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CONTENTS.

A QUESTION of responsibility is answered in the last number of *La Semaine des Constructeurs*, which has a general interest. It seems that a certain proprietor employed an architect to design and supervise the construction of a country house, and after the completion of the house requested him to see to the provision of a supply of water for the buildings. The architect searched the ground in the neighborhood for springs, and found several, the streams from which he collected into a single channel, building finally a dam across the channel, with a flume, which gave sufficient power to operate an hydraulic ram; and by means of this water enough was forced up to supply the buildings above. The plan of the work was completely successful; the hydraulic ram was purchased and put in place, and continued for some time to furnish water; but before long leaks appeared in the dam, the water filtered through the joints, and forced its way under the footings, and around the ends, so that, the head being lost, the ram at last ceased to pump. Under these circumstances the owner, or rather, one of his friends for him, applied to *La Semaine* to learn whether the architect could not be obliged to repair the dam and make it water-tight at his own expense. It is hardly necessary to say that the question is answered decidedly in the negative. The fact that the flume and ram worked successfully for a time is, as the editor of *La Semaine* says, sufficient proof that the plan of supply, which the architect was employed to devise, was a good one, and the subsequent failure, which was acknowledged to be due to the bad workmanship of the dam, must be charged to the contractor, who furnished the bad workmanship and the inferior mortar, and pocketed the pay for them.

AT the same time, the account of this case affords a lesson to which the attention of architects cannot be too earnestly directed. We all know that many of the people who employ architects regard them as being the sureties, or bondsmen, of all the contractors, endeavoring to load upon them the responsibility for every fault by which the carpenter, mason, plumber or painter may have profited, and sometimes even exacting from the professional men, who are likely to be poor, and afraid to claim their rights, the indemnity which they do not venture to demand of the contractors; but there are cases in which, although the architect may have acted in perfect good faith, and with the most anxious solicitude for his employer's good, he would nevertheless be legally bound to pay, perhaps a ruinous sum, to make good damage resulting from his own excessive zeal for another's interest. In the case quoted, for example, if the failure of the dam, by which the water was retained for operating the hydraulic ram, had been due to the scouring action of the current upon the sand beneath or at the sides of the wall, it may be seriously questioned whether the architect could not be compelled to pay for rebuilding it, on the ground that his technical knowledge ought to have warned him against the danger of scouring under the circumstances. It might happen in such an instance that the extending of the wall down to solid hard-pan or rock, which is the only real safeguard against the scouring out of sandy gound beneath it, would be extremely costly, and the architect, knowing that proprietor to be unwilling, or unable, to expend the money necessary for this, would be very likely to do what he knows that nine proprietors out of ten would wish, and adopt the cheaper mode of building, forgetting that by doing so except under explicit protest he makes himself liable, if fortune should not favor his well-intended efforts, to pay out of his own pocket for reconstructing the whole affair in the manner which he had approved in the first place, but regarded as too costly. It should never be forgotten that the law requires from an expert, above everything else, skill in the art which he professes; and that it will view with little sympathy his excuses for failing to act under all circumstances according to his best technical knowledge. If his client refuses to take his advice, or, on two alternative constructions being explained to him, elects to adopt the cheaper and more hazardous one, the architect's personal responsibility for the consequences is at an end; but, as several decisions show, the professional man, to transfer the responsibility for the results of a given course upon his employer, must represent to him in the fullest and clearest manner the dangers or inconveniences which would follow from adopting it. Although a case just like this is rare, there are many occasions in the daily life of architects for applying this principle. Nothing is more common than for a client to remark that he has "ordered such and such piers taken out from the cellar, as they were in the way;" or that he "has decided to build the party-wall between his house and the next eight inches thick, as the mason says that is ample," or more commonly, that he "must cut down the cost at least one-third, leaving the sizes and arrangements of rooms untouched," and so on. In reply to such information it is not enough for the architect to acquiesce; he must point out the objections to the changes proposed, remembering also to give a general warning against further disadvantages which may not occur to him at the moment, but for which he must disclaim any responsibility. There is no reason why a client should be offended at a frank explanation of the difference between a good and a bad, or doubtful, mode of doing work. If he is a sensible man he will be pleased to find himself dealing with one who understands his business, and will not allow him to fall ignorantly into costly blunders; and if he is one of the foolish kind, who resent the idea of any one's pretending to know more about a given subject than themselves, he will be all the more likely to volunteer to assume all the consequences of his whims.

A RATHER promising field for the investigations of practical chemists is pointed out in an item which seems to be going the rounds of the newspapers; and which mentions the fact that a Mr. Fergusson is now exhibiting in London a process for producing electricity by the action of chemicals which, after combining, and developing the amount of electric energy incidental to the reaction, are worth more than they were before they were put together. This reads like a valuable discovery, since the great cost of voltaic electricity, as now used, is almost entirely due to the depreciation in value of the chemicals used to react upon each other for producing the current; but there are many ways of developing electric force by combinations which result in the production of compounds more valuable than the separate components. For instance, it would undoubtedly be possible to obtain currents from the reaction of acetic acid upon lead, and as acetic acid is a very cheap product, and lead is not costly, there would probably be some profit in the sale of the sugar of lead which is formed from the combination of the two substances, and which is used in medicine, and in various industrial processes. On a smaller scale, the action of aqua-regia upon gold would give at once an electric current and a product more valuable than either reagent; and there must be many similar instances. The main difficulty in applying such processes to practical use would probably lie in the limitation of the market for the products. Nitrate of ammonia, for example, which is a rather costly compound of two cheap substances, is used almost exclusively for the preparation of laughing-gas, and as people cannot stupefy themselves, or have their teeth drawn, simply to accommodate the telegraph or electric light companies, the general use of nitric-acid and ammonia in batteries would result in depreciating the price of nitrate of ammonia until it could no longer be sold except at a loss. In isolated instances, however, as in large manufactories of chemicals, such reactions might, perhaps, be very profitably employed; and the person who can show the

most successful application of this idea, let us say at the Philadelphia Electrical Exhibition, next September, is likely to secure a substantial recompense for his trouble.

THE *Builder* gives a short account of the recent earthquake which was felt almost all over England, and it would appear that the shock must have been a serious one. We are so accustomed to hearing stories of California earthquakes that we are inclined to laugh at the experiences of countries having a soil naturally more peaceable, but the English earthquake seems to have far surpassed in intensity any yet experienced in San Francisco. In Peldon, a small town in the county of Essex, not a single building of any kind escaped injury, and over the whole surrounding region roofs were twisted off, chimneys and gable walls thrown down, and long fissures opened in the ground. At Colchester about forty feet of the stone spire of a new church fell to the ground, and the tower of a heavy Norman church not far off was thrown down, crashing through the roof, and nearly filling the building with stones and mortar. The rectory attached to the same church, standing about two hundred yards away, was almost demolished, the walls being cracked in every direction, and the chimneys thrown over. In London, although no serious harm was done, the shock was felt in the higher buildings, and the Victoria Tower of the new Parliament House swayed, according to the observation of the superintendent of the building, about four inches from the vertical.

AS might be expected, so unusual an occurrence as an earthquake has called out much comment, and brought to light some interesting facts. It was at first reported that, owing to the general stability of British soil, no seismometer, or instrument for detecting and measuring vibrations of the earth, was in condition for use in England; but subsequent information showed that a certain small district in Scotland, although never violently shaken, is almost constantly in a tremulous condition, and a seismometer, which is placed in the tower of the parish church, registers innumerable faint shocks. The ancient records of the kingdom show that up to the present time two hundred and sixty-one English earthquakes have been recorded, and many slight ones have undoubtedly passed unnoticed. During the reign of Queen Elizabeth shocks were particularly frequent, so that a special form of "earthquake prayer" was composed and issued by the royal command. The most curious piece of information relating to earthquakes, however, seems to have come from the company which manufactures and sells the Balmain luminous paint. The books of the company show that large shipments of this paint are made to the countries where earthquakes are most common, such as the Philippine Islands; and it seems that the inhabitants make use of it for painting small metallic plates, or patches on the walls, which they dispose in such a way as to serve as guides to the door-handles and the stairs, in case the family should be obliged to run for the street in the middle of the night. Besides the advantage of being always ready, the luminous-paint guides have the good quality of being harmless in case the building should fall, while lamps, under such circumstances, are almost sure to set the timbers on fire, and in that way roast the persons who may happen to have been imprisoned in the debris.

AN interesting account is given in the *Schweitzerische Bauzeitung* of an electric railway, designed to facilitate the transportation of passengers to and from a certain hotel near Montreux, on the Lake of Geneva. The hotel is on the side of a mountain, and commands a splendid view over the lake, but the carriage road by which it is reached is steep and long, and the conveyance of supplies for the hotel, as well as passengers, is costly. The construction and maintenance of a steam-railway, like that on the Rigi, or rather, like that on our Mount Washington, from which the Rigi railway was copied, would be beyond the resources of a single hotel proprietor; and the cheaper plan, much used among our coal mines, of drawing the cars up the inclined track by means of a stationary engine and an endless rope, could not be carried out in this particular place, on account of the crookedness of the road, which, especially near the summit, nothing but very costly engineering works could rectify. Under these circumstances the proprietor applied for assistance to an expert who happened to be his guest for a day, and was advised, after consideration of the circumstances, to try an electric railway. The mountain torrents in the neighborhood afforded ample power for operating the railway without cost, if their force could be transmitted to the place where it was required, and for this transmission an electrical apparatus offered available means; while, independent of the economy in operation, the machinery of an electric railway would be less expensive than that of one depending on steam.

NOT wishing to act too hastily, the friend decided to experiment with the electric apparatus on a small scale before undertaking the construction of the road; and an experimental railway was set up in the hotel grounds. The track was only about a hundred and seventy-five feet long, but it was so laid as to present all the engineering difficulties of the boldest railway, the inclination to the horizon varying from thirty to thirty-six in one hundred, while the upper part terminated in two curves, in opposite directions, tangent to each other, each having a radius of sixty-five feet. A ratchet rail was fixed in the middle of the track, and a car, consisting of a platform on four wheels, was built to carry the electric motor. It was at first intended to utilize for the experiment the electric current which was already derived, by means of a turbine wheel, from a neighboring stream, and used for lighting the hotel; but, although this current was tried two or three times, with perfect success, the difficulty of determining with exactness the percentage of force transmitted through a wire which branched in every direction to supply the lamps decided the experimenters to use for the occasion a small steam-engine, with a dynamo machine and conductors entirely separate from those used for the lights. With the help of these the little car was easily driven up the steep grades and around the curves at a speed of three or four hundred feet a minute, with a load of two, three, and even four passengers, although this was considerably beyond the calculated power of the motor. The current was conveyed from the generator to the car by means of a copper wire laid beside the track; and a device by which substances of different resistance were successively interposed in the current served to make the starting and stopping of the car easy and gradual. Two brakes were employed, one mechanical, operating upon the gearing of the motor, and the other electrical, depending upon the interposition of resistances to moderate the speed, either in ascending or descending, at pleasure. Both brakes seem to have worked well, the mechanical one almost instantly arresting the car on the breaking of the electric current; while the other, used alone, easily kept the speed of the car in descending at any desired point, from a rate of twenty feet a minute to three hundred. The success of the experiment decided the proprietor of the hotel to proceed at once with the construction of the working railway, and the grading is now in progress. The length of the completed road will be about two-thirds of a mile, with grades varying from ten to thirty in one hundred, and the car, carrying six or eight persons, will pass over it in seven or eight minutes. If the business of the hotel should require it, a second car can be put on the road, running in the opposite direction, with a turn-out at the middle of the line, and using the same electric current. The force available for operating the cars, furnished by streams within the boundaries of the hotel estate, is estimated at twenty-five horse power, which is much more than will be needed.

THE history of the great suspension bridge between New York and Brooklyn now covers the space of one year, the bridge having been opened for travel on the twenty-fifth of May, 1883. Considering the enormous cost of the bridge, the statement of the receipts from travel over it is unexpectedly encouraging, nearly three hundred and ninety-two thousand dollars having been received in tolls. Of this the cable-railway cars have contributed about two-thirds, the remainder being pretty equally divided between foot-passengers and ordinary vehicles. Five hundred and eighty-seven thousand of the latter have passed over the bridge, carrying probably at least a million passengers, and the cars have transported something over five millions more, while more than six millions have crossed on foot, making a total of something over twelve millions of persons, or about thirty-three thousand a day. It was some months after the opening before the bridge came much into use as a regular thoroughfare, and the cable railway is only just put into running order, so that it is altogether likely that the next year's traffic will be much larger than that of the past twelve months; and allowing for the natural growth of the two cities it is not impossible that the tolls may yet pay a fair interest on the cost of the great undertaking.

THE SIPHONAGE AND EVAPORATION OF TRAPS.

Report to the Boston City Board of Health.

TO THE BOSTON CITY BOARD OF HEALTH:—

Gentlemen,—The experiments heretofore made in this country on the siphonage of traps have faithfully shown the siphoning power of those fixtures which are in most common use; and have established the relative strengths of the various forms of best known traps in resisting such power.

You have seen that these experiments have been made and recorded with a degree of care which renders it superfluous to experiment further in the same field. But the fixtures in common use are not the ones which produce the most powerful action of siphonage, and as they are not the only ones used, it is evidently necessary, in order to present a full and correct view of the subject, to supplement the former experiments with others made in a new direction.

The tests have hitherto been made with common pan and hopper closets. It remains to investigate the action of plunger-closets, and these will serve to illustrate also the maximum power of valve-closets, which we assume to occupy a position, in respect to siphonage, intermediate between plunger and ordinary hopper closets.

In the former experiments a single round or pot trap was tested; but inasmuch as these traps are made of various sizes, from that which has a body but little larger than that of an ordinary 1½″ S-trap, up to the largest whose body measures 8 or 10 inches in diameter, and as their power of resistance to siphonic action is totally dependent on their size, the smallest being but slightly more resistant than an S-trap of equal depth of seal, and the largest being practically unsiphonable, you have recognized the necessity, in order to arrive at correct conclusions as to the efficiency of this trap, of testing them all, and publishing the results in regular tabular form.

The third subject which your Board has given us for investigation is one upon which nothing has to our knowledge as yet been published; but which has, in view of the recent plumbing regulations enacted in different parts of this country, assumed a vast importance. The special ventilation of traps in the manner now customary, induces a current of air over the water-seal, which lowers its level more or less rapidly according to the velocity, temperature, and hygrometric condition of the air current.

It is sometimes recommended by sanitary engineers and plumbers to connect the vent-pipe with a heated flue, in order to ensure an upward current. Accordingly we have made our tests on trap-ventilation both with heated and with cold flues, and in order to give them as wide an application as possible, we have tested the traps in various positions, and applied the vent-pipes to various parts of the trap.

Finally, we have studied the effect of *back pressure* on traps, and in this direction as well as in the others, we have endeavored to apply tests as severe as could ever possibly be encountered in practice.

The apparatus used for making our tests is illustrated in the accompanying drawings.

Figure 1 represents a straight stack of 4″ soil-pipe, such as is used in ordinary house-plumbing. The stack is built exactly perpendicular, and without bends from the outlet above the roof to the horizontal run under the basement floor, a distance of 70′ 9″. The soil-pipe was run up straight in this manner in order to furnish the conditions for the severest possible tests for siphonage and back-pressure. At the same time it forms the arrangement most commonly met with in practice, and the one most to be recommended. The unbroken fall of the water through such a pipe evidently creates the most powerful compression of the air in advance of it, and the greatest rarification behind it.

