can be raised or lowered. This is an impossibility with the old wooden screens, as they have to be made thick for strength, and therefore interfere with the working of outside blinds, making their use impossible on hot days.

This screen frame, being made of tempered steel, is flexible to a certain extent, an idea the inventor worked on for years before bringing it before the public. This enabled him to do away with spiral springs on the sides (as are found now on all wooden frame screens) which were always getting weak and out of order. Our method of putting screens into windows is as follows: After the grooved strips are nailed to the edge of casings, place the projecting edge of one side of screen into the groove of one strip, and bend the screen outward till the other edge will slip into the other groove: then let go and screen will straighten out and fit snug to window; it can then be raised and lowered as desired.

We make all kinds of arched and curved screens.

Steel frames are all properly japanned and painted, as a perfect protection against rust.

Nettings are all properly painted two coats before using. We intend to do none but first-class work, at a fair price.

We give eighteen square inches more air-

space in ordinary windows than is found in any other screen.

This screen can be put up by any carpenter, as we furnish directions for that purpose. Send for directions for taking measures yourself.

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BROOKLINE, MASS.

FRINK'S REFLECTORS.

It has long been an object with those having the care of churches and public halls to provide some way of lighting that at the same time should be a means of ventilation. This difficulty seems to be effectually solved by Mr. I. P. Frink's celebrated crystal-glass reflectors, which are now so extensively used in buildings of this character, and which certainly afford the best means of illumination now before the public. The forms of this reflector are so familiar that it is not necessary to describe them, as there is hardly a hall or a church in the country of any pretensions where they may not be found, and we presume it is safe to say there is not one where they have not fulfilled perfectly all that is claimed for them. The heat of the lamps or gas draws up the foul air, which passes through an opening in the reflector into the roof, thus keeping the atmosphere free from noxious odors and substances, whilst the reflection obtained from it is superior to that of any other form of burner in use. It is stated by those who use it that the economy of the arrangement is remarkable.

Mr. Frink's system of lighting is constantly growing in popular favor, having been recently adopted in the "Grand Central Depot," in New York, where twelve seven-foot 52-burner reflectors replace the electric lamps that had been used. Among prominent churches using them, Plymouth Church, Clinton Avenue Congregational Church, Lafayette Avenue Presbyterian Church, Brooklyn; Trinity M. E. Church, New York; Dr. Meredith's new church, Boston. Public buildings: Tremont Temple, Boston, Mass.; new public High-School building, Hartford, Conn.; new Music Hall, Buffalo, N. Y. He is now lighting a large church in Lagos, West Africa; after experimenting with all kinds of light. Frink's reflectors were selected by W. & J. Sloane for lighting their new store, Broadway, corner Nineteenth Street, New York.

Special designs furnished architects to correspond with any style of architecture by addressing,

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WATER METERS.

THE attention of water works departments and water companies is called to the accompanying circular of the Worthington Meter.

The reputation of this machine for durability, accuracy and general excellence has been so well established and so universally conceded that during many years little or no change in the details of its construction has appeared necessary. The continued increasing demand for it, however, has justified recent enlargements in manufacturing facilities, and such modifications have at this time, been introduced, as will remove any defects, however trivial, that may have manifested

themselves during its diversified and extended service.

In view of these improved facilities, and the fact that the preference is occasionally given competitive machines on account of their greater cheapness, it has been decided to reduce the prices of Worthington Meters from this date, to a point lower than has ever heretofore been reached. Discounts will be quoted on application, and contracts based upon the delivery in a stated time of a specified number, can be made at special rates.

The services of Mr. S. A. Welch, who has long been identified with this department of hydraulic engineering, have lately been secured. He will hereafter represent the interests of the Worthington Meter.

HENRY R. WORTHINGTON,
86 and 88 LIBERTY ST., and 145 BROADWAY,
NEW YORK.

CREOSOTE STAIN.

The remarkable success of my Creosote Shingle Stains during the few years they have been in the market and the increasing demand for them during the present season, has induced others to manufacture something which they call "Creosote Stains" but which are only worthless imitations of the stains of which I am the original and only manufacturer. They are, however, in general appearance, well calculated to be mistaken for my stains, having in them enough coal-tar oil to give them a creosote smell, and being pretty good imitations of my colors. The samples which they send out are also exactly copied after mine—being the same in size and shape and marked with a steel stamp exactly as mine are—except that they have substituted "— & Co." in the place of my name. The samples which have been shown to me are, however, much inferior in appearance, the color is easily rubbed off on the hands and some of their greens are entirely destroyed by the application of strong soap-suds, soda or other alkali. Below I give an analysis of one of these so-called "stains" made by a well-known chemist of this city.

BOSTON, March 27, 1884.