Just below the fourth floor is placed a large cistern, 44″ long, 16″ wide, 15″ up to overflow, inside measure; or of 46 gallons capacity. The cistern served also to illustrate the action of a bath-tub, by having a 1½″ discharge-pipe at its bottom trapped with a Bower's large size trap, and entering the soil-pipe just above the entrance of the water-closet waste.

The water-closet used was one of Zane's plunger water-closets, a kind well known, and widely used in this country. To expedite its filling a large service-pipe from the cistern was used, and the water was allowed to fill the closet through a brass compression-cock. The water-closet is supplied with a regular overflow-pipe, so that, when full, its capacity is always the same. This capacity is a little over 4½ gallons in the closet used in these experiments.

To test the effect on traps below of emptying the tank after the manner of a flush-tank, a 4-inch outlet-valve and waste-pipe were fitted up in the manner shown.

Outlets were left on each story below the water-closet for testing the traps at various heights on the stack. The soil-pipe was ventilated at the top full-size, and had the usual foot-vent. This completes the apparatus for the experiments on siphonage and back-pressure.

For the experiments on evaporation a 4″ galvanized-iron flue was erected by the side of the soil-pipe. This flue terminated just below the first floor in a galvanized-iron lantern, with a glass door on its front side. A 1½″ rubber tube was connected with the bottom of the lantern, and an anemometer was placed above the point of connection in an enlargement made to receive it. The anemometer was so arranged and placed that it would measure accurately the current of air passing through the rubber tube in either direction. The galvanized-iron flue could be tested either cold, or heated by gas-jets as shown in the drawing. A second lantern was placed on the third floor, with a similar appliance for heating the flue.

A 1½″ lead waste-pipe was connected with the soil-pipe just above the basement floor. This branch waste had a number of ventilating openings made upon it, and a deep-seal S-trap at its end. The trap had three ventilating openings in its outlet arm, one at the crown, and the others below the crown, as shown. All the vent openings both on the trap and on the branch waste were provided with small connecting tubes so arranged that the rubber ventilating flue could be readily attached to either. The openings were, furthermore, all provided with closely fitting corks, so that they could be hermetically sealed. By this arrangement the effect of ventilation at different points of the trap or its waste-pipe upon its water-seal could be accurately tested. Further tests on evaporation were made by connecting a second branch waste below the first with a brick flue heated by a stove.

Figs. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, show various traps tested in these experiments. Other traps were tested at the same time with these at the request of the manufacturers. Still others were sent us on the invitation of your Board; but as none of these traps except those shown, were able to preserve their seal against the tests applied, and as most of them have already been tested in the experiments for the National Board of Health, and the tests published, by which their power of resistance as relates to that of a ventilated S and to a pot-trap was made known, it has been thought unnecessary to publish the results obtained in these experiments. The records on any of these traps will, however, be cheerfully sent to its proprietor upon his request.

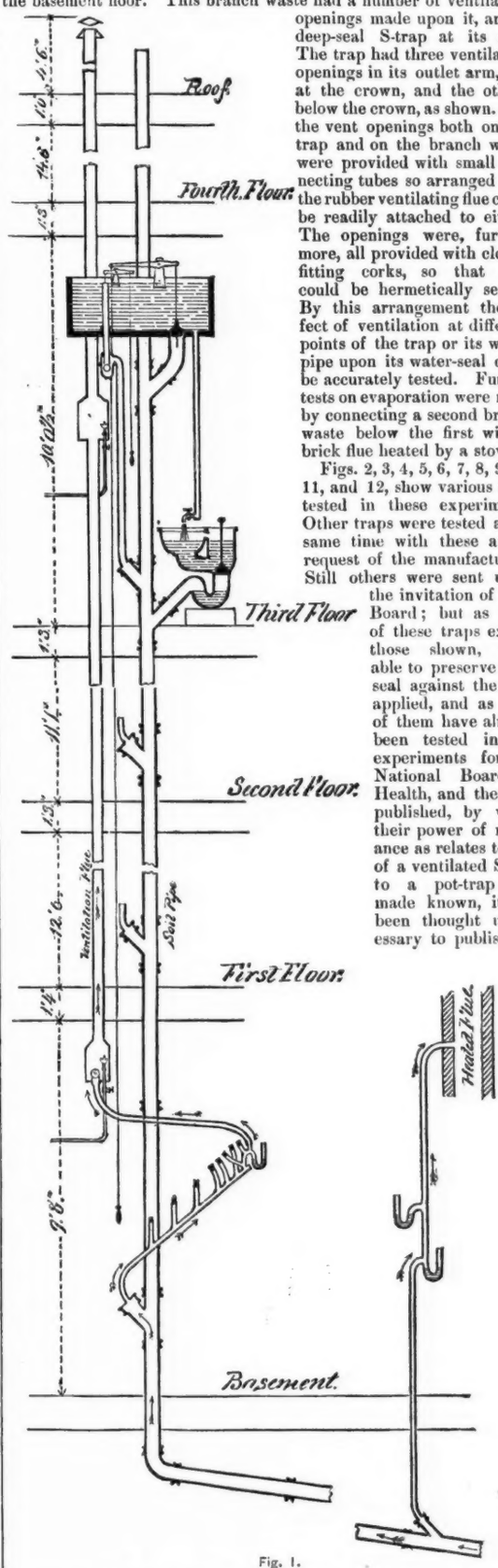


Fig. 1.

Our tests fall under three general divisions; (I) Siphonage; (II) Back-Pressure; (III) Evaporation.

I. EXPERIMENTS ON SIPHONAGE.

These experiments are subdivided into (*A*) those on ventilated S-traps; and (*B*) those on pot and other traps, unventilated. Except where otherwise specified, the tests were made at the outlet on the

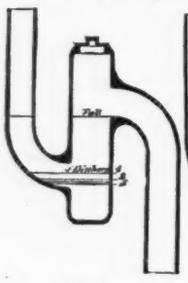
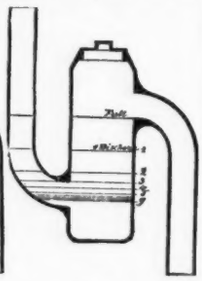


Fig. 2.

Fig. 3.



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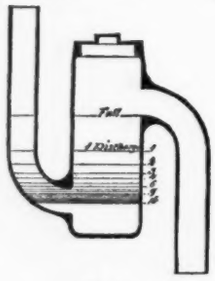

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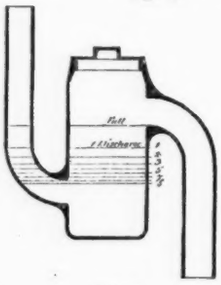


Fig. 6.

second floor, at a distance of about 11′ below the bottom of the water-closet trap, since at this point the siphonage proved to be most severe.

(*A*) EXPERIMENTS ON VENTILATED S-TRAPS.

These experiments are again divided into:—

(1) Those in which the siphonic action was produced by a trapped plunger-closet, with and without the combination of a bath-tub.

(2) Those in which a *trapless* plunger-closet was used.

(1) *Experiments on the Siphonage of Ventilated S-Traps by a Trapped Plunger Water-Closet.*

The tests were made first with the water-closet alone.

(*a*) An unventilated S-trap was, of course, completely siphoned out by a single discharge of the closet.

(*b*) A 1½″ ordinary cast-lead S-trap, having a 1½″ vent-hole at the crown, and a 1½″ pipe of smooth clean lead 17′ long attached at the opening was

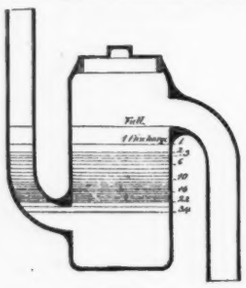
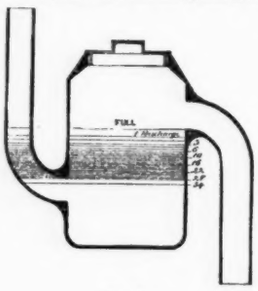


Fig. 7.



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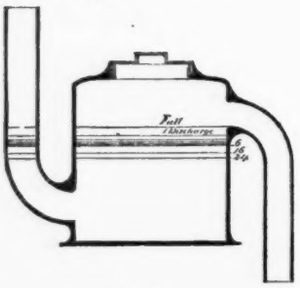

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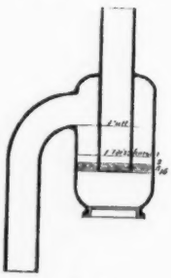


Fig. 10.

then tested. Three discharges of the closet were sufficient to break the seal. The experiment was repeated several times with the same result.

(*c*) A 1½″ cast-lead S-trap, constructed as shown in Figure 13, was tested. The vent opening at the crown was 1½″ in diameter; the others were 1½″ in diameter.

A 1½″ pipe 7′ long was attached to the vent opening at the crown, the others being closed. Five discharges of the closet sufficed to break the seal.

The pipe was increased to 17′. The seal was then broken by *four* discharges.

This opening was then closed, and the long pipe was attached to the middle vent. The first discharge of the closet lowered the seal 1½″. The second broke the seal.

The lower vent was then tested with the same pipe, 17′ long. Four discharges were required to break the seal.

(*d*) The effect of the discharge of the water-closet while the bath-tub was emptying was then observed.

An ordinary 1½″ S-trap was first tested. With a vent opening the full size with the bore of the trap, but without vent-pipe, a single discharge of

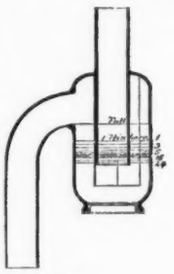


Fig. 11.

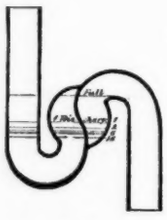


Fig. 12.

Fig. 13.

the water-closet and bath-tub together lowered the seal ⅛″. A second discharge failed to lower the water any further.

(*e*) A 1½″ vent-pipe 7′ long was then attached to the opening. The first discharge nearly broke the seal; the second not only broke it but left the water standing ⅛″ below the mouth of the inlet-pipe. Three other tests gave the same results.

(*f*) The vent-pipe was then lengthened to 17′. A single discharge broke the seal, and swept nearly all the water out of the trap. Three repetitions of the test produced the same results.

The vent-opening was then reduced to one inch, and no vent-pipe attached. Two discharges broke the seal.

(*g*) The 1½″ common cast-lead trap was then tested.

Tested with the 1½″ vent open at the crown, but without any vent-pipe attached to it, a single discharge lowered the seal ½″. A second discharge produced no further effect.

(*h*) With a 1½″ vent-pipe 7′ long attached to this opening seven discharges sufficed to break the seal.

(*i*) With the vent-pipe increased to 17′, two discharges not only broke the seal but nearly emptied the trap. Substantially the same result was obtained upon repeating the experiment twice.

(*j*) A 1½″ pipe 20′ long was attached to the vent opening. Two discharges broke the seal.

The vent-opening was then reduced to ¾″ +, and no vent-pipe attached. Two discharges broke the seal.

(*k*) The *middle vent* was then tested. With a vent-pipe 1½″ in diameter (inside measure in all cases being understood) and only 8″ long, the water-seal was lowered ½″ by two discharges. A third discharge did not increase this loss.

(*l*) With a 1½″ pipe 7′ long attached a single discharge broke the seal.

(*m*) A 1½″ pipe 20′ long was attached; a single discharge broke the seal.

(*n*) The *lower vent* was then tested. A 1½″ pipe 20′ long was attached. Two discharges broke the seal. A repetition of the experiments produced substantially the same result.

It must here be noted that the connections between the traps to be tested and the branches on the soil-pipe were made by means of 1½″ copper tubes soldered into a lead cap on 4″ Y-branches, as shown in Figure 13. The outlet arms of the several traps tested were slid over this 1½″ copper tube, and made tight with putty. The connection being only 1½″, when 1½″ traps were tested, the suction on their seal was evidently somewhat restricted by the contraction. Hence the records of the experiments on traps having 1½″ outlets may safely be accepted as well within the limits of actual power of the siphonage produced at this point on the 4″ Y-branches.

The above recorded tests were all made on the second floor at a distance of 11′ below the water-closet trap. Back-pressure was here hardly perceptible. Tested on the first floor the siphonic action was much weaker, but a slight back-pressure was observable. On the basement floor the siphonic action was quite feeble, but back-pressure was exceedingly strong.

Deductions from the Experiments with the Trapped Plunger-Closet.

From the experiments thus far recorded we learn that the siphonic action which may be produced by a trapped plunger-water-closet under certain simple conditions which are likely to be encountered in plumbing, is sufficient to unseal small S-traps, such as are ordinarily used for lavatories, though they be ventilated either at or below the crown in the manner prescribed by the plumbing regulations with vent-pipes of the full size of the trap, and that it makes no material difference as to siphonage whether the vent-pipe be applied immediately at the crown or at a considerable distance below it. This action takes place even when the pipes are clean and new. When partially closed or clogged with sediment the results would be even more serious.

(2) *Experiments on the Siphonage of Ventilated S-Traps by a Trapless Plunger Water-Closet.*

(*a*) The tests were made first with the water-closet alone. A 1½″ ordinary cast-lead S-trap having a vent-opening at the crown the full size of the trap (1½″) was tested without a vent-pipe. The first discharge of the closet reduced the seal ¼″; the second ½″; the third produced no further effect.

The same trap was then tested with 17′ of 1½″ pipe attached to the vent-opening. Four discharges of the closet destroyed the seal.

On another occasion the same trap with 7′ of 1½″ pipe attached to the vent-opening lost its seal in four discharges.

A 1½″ S-trap was then tested at the outlet on the first floor. With the water-closet alone, and a 1½″ vent-pipe 20′ long attached to a 1½″ opening in the crown of the trap three discharges removed ⅜″ of the seal.

The same with a 1½″ vent-pipe 7′ long lost its seal in ten discharges.

(*b*) The tests were next made with the water-closet and bath-tub discharging together.

A 1½″ S-trap with 20′ of 1½″ vent-pipe lost its seal in five discharges. With 17′ of 1½″ pipe a single discharge broke the seal; with 7′ of 1½″ pipe seven discharges sufficed, and on a second trial only three discharges.

Tests were then made on the floor below (first floor). The 1½″ S-trap with 1½″ vent at the crown and 17′ of 1½″ pipe lost its seal in three discharges. In a second and third trial the seal was destroyed in two discharges.

The same, with a 1½″ vent-pipe 20′ long, lost its seal in four discharges.

A 1½″ S-trap with 1½″ vent-opening at the crown, and a 1½″ vent-pipe 17′ long lost its seal in four discharges, and on a second trial in a single discharge.

Deduction from the Experiments with the Trapless Plunger-Closet.

From these tests we find that the effect of siphonage produced by the discharge of a trapless plunger-closet is not appreciably severer than that produced by one having a trap, provided the trap is constructed of smooth material, has a shallow seal, and is placed near the water in the bowl. The increase of friction is in this case so slight that the manner in which the water discharges into the soil-pipe is not materially modified.

(*B*) EXPERIMENTS ON POT AND OTHER TRAPS UNVENTILATED.

These experiments are divided into: —

(1) Those in which the siphonic action was produced by a trapped plunger-closet.

(2) Those in which a trapless plunger-closet was used.

(3) Those in which a flush-tank was used.