SAMUEL CABOT, Jr., Esq.,

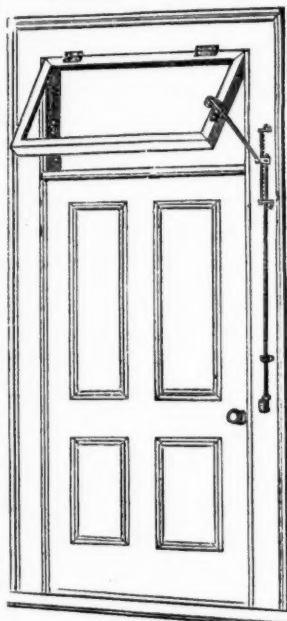
Dear Sir,—The sample of red "Creosote Stain" which you sent me, and which is marked "— & Co., No. 7," consists of an ordinary iron-paint mixed with a large proportion of crude coal-tar naphtha, of low gravity (12° Baumé).

The iron-paint is very coarsely ground, and is not a pure oxide of iron, but contains alumina, manga-

nese and silica. It is mixed with linseed oil, but whether regularly ground in oil, as a good paint should be, or simply mixed, it is impossible to determine in the presence of so large a quantity of naphtha.

The crude coal-tar naphtha used contains hydrocarbons with very low boiling-points, some even distilling at or below 100° centigrade, and about half the quantity distilling below 150° centigrade. Such a tar-oil would be very dangerous to use, from its liability to give off inflammable vapors at low temperatures, and beside this, being a dark, crude oil, it is impossible to obtain brilliant colors with it, as a full line of samples of the same make would probably show.

There is no fixative used in making this stain, which fact, together with the coarse nature of the color, causes it to adhere but slightly to the surface of wood, and not to penetrate the grain, so that in actual use it would, in a short time, be destroyed by exposure to the weather. In fact, the whole



New Transom-Lifter.

composition of the stain is such as to render it decidedly an inferior article.

Yours very truly,

AMORY AUSTIN.

I need not warn architects against such a composition as the above; and will merely mention that my trade mark will be found on all packages of my stain.

SAMUEL CABOT, Jr.,
71 KILBY STREET, Boston, Mass.

A NEW TRANSOM-LIFTER.

An improved transom-lifter which is designed to obviate the difficulties met with in the ordinary article, is shown in the accompa-

nying engraving. A, represents the stationary locking-bar, which is fastened by two brackets to the door-casing, and which receives the spur of the locking-bar B, thus holding the transom in any desired position. In opening and closing the transom the block B is moved up and down by the operating rod C, near the end of which is a spur which fits into the notches of the locking bar, where it is held by a spiral spring connecting the block B and the operating rod C, until by turning C the spur is freed from its hold and the block permitted to run up and down the bar. In brief, by turning the operating rod the spur is disengaged from the locking bar, and then by moving it up or down the position of the transom may be changed, and when the desired position is reached the spring carries the spur back and holds it in its place. By changing the position of the locking bar and modifying the length of the arm E, this lifter can be adapted to transoms hinged at the bottom, top, or on pivots.

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Estimates, and all information regarding the sale of our elevators, will be cheerfully given on application to our Eastern office.

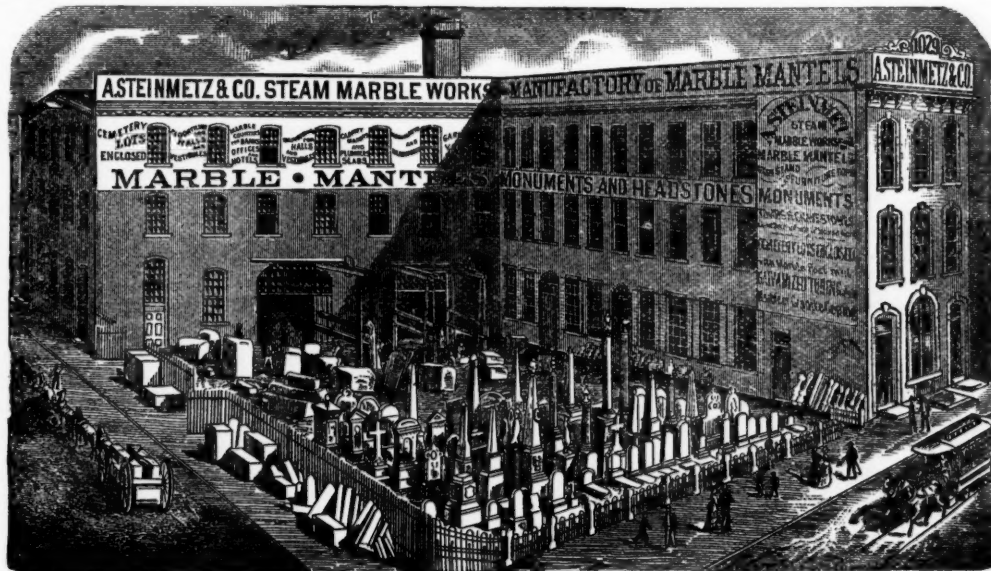
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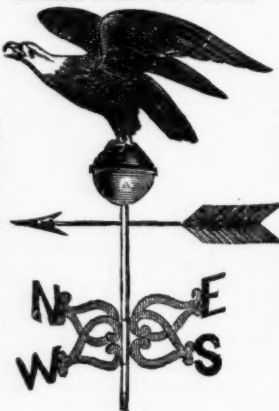
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