(1) *Experiments on the Siphonage of Unventilated Pot and other Traps by a Trapped Plunger Water-Closet.*

(*a*) The tests were first made with the water-closet and bath-tub discharging together. The pot-traps had 1½ "or 1½" inlet and outlet arms.

A 2″ *pot-trap* had its seal broken, and the water lowered ½″ below the top of the inlet mouth by a single discharge. Five discharges lowered the water nearly to the bottom of the mouth (see Fig. 2).

A 2½″ pot-trap lost its seal in two discharges (see Fig. 3).

A 3″ pot-trap lost its seal in four discharges (see Fig. 4).

A 3½″ pot-trap lost its seal in seven discharges (see Fig. 5).

A 4″ pot-trap lost its seal in seven discharges (see Fig. 6).

A 5″ pot-trap lost its seal in twenty-two discharges (see Fig. 7).

A 6″ pot-trap lost its seal in twenty-seven discharges (see Fig. 8).

An 8″ pot-trap lost 1½″ of its seal in twenty-four discharges (see Fig. 9).

A 4″ bottle-trap lost its seal in fifteen discharges (see Fig. 10).

A 4″ Holland's trap retained 1-16″ seal after forty discharges (see Fig. 11).

A "*Sanitas*" anti-siphon trap retained over ¾″ after fifty discharges (see Fig. 12).

The loss of water in the Holland's trap in the last ten discharges was exceedingly slow, showing this trap, which is similar in outward appearance

Fig. 14. Fig. 15. Fig. 16. Fig. 17. Fig. 18. Fig. 19.

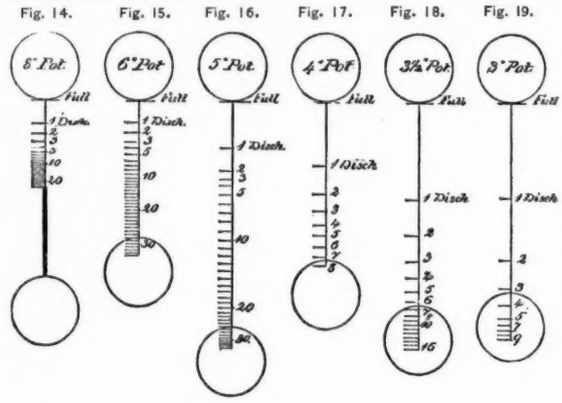
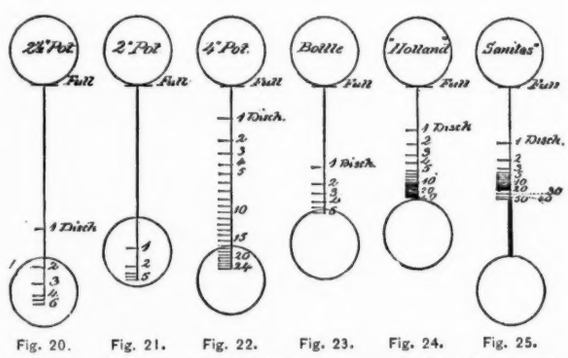


Fig. 20. Fig. 21. Fig. 22. Fig. 23. Fig. 24. Fig. 25.



to the 4″ bottle-trap, to offer much greater resistance to siphonic action than a bottle-trap of the same general dimensions.

The rate of loss in the "Sanitas" trap constantly diminished after the first few discharges. Several experiments were made on this as on the other traps. Figure 12 shows the effect of sixteen discharges. Figure 25 represents in diagram the record of another experiment on the same trap where the test was prolonged to fifty discharges. It will be observed that the loss towards the end was scarcely perceptible. In the first ten discharges in this experiment the seal was lowered 1½″. In the next ten the loss was only one-eighth of an inch, which is equivalent to one-eightieth of an inch for each discharge. In the third ten discharges it was still further reduced to one-sixteenth of an inch. In the fourth to less than one-sixteenth of an inch, and in the last ten to still less, or about one thirty-second of an inch. As there still remained over ¾″ seal the trap may be considered as practically unsiphonable.

Figures 14 to 24 inclusive represent in diagram the result of the experiments already described on "pot" and "bottle" traps.

The perpendicular lines represent the depth of seal of the traps.

The circles indicate conventionally the outlet and inlet mouths of the traps, and the horizontal lines the loss of water at each discharge.

(*b*) A 4″ *pot-trap* was then tested with the water-closet alone. Its sea was broken by sixteen discharges (see Fig. 22).

(*c*) A 3½″ *pot-trap* was then tested with the flush-tank. The first discharge almost and the second entirely broke the seal. Nevertheless, in other experiments made with the flush-tank the siphonic action proved less severe than that produced by the simultaneous discharge of the water-closet and bath-tub.

Deductions from the Experiments on Pot and other Traps.

From the above experiments we learn that the power of resistance of "pot-traps" depends upon their size, and more particularly upon the diameter of the body. It will be observed that the depth of seal of the 4″ pot-trap is only 2½″, while that of the 3½″ pot-trap is 3½″. This accounts for the similarity in the results of the tests on these two sizes. A half an inch excess of diameter of the body offsets, in the first series of tests, one inch excess in depth of seal.

It will be observed that, had the seal of all the traps tested been the same in depth, *i. e.*, 2½″, the resistance would have been in direct and regular proportion to the diameter. Thus, in the first series of tests :—

A 2″ pot would have lost its seal in less than one discharge.

A 2½″ pot would have lost its seal in one discharge.

A 3″ pot would have lost its seal in two discharges.

A 3½″ pot would have lost its seal in three discharges.

A 4″ pot would have lost its seal in seven discharges.

A 5″ pot would have lost its seal in ten discharges.

A 6″ pot would have lost its seal in twenty-eight discharges.

An 8″ pot would probably have resisted over one hundred discharges.

Hence (1) the resisting power of pot-traps of equal depth of seal is in direct proportion to the diameter of the body.

(2) No pot-trap whose body does not exceed in sectional area 15 times that of each of its arms or connecting pipes can be accepted as anti-siphonic under all conditions likely to be encountered in plumbing.

(3) Pot-traps having bodies 6″ in diameter and having 1½″ or 1½″ connections may, however, be considered safe when they are not exposed to the repeated action of plunger water-closets of the largest water capacity.

II. EXPERIMENTS ON BACK PRESSURE.

These experiments were made on the basement floor, just above the horizontal run of the soil-pipe. They may be subdivided into (*A*) those in which the traps were tested without vertical extension of the inlet arm; and (*B*) those in which the traps had their inlet arms extended. The water-closet used was a Zane's trapped plunger-closet.

(*A*) *Experiments on Traps without Vertical Extension.*

(*a*) An S-trap having the ordinary length of inlet-arm, *i. e.*, one whose top stood 6″ above top of seal was first tested under the discharge of the water-closet alone. The first discharge threw the water out of the trap, projecting it several feet in the air, and broke the seal. The experiment was often repeated with the same result.

(*b*) The same result attended the discharge of the water-closet, simultaneously with the bath-tub, only that the greater power of the action threw out more water from the trap, leaving the level considerably below the top of the month of the inlet-pipe. Several repetitions of the test produced the same result.

Fig. 26.

(*c*) The above experiments were repeated with a trapless plunger-closet. The results were substantially the same.

(*d*) A 4″ pot-trap lost its seal in four discharges of the water-closet alone. The top of the inlet-arm stood 2″ above the top of the seal.

(*e*) The same trap lost its seal in a single discharge of the water-closet and bath-tub together.

(*f*) The same traps were tested with a trapless plunger-closet, with substantially the same results. Figure 26 shows the manner in which the water is blown out of a large pot-trap by back-pressure.

(*g*) An 8″ pot-trap lost 2″ of its seal in seven discharges of the trapped-closet discharged alone. The top of the inlet-pipe stood 3″ above the top of the seal.

(*h*) The same trap lost its entire seal of 3½″ by the fourteen discharges of the water-closet and bath-tub together.

(*B*) *Experiments on Traps with Vertical Extension.*

(*a*) An ordinary 1½″ cast-lead S-trap with an extension of 1′ 4″ of 1½″ lead-pipe attached to the top of its inlet-arm, making the top of the extension 22″ above the top of the seal was tested. No water was thrown out of the trap by the discharge of the water-closet, either trapped or untrapped, and whether alone or together with the bath-tub; but in all cases air was forcibly driven through the water forced up into the inlet-pipe, because the volume of water in the trap was insufficient to outweigh the back-pressure.

(*b*) The same result attended the tests made with a 24″ extension-pipe.

(*c*) An S-trap having 5″ of seal without extension lost its seal in all cases; but with an extension of 1′ 4″ the water was not thrown out by discharges of the water-closet alone, or in combination with the bath-tub, and whether the closet was trapped or trapless. With this trap, moreover, the large volume of water was, with the extension sufficient to overbalance the pressure of the air, and no bubbles were driven through the trap.

(*d*) The same deep trap was then tested after half its seal had been removed, as by evaporation, or other accident. In this case the trap acted exactly as did the ordinary shallow-sealed, cast-lead S-trap before described, and always allowed air to be driven through it.

(*e*) A 4″ pot-trap was then tested with the 1′ 4″ extension, bringing the top of the pipe 18″ above the seal. No water was driven out of the trap, and no bubbles forced through the water under any of the four conditions under which the tests were made as described for the others.

(*f*) The same trap with a 6″ extension bringing the top of the pipe 8″ above the top of the seal lost its entire seal in two discharges of the water-closet and bath-tub together. The volume of the water in the trap was sufficient, but the pipe was not long enough to allow of the formation of a column sufficiently high to resist the air-pressure.

(*g*) An 8″ pot-trap with 1′ 4″ extension lost no water, and allowed no air to pass under either of the four tests.

(*h*) The same results attended the tests on this trap, having an extension of only 12″.

(*i*) The trap was next tried with 9″ of extension, with the same results.

(*j*) The extension was finally reduced to 6″ bringing the top of the pipe

9″ above the top of the seal. In this case the water was driven out of the trap.

(*c*) A "Sanitas" trap was then tested, and the results were substantially the same as with the 8″ pot-trap.

Deductions from the Experiments on Back-Pressure.

From these experiments we learn (1) that in traps which are unventilated back-pressure may be resisted by constructing them in such a manner that they shall contain a large volume of water, and by setting them far enough below the fixture to admit of the formation in the waste-pipe above the trap of a column of water large enough to outweigh the back-pressure of the air.

(2) That the back-pressure in the tests herein recorded was sufficient to balance a column of water between 9″ and 12″ long, plus the depth of the water forming the seal. Calling the depth in the average trap 3″, our water column was not less than 12″ or 15″ in heighth. This is equivalent to one thirty-second or one twenty-fifth of an atmosphere, (0.43 or 0.56 lbs. to the square inch.)

(3) The back-pressure likely to be encountered in properly-plumbed houses will probably never exceed that obtained in the tests above recorded, since all the conditions most favorable to produce it were here combined. Hence any trap may be considered safe against back-pressure which is so formed as to contain a body of water large enough to

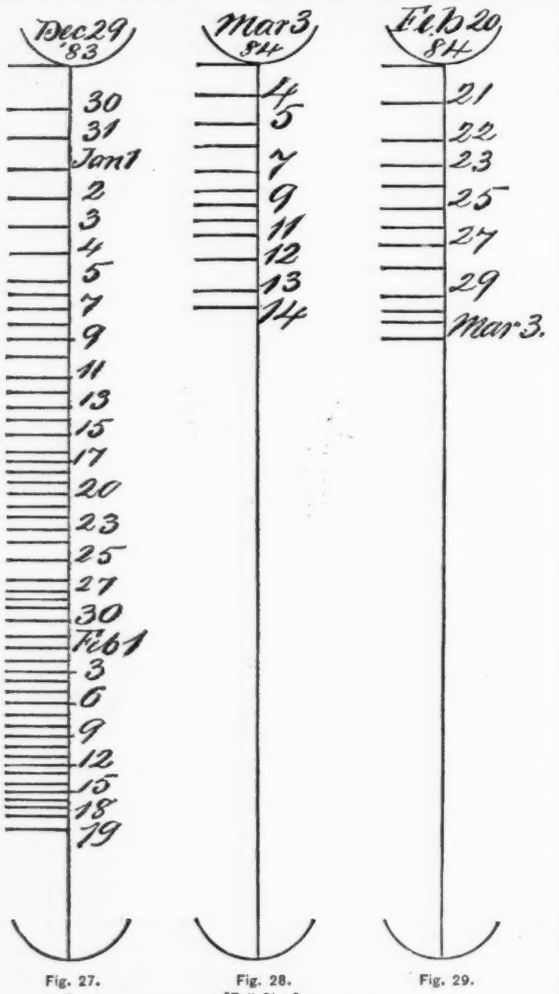


Fig. 27.

Fig. 28.

[Full-Size.]

Fig. 29.

fill the waste-pipe full to a height of 12″ or 15″ (including its own seal), and which is so set as to admit of the formation of this column.

(4) The following is the water capacity of the traps tested.

The 8″ pot-trap holds 5 quarts or 10 pints.
The 6″ pot-trap holds 3 quarts or 6 pints.
The 5″ pot-trap holds 2½ quarts or 5 pints.
The 4″ pot-trap holds 2½ pints.
The 3½″ pot-trap holds 2½ pints.
The 3″ pot-trap holds 2 pints.
The 2½″ pot-trap holds 1½ pints.
The 2″ pot-trap holds ¾ pint.
The 1½″ S-trap, with 5″ seal, holds ¾ pints.
The 1½″ S-trap, with 1½″ seal, holds ½+ pints.
The 1¼″ S-trap, with 1½″ seal, holds ½— pints.
The "Sanitas" holds 1½ pints.

A piece of 1½″ waste-pipe 12″ long holds about ¾ of a pint of water. A similar piece 15″ long holds a pint. Hence a trap used with such a waste-pipe should have a capacity of not less than ¾ pints. Accordingly all unventilated 1½″ S-traps and all unventilated 1½″ S-traps having less than 5″ seal are incapable of resisting the back-pressure liable to be encountered in plumbing.

III. EXPERIMENTS ON EVAPORATION PRODUCED BY TRAP-VENTILATION.

These experiments were made in the basement floor, as already explained.

They may be subdivided into (*A*) those in which the vent-pipe was conducted into a cold flue, and (*B*) those in which the vent-pipe was conducted into a heated flue.

(*A*) *Experiments on Evaporation produced by a Cold Ventilating-Flue.*

(*a*) 1½″ (scant) S-trap having a seal of 4½″ deep was attached to the end of the branch waste in the manner shown in Figure 1. A 1½″ rubber ventilating-pipe was taken from the 1½″ ventilating-opening *at the crown* of the trap, and conducted into a cold 4″ galvanized-iron ventilating-flue, shown in the drawing. This flue passed through two occupied offices (basement and first floor) whose temperature was maintained at about 68° Fahrenheit, during the term of the experiments, and through a chemical laboratory (second floor) whose temperature was maintained at about 60° Fahrenheit. For the remainder of its height the flue passed through a cellar and stairways, whose temperature was maintained at about 45° Fahrenheit. No artificial heat was applied to the flue.

The velocity of the movement of the current of air in the flue was measured by the anemometer. The daily rate of loss of seal by evaporation, and the velocity of the current in feet per minute is shown *in actual size* by the accompanying diagram, Figure 27.

We see that the loss averages about an eighth of an inch *per diem*. It amounts to about a quarter of an inch the first day, and gradually diminishes as the level of the water descends in the trap, and the distance of its surface from the ventilating current increases, to a little less than an eighth of an inch *per diem*. Hence an ordinary S-trap having an 1½″, or a 1¾″ seal would lose its seal in from nine to eleven days.

(*b*) The experiment was repeated several times at different parts of the year, from the middle of December to the middle of May, with substantially

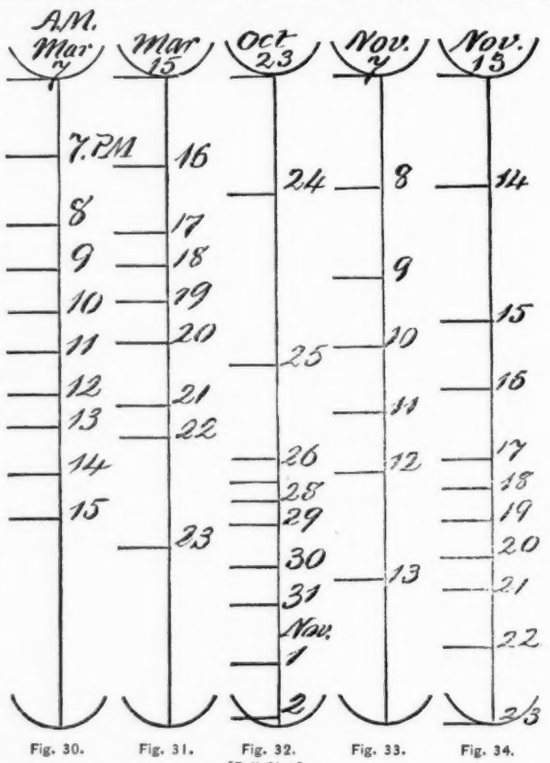


Fig. 30. Fig. 31. Fig. 32. Fig. 33. Fig. 34.

[Full-Size.]

the same results. Figure 29 represents the record of a second of these experiments.

(*c*) The same trap was now vented at the middle opening whose centre was 2″ below the centre of the upper opening. The rate of evaporation was somewhat slower, as shown by Diagram, Figure 28. This experiment was carried on only eleven days, inasmuch as by this time 1½″ of the seal had been destroyed, and the seal of ordinary machine-made S-traps does not exceed 1½″ or 1¾″

(*d*) The same trap was now ventilated at the lowest point, *i. e.*, 6″ below the crown. The evaporation in this case was exceedingly slow, and after the first two or three days was almost inappreciable.

(*e*) A number of experiments were then made on S-traps *unventilated*, but open at both ends as is the case in practice. The loss of water was almost inappreciable, not exceeding 1-32 or 1-16 of an inch in ten days.

(*B*) *Experiments on Evaporation produced by a Heated Ventilating-Flue.*

(*a*) A 1½″ trap having a seal 3½″ deep was tested. A 1½″ wrought-iron gas-pipe 6″ long connected the crown of the trap with a brick flue 8″ x 12″, heated by a stove. See Figure 1.

Diagrams, Figures 30, 31, 32, 33 and 34 represent five tests, two made in March, one in October and two in November of 1883. Here again the perpendicular lines represent, in *actual* length, the depth of seal of the trap. The upper arc represents conventionally the outlet mouth, and the lower arc the inlet mouth of the trap. The horizontal lines show the position of the water-level in the trap at the same hour in the morning of each day recorded in figures on the diagram.

We see here a very rapid diminution of the seal. The average loss *per diem* exceeded one-third of an inch or exactly four-elevenths of an inch. The smallest loss is one-eighth of an inch, and the largest nearly seven-eighths of an inch. The fixture side of the trap was closed during the tests.

(*b*) A second series of experiments was made with an ordinary 1½″ cast-lead trap having a seal 1½″ deep. The trap was connected with the heated flue at a point 3″ beyond the crown. Four tests were made. The loss of seal was much slower than in the former tests because of the distance of the mouth of the vent-pipe from the crown of the trap. The rate of evaporation, however, in these four tests averaged one-seventh of an inch a day; the greatest loss in any one day being three-eighths of an inch. In all these experiments on evaporation it was found to make no material difference in the results whether the fixture-end of the trap was open or closed, showing that evaporation at this point was inappreciable.

In the experiments on evaporation with the cold ventilating-flue, in the first experiment with the vent at crown, the anemometer recorded an average rate of movement of the ventilating current of 112,567′ or 20½ miles every twenty-four hours, or, with the correction for friction applied, of 94′ per minute.

In the second test, with vent at crown, the average was 85′ per minute; with vent 2″ from crown the average was 109 feet.

The velocity of the current during the cold months of the year was quite uniform. In the summer months, however, it was exceedingly variable, sometimes equalling that of the cold season, and sometimes ceasing entirely or even retrograding.

In the cold months the relation between the rapidity of evaporation and the velocity and dampness of the air-current was not accurately determined, the rate of evaporation being quite uniform in spite of considerable barometric fluctuation and change of velocity.

But in summer a change of the conditions of the atmosphere produced a very marked change in the rate of evaporation. On a few occasions of damp or rainy weather in the summer months, where the cold brick flue was used without a ventilating-cap on top, the seal actually gained slightly in depth, from condensation on the cold flue of the damp air of the soil-pipe, or from an actual fall of rain or moisture down the chimney. These accretions were, however, very rare, not occurring more than three times in the whole duration of the experiments.

The scientific investigation of this branch of the subject would require more elaborate apparatus and much more time than have been at our disposal; yet what records we have made have been made with accuracy.

Deductions from the Experiments on Evaporation.

From these experiments we find (1) that a rapid evaporation of the water-seal of traps takes place when they are ventilated at or near the crown, and that the evaporation goes on both in winter and in summer, and in ordinary unheated flues, as well as in flues artificially heated. The evaporation is most rapid in winter or with flues artificially heated, and slowest in summer, especially in damp weather. Hence it may be stated generally that the rapidity of the evaporation depends upon the velocity, temperature and hygrometric condition of the atmosphere.

(2) That in winter the evaporation produced by ventilation is so rapid as to destroy the seal of an ordinary 1½″ machine-made S-trap in from four to eleven days, according to the nature of the current.

(3) That without ventilation, or with the ventilating-flue taken from a considerable distance below the crown, the evaporation of the water-seal of traps is exceedingly slow, and that unventilated traps having a considerable water capacity may be considered perfectly secure against this danger unless they are left unused for years at a time.

It would obviously be impossible to devise a form of apparatus for experimental purposes which should cover all the varying conditions liable to be met with in plumbing practice. The position of the trap on the soil-pipe branch, the manner and position of connection of the branch with the main pipe, the amount of usage the pipes sustained, the manner in which the ventilating-flues were constructed, would all produce their effects upon the results. Nevertheless in every case where the ventilating-flue performed the office of producing a movement of the air within the pipes for which it was intended, and this air was absolutely saturated with moisture, the evaporation must of necessity go on in the manner recorded as the result of these experiments. How far the variation of the conditions would affect the rapidity of the loss of seal must be left to other investigators to determine. The apparatus used in the above recorded tests was fitted up exactly as is customary to fit it up for actual use. The entire length of the soil-pipe was kept much of the time wet during the experiments on evaporation, by discharges through it made for the tests on siphonage and back-pressure, precaution being of course taken by closing the inlet end of the trap against loss of its seal through these agencies, and the inlet at the end of the soil-pipe system, where the fresh air was taken in to produce the ventilating current above the trap, was distant as much as 60′ or 70′ from the traps tested. Hence the air was obliged to traverse a considerable length of damp soil-pipe, the greater part being nearly horizontal, on its way to the trap, and it may therefore be assumed it was conducted over as large an area of moist surface as it would ordinarily encounter in practice.

Moreover the result of our experiments in this direction accords with the experience of many sanitary engineers, health inspectors and plumbers who have recently had occasion, since the enactment of the Plumbing Laws in various parts of the country, to observe the effect of the provision requiring branch ventilation on the water-seal of the traps.

GENERAL CONCLUSIONS DEDUCED FROM THE EXPERIMENTS ON SIPHONAGE, BACK-PRESSURE, AND EVAPORATION.

From the foregoing experiments we deduce the following: —

(1) The ordinary form of machine-made small S-trap with shallow seal and without special ventilation is incapable of resisting the action of siphonage or back-pressure, even in a very mild form.

(2) A small S-trap, such as is used for lavatories and bath-tubs, even when hand-made, and of unusually deep seal is incapable without special ventilation of resisting the action of siphonage, or back-pressure in a mild form.

(3) Small S-traps when ventilated at the crown, with vent-pipes having a diameter the full size of the bore of the pipe, and of no unusual or excessive length are incapable of resisting the severe action of siphonage produced by the simultaneous discharge of certain forms of plunger water-closets, and ordinary bath-tubs under ordinary conditions likely to be encountered in practice.

Water-closets producing a powerful flushing of the soil-pipes when discharged, should not be prohibited on account of their siphoning power, because the periodical flushing of the soil-pipes by their use is productive of great good, and their siphoning action may be counteracted by other means.

(4) Special trap-ventilation when the vent-pipe is applied at or near the crown of the trap induces a current of air over the water which rapidly destroys the seal.

(5) Trap-ventilation when the vent-pipe is applied at a point so far below the crown as to avoid the danger of evaporation leaves the trap open to the danger of self-siphonage as well as of severe siphonic action. The position of the vent-pipe on the trap does not (at least within the limits covered by our experiments), materially affect the action of siphonage.

(6) Pot-traps of the ordinary sizes are incapable, without special trap-ventilation, of resisting the severest action of siphonage liable to be encountered in plumbing.

(7) Pot-traps of the largest size are expensive, and are open to the objections attending all cesspools. The positions of their clean-out caps is faulty, inasmuch as they are above the water line, and would fail to announce by a leakage of water, a faulty adjustment of the cap.

(Signed) J. P. PUTNAM,
L. FREDK. RICE.

OUR ILLUSTRATIONS.

DESIGNS FOR A TOMB BY MESSRS. T. M. KELLOG AND W. G. LAWRENCE.

THESE designs were prepared by a couple of students in the Architectural Department of the Massachusetts Institute of Technology, and are here introduced as a specimen of the work accomplished in that department.

DESIGN FOR A CHEAP COTTAGE. MR. TRISTAM GRIFFIN, ARCHITECT, BOSTON, MASS.

PARSONAGE FOR THE SOUTH CONGREGATIONAL SOCIETY, MIDDLETOWN, CONN. MESSRS. J. D. SIBLEY & SON, ARCHITECTS, MIDDLETOWN, CONN.

SKETCHES IN ULSTER COUNTY, N. Y. BY MR. A. E. DAVIS.

SEMI-DETACHED HOUSES, RICHMOND, VA. MR. M. J. DIMMOCK, ARCHITECT, RICHMOND, VA.

SCULPTURED DETAILS FOR THE NEW CITY HALL, PHILADELPHIA, PA. MR. JOHN McARTHUR, ARCHITECT; A. MILNE CALDER, SCULPTOR, PHILADELPHIA, PA.

CONCRETE FLOORS AND PAVINGS.[1] — II.

IF concrete and iron in combination are unavoidable for floors of large area having no intermediate supports beneath (and for practical reasons this does not seem to admit of doubt), and it is an absolute necessity that such floors should be, to all intents and purposes fire-proof, then the two materials, concrete and iron, should possess certain analogous qualities, and how far this is the case requires to be determined.

With regard to one of the most important points — capacity for deflection without rupture or permanent injury — the experiments made by Lieut.-Col. Seddon have proved that concrete possesses this quality (although against the usually accepted theory that concrete has no elasticity), in point of fact, more deflection than a cast or rolled iron beam could maintain within the limits of safety, and we may conclude, therefore, that iron joists or beams, no matter of what description, if strong enough for the purpose, cannot deflect sufficient to injure the concrete.

The next important point to ascertain is, to what extent Portland cement concrete can withstand the action of continuous and intense heat, and what are the relative degrees of expansion which take place in concrete and iron when subject to equal vicissitudes in this respect.

For ordinary purposes it would be comparatively a costly matter to clothe every portion of the encased iron with a great thickness of concrete, and to decide how much was really necessary, Mr. Hyatt constructed a furnace, the top of which was formed of a slab of concrete of three different thicknesses, and of a step-like form. In each step a flat bar of iron was embedded, the bars being respectively 2, 3, and 4 inches from

[1] Continued from page 213, No. 436. From the *Building World*.

the under side of the slab; in other words protected from the flames of the furnace by 2, 3, and 4 inches of concrete. Two small squares of metal, one tin, the other lead, were let into each bar of iron; upon these, rods or needles were made to rest in such a way that, on the melting of the metal, the needle would sink, and thus indicate the exact degree of heat at the time. The actual results were these: — the under side of the concrete was red-hot in two-and-a-half hours after the furnace was lighted; half an hour later, the iron protected by 2 inches of concrete was at a temperature of 250°; in five hours, 650°; and in twelve hours, 900°, or red-hot in the dark. The iron protected by 4 inches of concrete did not exceed 212° for five-and-a-half hours; in eight hours it was 450°; and at twelve hours, 550°, or less than the melting heat of lead, an intense heat being maintained the whole time. The iron protected by 3 inches of concrete stands in an unfavorable position when compared with the other two bars, as at the end of three hours it had attained a heat of 210°, and at twelve hours, 800°. This is accounted for by reason of its being the centre step of the three, and consequently exposed to the greatest heat; through being directly over the centre of the furnace. Unquestionably, therefore, an iron skeleton whose most prominent portions are covered with concrete 2 to 3 inches in thickness, will resist the attack of any ordinary fire without permanent injury, while not less than four inches in thickness would possibly render it comparatively secure against a fierce conflagration. But it may be suggested that the sudden application of streams of cold water on concrete which had attained a high degree of temperature would cause it to split up in fragments, and crumble to pieces. This would be so, no doubt, if the aggregate were composed of anything of a flinty character; but it is assumed that for fire-proof purposes the aggregate should of necessity be a material that has already passed the ordeal of fire, such as crushed bricks, slag, or coke.

Mr. Hyatt gave this part of the subject a practical test by forming the top of a furnace of concrete, 6 feet long, 2 feet wide, and 7½ inches thick; encased in the centre of this slab were some tie metals 1½ inches deep, in gridiron form, thus giving a thickness of 3 inches of concrete above and below. The furnace was made with a range of air-holes on either side to ensure perfect combustion and intense heat. Loose bricks were piled upon the furnace top, until a load was obtained of 300 lbs. to the square foot over the whole surface, the deflection with this load being $\frac{1}{32}$ of an inch in a span of 5 feet. The fuel was arranged to form an incandescent bed 6 inches thick at 12 inches below the under face of the concrete slab. The fire being kindled at six o'clock in the morning, had by eleven become an intense heat, perfectly uniform over the entire surface, and the bottom of the concrete was also at a glowing red heat all over. At this intensity the fire was kept up until 4 P.M., a period of ten hours from the lighting of it, and during which time the slab had deflected ⅜ of an inch. A stream of cold water was now thrown forcibly against the bottom of the slab for a period of from fifteen to twenty minutes, by means of a garden force-pump, and the load then removed. On examining the under side of the slab it was found uninjured, and the next morning — being then entirely cold — *the deflection had disappeared*, the slab having returned to its former level. In order to confirm these results, a second trial was made; this time the load was left upon the slab, which during the firing deflected as before, but upon cooling, returned to its original level, *lifting the load with it.*

In proof of the heat of the furnace it may be mentioned, that in the course of this experiment the faces of all the side bricks in actual contact with the fire were melted.

With regard to the relative degree of expansion of concrete and iron when subject to high temperature, Mr. Hyatt ascertained by experimenting with sticks of Portland cement — measuring the variations by Holtzapffel's thousandth's guage — that while wrought-iron expands .0014 with 180° of heat, cement expands .00137, or so nearly alike that no injurious results can possibly arise from the slight difference that is found to exist. But cement is not concrete, so another trial was made, by forming blocks of the latter material 14 inches long, 4 inches wide, and 3 inches thick, and in which bars of iron were embedded, the bars varying in size from 2 by $\frac{1}{32}$ of an inch to 2 inches square, and all 12 inches in length. On testing these by fire, no differences in effect were found to be produced on the concrete by the different masses of metal contained within them. As a final test, bars of iron 2 feet long by ½ inch thick, were embedded in concrete blocks, and exposed to the heat of a furnace for six hours, and found to be entirely sound and good when taken out and allowed to cool.

While dealing with the question of the fire-resisting properties of Portland cement concrete, it may be well to remark, on the authority of Mr. Hyatt, that there is no gain in using fibre of any description, not even asbestos, in its composition, but that Portland cement concrete of the best quality possesses non-conducting power of the highest order.

Having arrived at the satisfactory results so necessary to determine, 1st, that iron and concrete can be used together without any ill results from the deflection of the former or rigidity of the latter; 2d, that they are subject to the laws of expansion and contraction in the same degree, practically therefore being homogeneous in character; and 3d, that the most intense heat has no effect in destroying that homogenity, it becomes a question as to the best form in which to apply iron so as to obtain a maximum of results with the least materials.

The description of ordinary iron and concrete floors already noticed, depends entirely, as will be seen, on the strength of the former to uphold both the dead weight of the concrete and the live load to be carried.

The general idea on this subject has been to interweave a skeleton of light iron in the concrete, as for example, in Brannon's system.

In Homan's patent floors, rolled iron tee-girders are fixed at intervals, and a platform or stage is then set up level with the under side of the intended floor, on which is deposited a layer of concrete about an inch thick, necessarily of good quality, and the aggregate of which is broken up small for the purpose. On this concrete, and parallel with each other, are laid light flat metal bars of various sizes, having regard to the area of the floor. These bars are placed from 6 inches to 2 feet apart, according to circumstances.

Transversely to these bars others are laid in a similar way. The two series of bars are then riveted together where they cross each other, or screw-bolted with long screws which are allowed to stand up sufficiently to get a good hold in the upper layer of concrete. The ends of the tie-bars are securely fastened to the iron girders, or to iron brackets, or otherwise, so that they cannot be loosened, but shall remain rigid; upon the iron bars concrete of the thickness of from 4 to 6 inches is then deposited.

The system herein described is by no means a new one, but it is claimed that the method of fastening the "crossings," and ends of tie-bars, and of leaving bolts or screw-ends standing up so as to get a "key" into the concrete, are advantages not possessed by other principles of floor construction.

It is further claimed for Homan's system of flooring, that as the iron interlacing is placed so far from the neutral axis, it acts as a series of tension-rods, and that the slipping or sliding which would take place when any deflection of the floor occurred, is obviated by the screwed ends of the bolts used for securing the crossings being held tight in the upper portion of the concrete. Moreover, it is maintained that as the metal ties are fixed crosswise, the tension strains are provided for in both directions of the floor. Mr. Hyatt, however, submits that the best form in which to employ iron is in the shape of flat bars placed edgewise at regular intervals apart, with iron wire or rods passed through them in a transverse direction, and this gridiron arrangement to be embedded as low as possible below the neutral axis. The rods or wires would undoubtedly act as stops to prevent the bars from sliding, as the bolt ends do in Mr. Homan's floors; of course rolled iron or some other form of beam would be required at intervals in long spans.

Mr. Hyatt experimented also with the view of determining whether any other way of securing the tension-bars could be applied to advantage, such as in the form of a flat bow-string girder, and also by turning up the ends of the bars, so as to obtain the resistance to tension at their extremities, but with the result that tendency to slide was obviated equally as well by the wires or rods which passed through the bars at regular intervals in their lengths, and with the ends of the latter left free.

Other experiments were made to determine whether flat bars on edge gave increased strength in proportion as their depth was increased, and was proved to be the reverse, on account of the fact that the wider the bars the nearer their upper edges approached the neutral axis, or centre floor line, where tension would end and compression commence. A beam about 12 inches by 8 inches, having a 5 foot clear bearing, and with five bars of iron 2 inches wide embedded therein edgewise at equal distances apart, and the bottom edges fair with the bottom of beam, broke with 16,418 lbs. weight suspended in the centre, while a similar beam, under similar conditions in all respects, but the tie-bars 5 inches wide, broke with 25,868 lbs., practically showing that an increase of iron of 150 per cent gave about 50 per cent increase in strength only.

But simple, apparently, as the construction of iron and concrete floors appears, yet it has been the subject-matter of some scores of patents, to be increased before long, apparently, to a hundred or two. Whether one-half are valid or are ever practicable for ordinary floor construction is open to doubt. One of the oldest and best known systems, Dennett's, which was patented twenty-one years ago, had for its primary object the use of sulphate or carbonate of lime as a matrix, in combination with broken bricks or any other suitable material as an aggregate. As showing the opinion that prevailed with regard to fire-proof construction so late as twenty years since, Dennett's specification gives drawings of concrete floors where the bottom flanges of the girders are level with the ceiling, but described as entirely fire-proof. Portland cement has to a great extent taken the place of sulphate-of-lime in most instances where Dennett's construction is introduced. As to the walking surface most suitable for concrete floors, prejudice will always be in favor of wood, and where not covered by carpeting or by some similar material, there is nothing, it must be admitted, so comfortable. Where, however, carpet, linoleum, canvas, matting, or other ordinary coverings are used, a smooth cement surface is better than any other. It is more economical, quiet to the tread, affords no crevices for dust, or harbor for insects; and floor coverings last much longer than on boarded floors, where the edges of the boards as they warp create sharp ridges every few inches apart, and sooner or later disfigure and cut them to pieces. Where wood is, however, a *sine quâ non*, then wood-block flooring is the best thing to adopt, such as Wharam's, Lowe's, or Gregory's, or, if circumstances permit, parquetry laid on Eberhard's system, by which the glue holds equally as well to the concrete as to the wood. It is an absolute necessity, however, that the concrete should be perfectly dry — merely a surface appearance of dryness is insufficient—

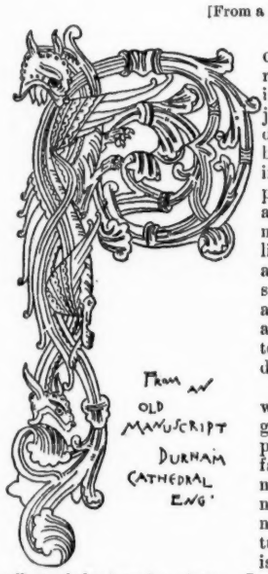
for should the block flooring, or parquetry be laid before the concrete is dry and hard throughout, the moisture being confined will rise to the surface and expand the blocks, which will burst up and become useless. So with floor-coverings capable of no free ventilation, such as canvas or linoleum, which by keeping down the latent moisture left in the concrete will engender damp and mildew, with all their unpleasant accompaniments, causing the cement floor to be inevitably condemned as both damp and unhealthy, whereas in reality, if care is exercised and time allowed for the moisture to evaporate, such a floor will, from a sanitary point of view, leave nothing to be desired. To lay wood joists on the concrete, and nail floor boards thereto in the ordinary way, is simply to make the floors fire-proof on one side and combustible on the other, and perpetuate the evils to which a wood floor contributes.

It has been attempted to form the upper portion of the aggregate of concrete floors of a material in which nails might be driven, such as coke, or crushed bricks of a softer character than is advisable throughout, and nailing thereto, in an ordinary way, in narrow widths, thin flooring boards.

There seems no reason, if the boards can be securely fastened in this manner, why this should not be a simple and effectual mode of applying wood flooring to concrete surfaces, such as basement rooms and similar places. Where a cement surface is applied as a finish to concrete floors, sharp silicious sand is objectionable, for the particles, as they become loose through wear, cut or "fret" up other portions of the floor with the attrition caused by walking, and instead of the surface wearing smoothly, it has the appearance of a nutmeg grater, and a rough, unpleasant feel to the feet. On the other hand, neat cement would be slippery and dangerous. The best admixture is granite or rag-stone chippings, or some material similar in nature and of equal hardness, broken up and mixed therewith, having previously been screened to eliminate all particles under the size of coarse sand, and again to take away all portions larger than a pea. The intermediary sizes having been washed, will, when mixed with the cement, wear evenly with the latter, and the surface of the floor will always remain firm, free from dust and pleasant to the tread.

POMPEII.

[From a Private Letter.]



POMPEII, February 10, 1884. — In two recently-excavated houses the paintings on the walls are as fresh as if just put on, and the halls are rich with decorations. Some of the marble tables are still standing; the fountains in the atrium and peristyle, with their pretty little statues and mosaics, look as if they might begin to play at any moment; the kitchen hearths, built like ranges, seem ready for their pots and kettles; a few flower-pots are still set in the gardens; in the store-rooms are some oil-jars and wine-jars; it is as if one might begin housekeeping to-morrow, and invite one's friends to dinner the day after.

One thing is difficult to conceive without seeing it, and that is the gorgeousness of the interiors of the private houses. The colors are now faded; the columns are broken; the mosaics of the floors are generally nearly destroyed; the fountains do not play; the flower-beds are destitute of flowers; yet, even as it is, one is continually amazed by the brilliant effect of the interior vistas. In one house the view from a triclinium across two courts, both surrounded by gaily-decorated Corinthian columns standing before walls painted from top to bottom in a variety of colors, is really dazing to the eyes. The old Pompeians lived in a rainbow atmosphere.

Another striking thing is the absolute cleanliness. You may say that the dirt has all been taken away by the Italian government. That is true, but it is quite evident that in the old times it never was there. Our modern houses are not made to be clean, as were the Pompeian residences. The walls, the floors, every corner of their homes were finished with the most admirable workmanship. In their rooms no plaster ever fell, for it was of such excellent material, and so well put on that it soon became like marble. They had no wooden walls, no cracks where dust could penetrate. Water for cleansing was found in every part of the house, and ran off through perfect drains. All the tables and bedsteads were of marble or bronze; even the well-curbs and the borders of the flower-beds were of hewn stone. Hygiene must have come naturally to the old Pompeian; he evidently had no chance to get a typhoidal attack; the only class of diseases he could not provide against were the eruptive, and one of these carried him off at last. . . .

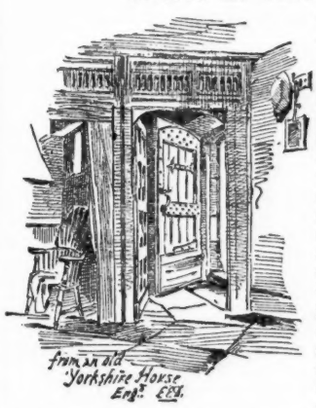
The excavations are going on steadily, and are admirably managed. It is a delight to see one room after another revealed to the light of day. The authorities are now beginning to replace the charred timbers of the roofs with new ones. In this way some second-story balconies are kept in place, instead of being allowed to fall down as formerly. Over some of the most richly-decorated houses the roofs are restored exactly as they were, with tiles made after the ancient patterns. . . .

You would be astonished at the size of some of the Pompeian houses, and of the rooms and spaces they enclose. They look small because they are so empty, but when you measure them you find them very spacious. Houses of thirty and forty rooms in the first story are not uncommon. The great space was the atrium, often thirty-five to forty feet long, having an opening for light in the centre of the roof, and just under this a marble-lined basin, raised above the floor, into which the rain fell, and on the margin of which were placed bronzes and vases. Out of this opened bedrooms, and at the end a reception-room and dining-room. Beyond these was a peristyle or court, surrounded by from eight to twenty columns, thus making a broad corridor running all around. Some of the peristyles were eighty or one hundred feet square, with a great variety of rooms opening into them. Beyond the peristyle was the garden, sometimes one hundred and fifty feet square, or more, with all sorts of arrangements for plants and fountains. A good many of the elaborate niche-shaped fountains are still perfect. The street entrances to some of the houses are ten to fifteen feet in width, and had quadruple or four-leaved doors. In fact, so spacious are these dwellings on the ground floor that it is generally believed that the upper-story rooms were rented out. . . .

The floors of the first and second stories were of cement in which patterns of mosaic or tesselated work were laid. Many of these floors are uninjured. . . . The houses were admirably planned to save space; and the decorations, mural and otherwise, were far beyond our conceptions of the art of ornamentation. The workmanship, especially the plaster and stucco, was much better than can be produced by our modern craftsmen.

In examining Pompeii it is necessary to remember that it was a small provincial city, bearing about the same relation to Rome that Auburn or Utica does to New York. This increases our wonder in walking through its well-paved streets, or its richly-adorned houses, or about its theatres and temples and squares, or in studying the thousands and thousands of art-objects in terra-cotta, bronze, silver, gold, alabaster, marble and glass, which have been discovered within its walls—even with less than half the city excavated.

PROFIT IN STREET REFUSE.



TO turn street sweepings and house refuse of all sorts into money is the object of a strange machine now ready for work at the Jackson Street (East River) wharf, New York, of the Street Cleaning Department. Of course, the conversion is not direct. Rags, old iron, broken glass, bones, cinders, and coal, are the media of change. The machine is simply a vast rag and bone picker of many Italian-power, working by steam. The idea is a new one. Less than twelve months ago the machine was erected by a stock company on the Jackson Street wharf, Commissioner Coleman's permission having been first obtained. Most of the intervening time has been given up to experiment, but now, it is said, the machine is perfected, and will sift and reduce to its elements all the refuse of whatever description that may be brought to it, to the extent of 150 loads of 1800 pounds each in a day of 10 hours. The average amount of stuff brought to this wharf is estimated at 40 loads *per diem*, so that the sifter cannot be worked to anything like its full capacity. Out of 100 loads of ordinary refuse thrown into the sifter, it is claimed, only about 30 loads remains to be sent down the bays in the scows, the rest being utilized in one way or another.

The sifting-machine occupies a space about 40 feet long by 10 feet wide, covered with a shed on the end of the wharf. This shed is approached from the street end by an inclined plane which reaches nearly to its roof. The ash and garbage carts drive up this plane to a shute, through which they discharge their contents into the sifter within the shed. The matter falls on a tray, which has a resemblance to an old-fashioned Venetian blind extended horizontally. The weathers are so arranged that only narrow slits remain between them, through which nothing but fine dust can find its way. This tray is called the "oscillator." It moves to and fro in the direction of its length 250 times a minute, and, as it rocks, the stuff that has been thrown on it is distributed automatically along its entire length, which is about 10 feet. Two or three Italians stand alongside, and pick all the rags and scraps of paper out of the mass. These are spread out near by to dry. All the fine dust falls through the slits in the oscillator into a narrow trough called the "conveyor," which

will be further described presently. The solid residuum on the tray of the oscillator — the dust and the rags having been removed — is passed automatically into a vat of water called a "washer." The passage of a load of refuse through the oscillator takes about four minutes. In the washer the solid mass that comes from the oscillator is rapidly stirred up. All the straw, fragments of leather, vegetable refuse and other light material rises to the surface; whence it is removed by Italians to a cremating furnace, and reduced to fine ashes. The coal, cinder, iron, glass, and other heavy objects fall to the bottom of the washer. They are passed through a second vat to cleanse them thoroughly, and from this they emerge strewn on a broad rubber, which moves slowly over rollers. Italians stand on each side. They pick out the bones, pieces of iron, and glass, and stones. The belt discharges the coal and cinder, which remain in a heap. The fine dust which falls from the oscillator is kept in constant motion through the trough of the conveyor by means of a ribbon of metal twisted spirally about a shaft rotating lengthwise in the trough. The dust is taken up by automatic elevating buckets from the end of the conveyor, and by them discharged into the scow.

"The contrivance is of advantage both to the city, and to the stockholders," said Mr. James Medhurst, the foreman in charge of the works.

"How to the city?" asked the reporter.

"Why, instead of 150 loads of stuff, they have only 30 to transport down the bay when we get through, and then the stuff we leave them is so clean and healthy that it can be used for any purpose. You see, we burn all the garbage and put only fine, dry dust on board the scows. It would be perfectly proper to use it for filling-in, for there is nothing to decay in it; but if it be simply thrown into the bay it will sink to the bottom and stay there, like sand. There will be no nasty garbage to wash ashore at Coney Island, or float over the harbor for weeks."

"How do the stockholders' profits come in?"

"Well, the rags fetch about $20 a ton; the old iron will fetch 40 cents a hundred pounds; broken glass is worth 30 cents a hundred pounds; bones are more valuable. Out of every load of 1800 pounds we get about 400 pounds of coal and cinder. We have sold none of it yet, but we have had all the fuel we needed to keep our machinery running. It is capital fuel, and we expect to be able to sell it when we get fairly to work. Yes, we consider our enterprise a perfect success, and we hope in time to have engines at every city wharf, and handle all the refuse of the Street Cleaning Department with profit to ourselves and the city." — *The Metal Worker.*

AMERICAN INSTITUTE OF ARCHITECTS.

TRUSTEES' MEETING.

American Institute of Architects,
Secretary's Office, 10 Catherine Street,
Newport, R. I., May 26, 1884.

To the Editors of the American Architect: —

Dear Sirs, — A quarterly meeting of the Board of Trustees A. I. A. was held in the Institute rooms, Bryant Building, New York, on the 16th day of April, and a regular meeting on the 21st day of the current month. Both meetings were well attended, and business of importance transacted.

At the quarterly meeting the By-Laws and general papers relating to the formation of a Chapter of the A. I. A. in the city of St. Louis were presented. The documents being in proper form and the Association fully organized and officered in accordance with the requirements of the constitution, it was voted: That the St. Louis Association be admitted to the Institute union as the St. Louis Chapter of the American Institute of Architects. The officers of the new Chapter are as follows: President, H. G. Isaacs, F. A. I. A.; Vice-President, F. D. Lee; Secretary, H. W. Kirchner, A. A. I. A.; Treasurer, E. Jungenfeldt.

The following applicants were elected to the Associate grade: F. W. Vogdes, of Indianapolis, Ind.; J. McDonnell, of Green Bay, Wis.

At the monthly meeting in May a communication was received from Eugene H. Taylor, Secretary of the Architectural Association of Des Moines, Iowa, enclosing the Constitution and By-Laws of that Society, together with an interesting account of the various steps which have been taken by its members towards elevating and advancing the interests of their art.

E. Townsend Mix, of Milwaukee, Wis., was by vote promoted from the Associate to the Fellowship grade.

Much interest is being developed throughout the United States in the work of the Institute, and numerous applicants for membership are now awaiting the action of its Board of Trustees.

Respectfully, George C. Maron, Jr.,
Secretary, A. I. A.

GLASS-CASED TRAPS.

Brooklyn, May 27, 1884.

To the Editors of the American Architect: —

Dear Sirs, — Noticing your article on traps, in your issue of May 24, 1884, you say that all traps having sections constructed of glass, for the purpose of permitting the inspection of interior, were usually so formed that it is impossible in practical use to know whether they are full or empty. If you will examine the wood-cut of my patent glass-traps marked Figure 2, in my illustrated catalogue, you will see that my trap shows the whole water-seal, and has been thoroughly tested by the engineers connected with the Boards of Health of New York and Brooklyn, and pronounced by them to be non-siphoning; and it has been proved by a prominent architect of this city, who made a test with them on evaporation (during the absence of his family from the city) for the period of four months, and he found that the amount of water evaporated during that time was not even perceptible, which proves the impossibility of destroying its seal by evaporation.

You will also notice the absence of any angle, upon which grease or sediment would be liable to form or collect; and I never heard of a single instance, from the many thousands now in use, "of the glass-bulb becoming so stained as to obscure the line of water-seal;" and its action is such, that it is self-scouring, cleaning its own surface at each discharge of the fixture to which it is attached. From the tests made it would take two years to evaporate the water out of my trap, before the seal could be broken. Yours respectfully,

J. Connolly.

THE PRINCIPLES OF GLASS-MAKING.

May 26, 1884.

To the Editors of the American Architect: —

Dear Sirs, — To A. H. R. and others, "*The Principles of Glass-Making,*" published by Geo. Bell & Sons, Covent Garden, London, can be purchased at Cupples, Upham & Co.'s book store, 283 Washington St., Boston. Yours respectfully, Donald Macdonald.

THE LIQUEFACTION OF PERMANENT GASES.

New York, May 26, 1884.

To the Editors of the American Architect: —

Dear Sirs, — I wish to correct the statement made in your editorial on the liquefaction of gases, in the issue of May 24, that hydrogen has not yet been reduced to the liquid condition.

This was accomplished first by M. Cailletet, at Paris, on December 30, 1877, he obtaining hydrogen vapor, and possibly solid particles, and on January 10, following, M. Pistet, of Geneva, succeeded in liquefying, and then *solidifying* the gas, it having a steel-blue tint.

For description and illustrations of the apparatus used by these investigators, see the article "Hydrogen," in the *Encyclopædia Britannica,* ninth edition. Yours truly, Michel M. LeBrun.

NOTES AND CLIPPINGS.

Burning of the Stadt Theatre, Vienna. — The Stadt Theatre was destroyed by an incendiary fire on May 16, a few hours before the evening performance.

The New Orleans Exposition Main Building. — The Boston *Herald* says that the main building of the New Orleans exhibition is in some respects the most remarkable edifice ever built in this country. It is much the largest exposition building ever erected in the world. The architect has succeeded, at a moderate cost, in producing the largest single room, every part of which can be seen from any point, of which there is any knowledge. The building is 1378 feet long by 905 feet wide, and covers 33 acres, or 11 acres more than the Philadelphia Centennial Exposition of 1876. There are 1,656,300 square feet of floor-space, including the gallery. The reader may form a better impression of the vast dimensions of the structure by imagining three ordinary city blocks one way and five the other covered by a solid roof. And, if he chooses to allow his fancy to carry him still farther, he can picture a monster panorama of the world's industry, extending before his vision uninterrupted by a single object except the supports. The active commercial rivalry of the different sections is aptly shown by the distribution of contracts for the materials. The roof, which will cover 1,000,000 square feet, is being made in Cincinnati. The window sashes come from Milwaukee, Wis. The glazing will be done by St. Louis parties. Four thousand kegs of nails are being shipped from Wheeling, W. Va. Nine million feet of Mississippi lumber will be consumed. A massive group in bronze, typical of America, to be placed over the main entrance is being made at Canton, O., as are also a statue of Washington and Columbus, and coats of arms of all the states, which will appear in medallion form as part of the exterior ornamentation. Finely modelled cornices are being made at New Orleans. The building will be 60 feet high, with a tower 115 feet high, and the architect has been fortunate in rendering the exterior unique and attractive. A platform will be erected on the tower, reached by elevators, from which visitors may have an exceptionally fine view of the city of New Orleans, the exposition grounds, the Mississippi river and the surrounding country. There will be one line of gallery extending around the entire circumference of the building, to which visitors will be carried by 20 steam and hydraulic elevators, representing all the manufacturers of these conveyances in this country. The music-hall, situated in the centre of the building, will be 364 feet wide and will comfortably seat 11,000 persons. A platform is being built for 600 musicians. To light the building with incandescent lamps will require 15,000 lights and 1800-horse power. To light with the arc system will require 700 lamps and 700-horse power to operate the dynamo. The total steam required for lighting and for the machinery-hall will be at least 3000-horse power. In this estimate is included the power for five arc-lights of 36,000-candle power each, which will light the grounds. These are the largest single lamps ever constructed. The cost of this great structure, lacking no single desirable feature for the purpose intended, will only be about $400,000, and the other buildings will be proportionately inexpensive.

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

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

BUILDING PATENTS.

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

298,990. COMPRESSED-AIR WATER-ELEVATOR. — John K. Leedy, Tom's Brook, Va.

298,995. CLAMP FOR FRAME-SAWS. — Andrew McNiece, Newark, N. J.

299,001. SHUTTER-WORKER. — Dr. Franklin Oliver, Huntsville, Mo.

299,008. HOT-AIR AND STEAM-GENERATING FURNACE. — Wm. Pullinger, Philadelphia, Pa.

299,036. FIRE-EXTINGUISHER. — George W. Taylor, Abner R. Cox, William Carrel Brown, and John N. Sutherland, Belton, S. C.

299,067. BRICK-MACHINE.—William L. Gregg, Philadelphia, Pa.

299,080. DOOR-SPRING.—Philip McAleer, Washington, D. C.

299,088. COMPOSITION OF MATTER TO BE USED AS A FIRE AND WATER PROTECTIVE PAINT. — Franklin L. Putt and J. B. Stratton, Middlebury, Ind.

299,089. WEATHER-STRIP. — Perry E. Reynolds, King City, Mo.

299,092. STONE-CHANNELING MACHINE. — William L. Saunders, Jersey City, N. J.

299,093. STONE-CUTTING MACHINE. — William L. Saunders, Jersey City, N. J.

299,137. WINDOW-SCREEN. — Sedgwick R. Hazen, West Jersey, Ill.

299,139. COTTON-PRESS. — Cyrus David Heflin, Roanoke, Tex.

299,143. ADJUSTABLE CURTAIN-FIXTURE. — Chas. F. Hiney, Pottsville, Pa.

299,146-147. FURNACE-GRATES. — Thos. Kirkwood, Chicago, Ill.

299,149. DOOR-HANGER.—William J. Lane, Poughkeepsie, N. Y.

299,153. PLANER-KNIFE. — Peter McCourt, Appleton, Wis.

299,172. DAMPER. — Joseph W. Shaw, St. Louis, Mo.

299,175. CHIMNEY-TOP AND VENTILATOR. — John M. Sheets, Nora Spring, Io.

299,181. PANEL FOR WALLS, CEILINGS, ETC.—Louis C. Tiffany, New York, N. Y.

299,194. CIRCULAR-SAW MILL. — Robert M. Beck, Chambersburg, Pa.

299,199. SASH-CORD FASTENER. — Roswell N. Brown, Hoosick Falls, N. Y.

299,213. WATER-METRE. — Benaiah Fitts, Worcester, Mass.

299,217. SASH-HOLDER. — George E. Gorham, Albany, N. Y.

299,222. AUTOMATIC SAFETY APPLIANCE FOR ELEVATORS. — John Hodges, Westfield, N. J.

299,224. LIFTING-JACK. — Jas. H. Humbert, Onan, Va.

299,226. DRY-CLOSET. — Thomas W. Jackson, San Francisco, Cal.

299,227. CHIMNEY-CAP AND VENTILATOR. — Wm. J. Kayser, Milwaukee, Wis.

299,233. CIRCULAR-SAW MILL. — Walter J. F. Liddell, Charlotte, N. C.

299,239. SPRING SHADE-ROLLER. — Gideon B. Massey, Mount Vernon, N. Y.

299,241. FOLDING TABLE. — John McGrath, New York, N. Y.

299,246. SASH-FASTENER. — Robert T. Murphy, Westminster, S. C.

299,255. METALLIC CEILING. — Albert Northrop, Pittsburg, Pa.

299,256. SPRING CURTAIN-ROLLER. — Walter B. Noyes, Detroit, Mich.

299,257. WINDOW-SCREEN. — S. Eugene Parrish, Lowell, Mich.

299,313. LIMEKILN. — Bernhard Albers, Conception, Mo.

299,325. WIND-ENGINE. — David H. Bausman, Lancaster, Pa.

299,327. WINDMILL. — George M. Beard, Auburn, Ind.

299,331. WELL-PIPE CUTTER.—Alfred Willard Benson, San Bernardino, Cal.

299,332. WATER-CLOSET ATTACHMENT. — James W. Birkett, Brooklyn, N. Y.

299,335. SASH-HOLDER. — Gilbert C. Bolgiano, Baltimore, Md.

299,341. ATTACHMENT FOR OPERATING CISTERN-VALVES FOR WATER-CLOSETS. — Daniel Burrows, Brooklyn, N. Y.

299,374. DRAWER-PULL. — Owen F. Garvey, Pawtucket, R. I.

299,386. GLAZED METALLIC ROOF AND SKYLIGHT. — George Hayes, New York, N. Y.

299,387. SKYLIGHT. — George Hayes, New York, N. Y.

299,425. WATERPROOFING CELLARS, ETC. — John J. Schillinger, New York, N. Y.

299,432. WINDOW.—William D. Smith, Chester, Pa.

299,435. COMBINED CARPENTER'S SQUARE AND BEVEL. — Ransom Steele, New Britain, Conn.

299,473. HATCHWAY-GATE FOR ELEVATORS. — Leland Hixson, Washington, D. C.

299,476. OVERFLOW-TRAP FOR WASH-BASINS, BATH-TUBS, ETC. — William T. Jebb, Buffalo, N. Y.

299,480. SAW-GUARD. — Henry F. Kuhlmann, Merritt F. Robinson, and Edward S. Irvin, Indianapolis, Ind.

299,483. WINDOW-SHADE PULL. — William Lang, Brooklyn, N. Y.

SUMMARY OF THE WEEK.

Baltimore.

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

Geo. C. Hershman, 12 two-st'y brick buildings, n s Biddle St., bet. Eusor St. and Holbrook Alley; and 4 two-st'y brick buildings, e s Streeper St., bet. Elliott and O'Donnell Sts.

Geo. Mason, three-st'y brick building, n e cor. Broadway and Madison St.

Sheep Butchers and Wool Pulling Association, No. 2, 4 two-st'y brick buildings, e s Pennsylvania Ave., bet. Robert and Laurens Sts.

Mary L. Credit, 2 three-st'y brick buildings, rear n e cor. Howard and Cross Sts.

Ferdinand Schultz, three-st'y brick building, e s William St., bet. Cross and West Sts.

Anton Stricker, three-st'y brick building, e s William St., bet. Cross and West Sts.

Wm. E. Bowman, two-st'y brick warehouse, s w cor. Eastern Ave. and Eden St.

Peter McGovern, 2 two-st'y brick buildings, s s Winter St., bet. Creek Alley and Race St.

Boston.

BUILDING PERMITS. — *Brick.* — *Newbury St., No.* 265, Ward 11, for J. W. Shapleigh, dwell., 23′ x 57′, three-st'y mansard; Antoine Xavier, builder.

Weston St., an apartment-house, four-st'y, 50′ x 70′, is being built for Mr. J. McNamara; from plans of J. H. Besarick, architect; James Fagan, contractor.

Messrs. Van Brunt & Howe are architects of the new mortuary chapel now being built at Forest Hills Cemetery; James Fagan and Creesy & Noyes, contractors.

Brooklyn.

BUILDING PERMITS. — *Ross St.* s s, abt. 150′ e Kent Ave., two-st'y brick factory and mill, felt, cement, and gravel roof: cost, $6,000; owner, Oscar F. Hawley, cor. Bedford Ave. and Rodney St.; architect, E. F. Gaylor; masons, Wm. & T. Lamb, Jr.

Butler St., s w cor. Nostrand Ave., two-st'y brick stable and car-house, gravel and felt roof; cost, $10,500; owner; Atlantic Ave. R. R. Co., cor. Atlantic and Third Aves.; architect, George W. Anderson; builder, not selected.

Putnam Ave., s s, 355′ e Tompkins Ave., 4 two-st'y brick dwells., tin roofs; cost, $5,800; owner, etc., Robert Little, Willis Ave., New York.

Putnam Ave., n s, 100′ w Reid Ave., 5 two-st'y brown-stone dwells., tin roofs; cost, about $5,000 each; owner, architect and carpenter, F. C. Vrooman, 444 Gates Ave.

Union St., s s, 82′ e Seventh Ave., 5 two-st'y brown-stone dwells., tin roofs; cost, $10,000 each; owner, etc., Wm. Flanagan, 46 Berkeley Pl.

South Second St., No. 291, n s, 75′ e Seventh St., three-st'y brick tenement, tin roof; cost, $6,500; owners, William and Jane O'Brien, 293 South Second St.; architect, A. Herbert; builder, Jacob Bisson.

Warren St., s s, 25′ w Hoyt St., four-st'y brick tenement, tin or gravel roof; cost, $10,000; owners, Ann Reagan and Margaret Newman, 178 Wyckoff St.; architect and builder, P. Williams.

Halsey St., s s, 395′ w Marcy Ave., 2 three-st'y brick and brown-stone dwells., tin roofs; cost, each, $6,500; owner, John Fraser, 16 Rochester Ave.

Putnam Ave., n s, 420′ w Tompkins Ave., 2 two-st'y brown-stone dwells., tin roofs; cost, each, about $5,000; owner, architect and carpenter, F. C. Vrooman, 444 Gates Ave.

Clinton St., w s, 25′ n Amity St., three-st'y brick and brown-stone dwell., tin roof; cost, about $9,750; owner, A. T. Bristow, 253 Clinton St.; architect, F. E. Lockwood; builders, H. D. & W. A. Southard.

Clinton St., n w cor. Amity St., three-st'y brown-stone dwell., tin roof; cost, about $14,000; owner, Stewart Church, 294 Clinton St.; architect, Fred. E. Lockwood; builders, H. D. & W. A. Southard.

Louis Pl., w s, 144′ s Herkimer St., 3 two-st'y brown-stone dwells., tin roofs; cost, each, $5,000; owner, K. T. Peters, 2166 Atlantic Ave.; architect, H. Phrele; builder, Charles Lorentz.

Manhattan Ave., e s, 150′ s Meserole Ave., four-st'y frame store and tenement, felt and gravel roof; cost, $5,800; owner, Wilson Abimity, 83 Oakland St.; architect, Jas. Mulhaul; builders, Post & Walker.

Meserole St., s s, 50′ w Graham Ave., four-st'y frame store and tenement; cost, $7,000; owner, Fred. Schwinn, 150 Meserole St.; architect, John Platte; builder, J. Rauth.

Ewen St., e s, 50′ n Meserole St., three-st'y frame store and tenement, tin roof; cost, $5,000; owner, Peter Glassgen, 156 Ewen St., architect, John Platte; builders, Jacob Rauth and Franz Herte.

Monroe St., n s, 140′ e Reid Ave., 3 two-st'y brown-stone dwells., tin roofs; cost, each, $3,500; owner and builder, Geo. F. Chapman, 681 Monroe St.

Grand St., No. 594, three-st'y brick store and tenement, tin roof; owner, Joseph Carney, 257 Hewes St.; architect, John H. Garrison; builder, C. F. Canfield.

Prospect Pl., No. 200, s s, abt. 300 w Vanderbilt Ave., three-st'y brick dwell., tin roof; cost, $4,500; owner, Robert Fury; arcnitect, P. B. Rogers.

Third Pl., n s, 75′ w Clinton St., 2 three-st'y brick dwells., tin and slate roofs; cost, each, $6,000; owner, etc., William Taylor, 83 Third Pl.

Jackson St., n s, 100′ e Ewen St., two-st'y brick storage and stable, tin roof; cost, $6,000; owner, Valentine & Co.; architect and carpenter, O. H. Doolittle; mason, S. V. Hyers.

Ma ison St., s s, 400′ e Tompkins Ave., 2 two-st'y brown-stone dwells., tin roofs; cost, each, $4,500; owner, etc., Chas. Isbill, 593 Herkimer St.

Lynch St., n s, 284′ 4″ w Marcy Ave., 4 three-st'y frame tenements, tin roofs; cost, each, $4,000; owner, Margaret Mulvihill, 736 Van Buren St.; architect, John Herr; builder, Nicholas Mulvihill.

Greene St., No. 185, three-st'y frame tenement, gravel roof; cost, $4,000; owner, Daniel Dunn, on premises; architect, John P. Lee; builders, Gately & Smith, and James Doig, Jr.

Locust St., Nos. 14 *and* 16, s s, 125′ e Broadway, 2 three-st'y frame tenements, tin roofs; cost, each, $4,900; owner, Bernhard Muelier, 29 Scholes St.; architect, Th. Engelhardt; builder, Wm. Maske.

Bond St., w s, 120′ s Union St., three-st'y brick tenement, tin roof; cost, $4,000; owner, Michael Gillan, 326 Bond St.; architect, Chas. E. Hebberd.

Manhattan Ave., e s, 75′ n Nassau Ave., three-st'y frame store and tenement, gravel roof; cost, $3,600; owner, Mary Marks, 121 Manhattan Ave.; architect, —— Conroy; builders, Randall & Miller.

Clason Ave., No. 92, w s, 175′ s Flushing Ave., three-st'y frame tenement, tin roof; cost, $3,500; owner and carpenter, George Frey, 230 West Thirty-first St., New York; architect, Richard Von Lehn; builder, C. Dahnken.

Melrose St., n s, abt. 200′ e Central Ave., 3 three-st'y frame tenements, tin roofs; cost, $4,500; owner and architect, W. Wahl, cor. Central Ave. and Myrtle St.; builders, J. Armendinger and John Rueger.

Greene Ave., n s, 40′ e Waverley Ave., 3 three-st'y brown-stone dwells., tin roofs; cost, each, $7,000; owner, George Harvey, Washington Ave.; architect and builder, H. E. Fickett.

Lee Ave., No. 189, e s, 80′ s Rutledge St., two-st'y brown-stone dwell., tin roof; cost, $5,800; owner, H. Mangles, 13 Pulaski St.; architect, F. Weber; builders, —— McGorlin and John J. Brennan.

Broadway, n e cor. Van Buren St., 2 three-st'y stores and flats, tin roofs; cost, $5,500; owner and carpenter, S. W. Post, 815 Van Buren St.; mason, A. A. Fardon.

Sixth Ave., n w cor. Seventeenth St., three-st'y frame store and dwell., tin roof; cost, $4,500; owner, Frederick Schwartje, Atlantic Ave., s w cor. Third Ave.; architect, W. H. Wirth; builders, Powderly & Murphy.

Quincy St., s s, 216′ e Reid Ave., 3 two-st'y brown-stone dwells., tin roofs; cost, each, $4,000; owner, A. S. Walsh, Madison St., near Stuyvesant Ave.; architect, A. Miller.

Evergreen Ave., n e cor. Harmon St., three-st'y frame store and dwell., tin roof; cost, $4,000; owners, architects and builders, Cozine & Gascoigne, 307 Evergreen Ave.

Willoughby Ave., n s, 100′ w Throop Ave., 2 three-st'y brown-stone dwells., tin roofs; owner, Jos. Henderson, 633 Willoughby Ave.; architect, Amzi Hill; builder, S. C. Phillips.

ALTERATIONS. — *Fulton St., No.* 1155, three-st'y brick extension, tin roof, front and rear walls altered, etc.; cost, $7,000; owner, George Boemermann, Bedford Ave., near Gates Ave.; architect, George P. Chappel; builders, Van Pelt & Pierce, and Myron C. Rush.

Bridge St., No. 407, three-st'y brick extension, gravel and tin roof, front and rear walls altered; also interior alterations; cost, $8,000; owner, Henry Mugge, 41 Bond St.; architect, M. J. Morrill; builders, M. J. Reynolds & Son, and O. K. Buckley.

Henry St., No. 331, add two stories, front rebuilt, and interior altered; cost, $6,000; owner, K. H. Ludwig, 312 Hicks St.; architect, C. Werner.

Ninth St., n s, 203′ e Gowanus Canal, chimney to be 115′; cost, $4,000; owner, New York Tartar Co., Ninth St. and Gowanus Canal; builders, Berton & Nickels.

Willow St., No. 91, one-st'y brick extension, interior alterations; cost, $5,000; owner, Thomas S. Moore, 102 Broadway, New York; architect, W. B. Tubby; builder, F. D. Norris.

Kosciusko St., Nos. 559-567, raised 2′, brick walls beneath, rear walls rebuilt, etc.; cost, total, $4,000; owners, Fleer Bros.; builder, W. H. Rhodabeck.

Chicago.

BUILDING PERMITS.—W. D. Kerfoot & Co., 5 one-and-one-half-st'y cottages, 101-121 Iowa St.; cost, $10,000.

G. Turney, two-st'y store and dwell., 252 Waubansia St.; cost, $3,000.

M. M. Rothschild, 3 three-st'y dwells., Thirty-second St., and Indiana Ave.; cost, $12,000; architects, Adler & Sullivan.

G. C. Hutchinson, two-st'y dwell., 339 Ashland Ave.; cost, $5,000; architect, L. G. Halberg; builders, Geo. Lehman & Co.

Geo. S. Bullock, three-st'y stores and flats, 283 and 285 Ogden Ave.; cost, $10,000; architect, M. C. Dean; builder, J. Moran.

S. Klager, three-st'y store and flats, 1132 Milwaukee Ave.; cost, $7,700.

M. Ullrich, two-st'y dwell., 585 Lasalle Ave.; cost, $6,000; architect, E. Baumann; builder, C. Prussing.

Penn. Coal Co., shelter-shed, Twenty-second St. and Chicago River; cost, $10,000.

H. Shulz, two-st'y dwell., 938 Ashland Ave.; cost, $3,000; architect, A. Chirweat.

A. J. Snell, two-st'y dwell., 6 South Elizabeth St.; cost, $5,000; architect, A. Smith; builder, F. Hausen.

Geo. Bullen, four-st'y malt-kiln, 307 and 309 Michigan St.; cost, $30,000; architects, Burling & Whitehouse; builders, Rossler & Winckler.

Ph. Emradth, two-st'y dwell., 166 Wesson St.; cost, $3,500.

Wm. Thilo, 2 three-st'y flats, 811-815 Halsted St.; cost, $7,000; architect, H. T. Kley.

Mrs. N. Halsted, 3 two-st'y dwells., North Park Ave.; cost, $12,000; architects, Adler & Sullivan; builder, J. Pedgrift.

Mrs. A. Kiley, two-st'y dwell., 447 Thirty-first St.; cost, $3,200.

E. W. Morrison, 11 three-st'y dwells., 192 to 208 Sebor St.; cost, $40,000.

Wm. Henderson, two-st'y dwell., 467 West Congress St.; cost, $6,500; architect, N. S. Patton.

P. McEwan, four-st'y store and flats, 89 and 91 West Madison St.; cost, $10,000; architect, W. H. Drake.

S. P. Parmly, two-st'y stores and flats, 3452 and 3454 Indiana St.; cost, $5,000; architect, P. L. Charnley; builder, J. Cox.

P. Cummings, four-st'y flats, 333 North Franklin St.; cost, $6,200; architect, P. L. Charnley; builder, M. Foley.

E. J. Lehmann, three-st'y store and flats, 885 and 887 North Clark St.; cost, $12,000; architects, Treat & Foltz.

W. H. Garrison, 2 one-st'y cottages, 917 and 919 Hoyne Ave.; cost, $3,000.

R. M. Prendergast, three-st'y dwell., 7 Boston Ave.; cost, $7,000; architect, J. V. Wadskier.

A. Ballard, 4 three-st'y dwells., 1510 to 1516 Michigan Ave.; cost, $30,000; architect, Beman.

Chicago North Division Railway Co., two-st'y stable, Ogden Ave.; cost, $40,000.

F. J. Conrath, two-st'y store and dwell., 491 Milwaukee Ave.; cost, $4,000.

H. W. Jackson, three-st'y flats, 22 to 26 North Ada St.; cost, $10,000; architect, L. Berg.

Turner & Bond, 4 one-and-one-half-st'y cottages, Idaho St.; cost, $7,500.

S. Ridgley, three-st'y flats, 364 and 366 Leavitt St.; cost, $10,000; architect and builder, J. W. Cussel.

C. Rick, two-st'y dwell., 2744 Shields Ave.; cost, $2,500.

W. D. Kerfoot & Co., 5 one-and-one-half-st'y cottages, 102-122 Iowa St.; cost, $10,000.

Ph. Stemmiller, three-st'y dwell., 505 North Clark St.; cost, $11,000; architect, J. H. Huber; builder, L. Weick.

John Gillen, 3 one-st'y cottages, 3716-20-28 Butler St.; cost, $3,000.

Mrs. A. C. Allen, three-st'y dwell., 18 Walton St.; cost, $7,000; architect, W. L. B. Jenney; builder, R. E. McKay.

J. H. Lehner, three-st'y dwell., 779 North Clark St.; cost, $6,000; architects, Pentecost & Leimbach; builder, Wm. Hoeft.

J. Haase, four-st'y store and dwell., 1118 Milwaukee Ave.; cost, $9,000; architect, H. Clay.

C. W. Blaisdell, two-st'y dwell., 511 Lasalle Ave.; cost, $9,000; J. L. Halberg; builder, L. Martedsen.

C. E. Hoyer, three-st'y dwell., 307 Lincoln Ave.; cost, $4,500; architect, John Bruhns; builder, A. Hernowsky.

A. Hausske, four-st'y factory, 100-108 Weed St.; cost, $8,000; architect and builder, A. Hausske.

J. Krabower, three-st'y store and dwell., 644-646 Blue Island Avenue; cost, $13,000; architect and builder, J. Krabower.

Conrad Seipp, three-st'y store and dwell., Thirty-first St. and Cottage Grove Ave.; cost, $50,000; architects, Bauer & Hill; builder, G. Schneider.

F. Muehlke, 2 three-st'y dwells., Oak St.; cost, $6,000.

P. Nicholson, three-st'y flats, 345 West Adams St., cost, $7,500; architects, Furst & Rudolph; builders, Mueller & Scheel.

H. Copeland, two-st'y dwell., 597 West Harrison St.; cost, $4,000.

T. Goodjohn, three-st'y flats, 12 South May St.; cost, $6,000.

M. Holander, two-st'y flats, 201 North Carpenter St.; cost, $3,000.

N. Provost, two-st'y flats, 622 Taylor St.; cost, $5,000; architect, Wm. Thomas.

W. H. Maher, two-st'y flats, 618 Taylor St.; cost, $5,000; architect, Wm. Thomas; builders, Maher & Provost.

Spellman Bros., three-st'y factory, 91-101 Erie St., cost, $6,500; architect, Geo. S. Spohr.

A. McNally, two-st'y dwell., 346-348 North Park Ave.; cost, $18,000; architect, E. Baummann.

S. E. Gross & Co., 5 one-st'y cottages, Thomas St.; cost, $6,000.

W. Rosenthiel, two-st'y dwell., 309 Division St.; cost, $5,000.

H. S. Brown, three-st'y dwell., 84 Walton Pl.; cost, $3,000; builder, Wm. Hoeft & Co.

H. B. Foss, three-st'y flat and dwells., 459-469 West Monroe St.; cost, $60,000; architect, J. J. Flanders, builder, J. Mountain.

J. Richardson, three-st'y store and flat, 132 Hurlbert St.; cost, $5,500; architect, J. Brahms, builder, M. Cipplein.

B. D. & W. N. Eisendrath, four-st'y addition to factory, Dix St.; cost, $10,000; architects, Furst & Rudolph; builder, C. J. Muller.

J. Cochrane, two-st'y store-house, 3123 State St.; cost, $4,000.

C. Whidden, two-st'y dwell., 325 West Thirteenth St.; cost, $4,000.

J. Schumacher, two-st'y store and dwell., 470 Centre Ave.; cost, $4,000.

Wm. Myrick, two-st'y dwells., Groveland, Park Ave.; cost, $12,000; architects, Cobb & Frost.

C. Elherd, three-st'y flats, 97 Forquer St.; cost, $4,000.

J. Lomisky, three-st'y flats, 670 South Jefferson St.; cost, $4,200.

Cincinnati.

Houses. — Dr. H. A. Smith has let contracts for a four-st'y house on West Eighth St. Front of pressed-brick and cut-stone; cost about $14,000; S. E. Des Jardins, architect.

Plans have just been prepared by S. E. Des Jardins for a frame dwell. for F. G. Cross, Esq., to cost about $7,000; and for a brick house for Prof. H. T. Eddy, to cost about $8,000; both to be erected on Walnut Hills.

Grand Rapids, Mich.

Bank-Building. — Fourth National Bank Building, red-pressed brick and stone; cost, about $15,000; W. G. Robinson, architect, Grand Rapids.

Warehouses. — T. D. Gilbert, three-st'y brick warehouse; cost, about $25,000; W. G. Robinson, architect.

H. J. Hollister, three-st'y brick block; cost, about $25,000; W. G. Robinson, architect.

Houses. — S. A. Hart, brick dwell.; cost, $6,200; S. J. Osgood, architect, Grand Rapids.

Henry Walsh, wood dwell.; cost, $5,800; S. J. Osgood, architect.

F. B. Parmeter, wood dwell.; cost about $4,500; W. G. Robinson, architect.

L. F. Owen, wood dwell.; cost, $4,000.

Geo. Kortlander, wood dwell.; cost, $3,500.

H. Thum, wood dwell.; cost, $3,000.

E. W. Ford, wood dwell.; cost, $3,000.

Mrs. Sarah Sanderson, 2 wood dwells.; one cost, $3,000; one cost, $2,000.

W. N. Clark, wood dwell.; cost, $4,000.

D. S. Hopkins, architect for the above, Grand Rapids, Mich.

Stores. — Mr. Norris, block of three stores, three-st'y; cost, about $15,000; S. J. Osgood, architect, Grand Rapids.

New York.

Houses. — For R. H. Coburn, 3 three-st'y brown-stone houses, 16′ 8″ x 55′, are to be built on the s s of One Hundred and Twenty-ninth St., 150′ w of Seventh Ave., at a cost of $36,000, from designs of Messrs. Cleverdon & Putzel.

On the s s of Eighty-sixth St., between Madison and Park Aves., 2 houses, 18′ x 55′ and 20′ x 55′, are to be built, with brick, brown-stone and terra-cotta fronts, for Judge Pearson and daughter, at a cost of $42,000, from designs of Mr. Wm. Baker.

On the s s of Seventy-second St., 150′ e of Madison Ave., 2 four-st'y and basement brown-stone houses, 23′ x 78′ each, are to be built for Messrs. Joseph and Charles Liebmann, at a cost of $160,000, from designs of Mr. Alfred Tucker.

For Willard Parker, a four-st'y brick and brown-stone residence, 27′ x 80′, is to be built at No. 8 West Eighteenth St., to cost about $35,000, from designs of Prof. E. D. Lindsey.

Mr. Geo. C. Edgar will build, on the n s of Seventieth St., 100′ w of Ninth Ave., 4 four-st'y brown-stone houses, 18′ 9″ frontages, at a cost of about $60,000.

Mr. F. T. Camp has drawn plans for 2 four-st'y brown-stone houses, 22′ 6″ fronts, to be built for Mr. John Livingston, on the s s of Seventy-first St., 60′ w of Lexington Ave.

Stores. — On the s w cor. of Houston St. and the Bowery, 3 stores, 40′ frontage, are to be erected for Mr. Wm. Astor, from designs of Mr. H. C. de Band.

Apartment-Houses. — Two brick and brown-stone apartment-houses, 37′ 6″ x 90′, five stories high, are to be built by Bernard Spaulding, on the n s of Fiftieth St., between Madison and Park Aves., at a cost of $100,000, from designs of Mr. Geo. Ed. Harding.

For Mr. E. R. Fielding, 3 brick and stone apartment-houses, 22′ x 29′, 20′ x 59′ 6″, and 29′ 4″ x 66′ respectively, are to be built on the cor. of Second Ave. and Twenty-sixth St., from designs of Messrs. C. W. Romeyn & Co.

Building Permits. — *Greenwich St., Nos. 232 and 234*, five-st'y brick store and lofts, tin roof; cost, $20,000; owner, Laura V. Rhinelander, 6 West Thirty-second St.; architect, G. B. Post.

Eleventh Ave., s e cor. Thirty-eighth St., 4 five-st'y brick stores and tenements, tin roofs; cost, each, $15,000; owner, David Stevenson, Jr., 224 West Forty-sixth St.; architect, J. M. Forster.

Ludlow St., s w cor. Hester St., six-st'y brick tenement, tin roof; cost, $21,000; owner, H. Waters, 266 Bowery; architect, W. Graul.

Hester St., s s, 25′ w Ludlow St., six-st'y brick tenement, tin roof; cost, $11,000; owner, H. Waters, 266 Bowery; architect, W. Graul.

Madison St., No. 83, five-st'y brick store and tenement, tin roof; cost, $20,000; owner, Rosa White, 450 East One Hundred and Nineteenth St.; architect, J. M. Dunn; builders, Grissler & Fausel.

Great Jones St., No. 41, five-st'y brick store and tenement, tin roof; cost, $18,000; owner, Edward C. Fiedler, trustee, Eatontown, N. J.; architect, J. M. Dunn.

Seventh Ave., n e cor. One Hundred and Twenty-second St., 8 four-st'y brown-stone dwells., tin roofs; cost, corner, $25,000, and others, each, $18,500; owner, John W. Smith, 31 West One Hundred and Thirty-fourth St.; architect, Geo. B. Pelham.

Fourth Ave., n e cor. Ninety-first St., four-st'y brown-stone store and dwell., tin roof; cost, $15,000; owner, Susan Sullivan, 1365 Lexington Ave.; architect, J. Sullivan.

West Thirty-third St., No. 448, five-st'y brown-stone tenement, tin roof; cost, $10,000; owner, Jas. McDonald, 446 West Thirty-third St.; architects, N. Le Brun & Son; builder, D. Kenny.

Eighth Ave., n e cor. One Hundred and Twenty-ninth St., five-st'y brick tenement, tin roof; owner, Henry O'Neill, 322 West Fifty-seventh St.; architect, M. C. Merritt.

Eighth Ave., e s, 20′ n One Hundred and Twenty-ninth St., 4 five-st'y brick tenements, tin roofs; owner and architect, same as last.

Ninety-first St., n s, 87′ e Madison Ave., 3 three-st'y brown-stone dwells., tin roofs; cost, each, $13,000; owners, Emeline and Elizabeth Johnson, 443 and 445 East Eighty-fourth St.; architects, A. B. Ogden & Son.

First Ave., s e cor. Seventy-second St., 5 five-st'y brick tenements, tin roofs; cost, each, $18,000; owner, A. M. Treacy, 252 West One Hundred and Twenty-fourth St.; architect, R. Rosenstock; builder, T. Van Loon.

Tenth Ave., e s, extending from One Hundred and Twenty-eighth st. to One Hundred and Twenty-ninth St., iron and brick depot, with a two-st'y office-building; cost, $200,000; owners, Third Ave. Railroad Co., Third Ave. R. R. Depot; architect, P. F. Schoen; builder, I. A. Hopper.

Third Ave., s w cor. One Hundred and Seventh St., four-st'y brick store and tenement, tin roof; cost, $14,000; owner, Thomas McManus, 709 Lexington Ave.; architect, J. H. Valentine.

Third Ave., e s, 19′ 11″ s One Hundred and Seventh St., 3 two-st'y brick stores and tenements, tin roofs; cost, each, $6,000; owner and architect, same as last.

One Hundred and Thirty-sixth St., s s, 75′ w Sixth Ave., 3 two-st'y brown-stone dwells., tin roofs; cost, each, $11,000; owner, Robert G. Hargraves, One Hundred and Sixty-ninth St., cor. Mott Ave.; architect, J. H. Valentine.

Ave. A, s w cor. Seventy-fourth St., five-st'y brick tenement, tin roof; cost, $18,000; owner, Casper Protzmann, 769 Fourth Ave.; architects, Bettinger & Lange.

One Hundred and Fiftieth St., s s, 407′ w Third Ave., three-st'y frame tenement, tin roof; cost, $4,800; owner, John Henneberger, 683 East One Hundred and Fifty-second St.; architect, William Kusche.

West Twelfth St., Nos. 175 and 177, 2 five-st'y brick tenements, tin roofs; cost, each, $8,000; owner, John E. D. Develin, foot West One Hundred and Thirty-eighth St.; architect, C. F. Ridder, Jr.; builder, R. Hayes.

Lewis St., Nos. 179, 181 and 183, six-st'y brick factory, gravel roof; cost, $35,000; owner, Simon Strauss; 720 Fifth St.; architect, Ch as. Rentz, Jr.; builders, Peter Tostevin's Sons and F. A. Sieghardt.

Debrosses St., Nos. 4, 6, 8 and 10, 5 one-st'y brick buildings, tin roofs; total cost, $12,000; owner, S. V. R. Cruger, Comptroller of Trinity Church, 112 East Thirty-fifth St.; builder, L. H. Williams.

Fifty-second St., n s, 275′ w Sixth Ave., 3 three-st'y brick and brown-stone stables, tin roofs; cost, each, $10,000; owner, Robert McCafferty, 810 Fourth Ave.; architects and builders, McCafferty & Buckley.

East Seventy-sixth St., No. 400½, four-st'y brick dwell., three families, tin roof; cost, $9,600; owner, Henry Faltermann, First Ave., s e cor. Seventy-sixth St.; architect, Jobst Hoffmann.

Eighty-first St., n s, 231′ 6″ e First Ave., 4 five-st'y brick tenements, tin roofs; cost, total, $65,000; owner and builder, Matthias H. Schneider, 1455 Ave. A; architect, J. Kastner.

Fiftieth St., n s, 250′ e Madison Ave., 2 five-st'y brick flats, tin roofs; cost, each, $40,000; owner, Bernard Spaulding, 150 East Forty-sixth St.; architect, Geo. Ed. Harding.

One Hundred and Second St., s s, 135′ e Third Ave., five-st'y brown-stone front tenement, tin roof; cost, $12,000; owner, James Roache, 170 East One Hundred and Second St.; architects, A. B. Ogden & Son.

West Seventeenth St., Nos. 321 and 323, 2 five-st'y brick flats, tin roofs; cost, each, $28,000; owner, Geo. Shepherd, 322 West Twenty-second St.; architect, Jos. M. Dunn.

One Hundred and Fifty-fourth St., s s, 100′ w Elton Ave., three-st'y frame tenement, tin roof; cost, $4,500; owner, John G. Mueller, 684 East One Hundred and Fifty-fourth St.; architect, Wm. Kusche.

East Thirteenth St., No. 536, five-st'y brick tenement, tin roof; cost, $12,000; owner, Albert Stuhrmann, 513 East Thirteenth St.; builder, E. Sorensen.

Seventh Ave., s e cor. One Hundred and Twenty-sixth St., four-st'y brown-stone front tenement, tin roof; cost, $25,000; owner, Chas. Batcheler, 177 West One Hundred and Twenty-sixth St.; architect, M. V. B. Ferdon.

West Twenty-fourth St., Nos. 520 and 522, two-st'y brick factory, gravel roof cost, $6,000; owner, Sarah Myers, 421 West Twenty-second St.; architect, Geo. H. Budlong.

One Hundred and Sixty-eighth St., n w cor. Union Ave., three-st'y frame dwell. and one-and-one-half-st'y frame stable, tin roofs; cost, $3,300; owner, Hugo Bund, 2167 Third Ave.; architect, Henry Pierling.

Wall St., Nos. 71 and 73, part seven and part eight st'y brick and stone office-building, tile roof; cost, $290,000; owner, Eagle Fire Co., A. J. Clinton, President, 311 East One Hundred and Twenty-fifth St.; architect, G. E. Harney; builders, Marc Eidlitz and O. T. Mackey.

East Fourteenth St., Nos. 726-732, two-st'y brick factory, gravel roof; cost, $9,000; owners, Jacob and George Lorillard, 3 Mercer St.; architect, Henry Miller; builders, Wm. McKean and Henry Miller.

Eighty-second St., s s, 133′ 11″ w Ninth Ave., 5 four-st'y brown-stone dwells., tin roofs; cost, each, $15,000; owner, Samuel Colcord, 400 West Seventy-ninth St.; architect, H. L. Harris.

Philadelphia.

Redemptorist Home. — The corner-stone of the new Home of the Redemptorist Fathers, cor. Diamond and Hancock Sts., was laid May 11. The building is to cost $60,000.

Building Permits. — *Thirty-seventh St.*, cor. Chestnut St., three-st'y church, 60′ x 86′; three-st'y chapel, 40′ x 55′; and three-st'y parsonage, 30′ x 30′; W. D. Frismuth.

Eighth St., cor. Huntingdon St., 5 two-and-three-st'y dwells., 15′ x 42′; Jno. Loughran, contractor.

Rush St., s of Amber St., two-st'y dwell., 17′ x 46′; Chas. Hooback, owner.

Market Sq., Germantown, chapel, 52′ x 79′; Wm. Garvin, contractor.

Wayne St., n of Manheim St. (Germantown), 2 three-st'y dwells., 20′ x 60′; Wm. Garvin, contractor.

Orthodox St., above Frankford Ave., two-st'y dwell., 17′ x 24′; Chas. E. Deal, contractor.

Edgemont St., n of Somerset St., 3 two-st'y dwells., 18′ x 45′; Miller & Slater, contractors.

Twenty-seventh St., n of York St., three-st'y dwell. and 2 two-st'y dwells., 18′ x 40′; Wm. F. Albrecht, contractor.

Twenty-first St., cor. Fitzwater St., three-st'y brick building, 15′ x 46′; Thos. McCouch, contractor.

Sixty-first St., s of Baltimore Ave., two-st'y dwell., 14′ x 48′; Geo. Robinson, owner.

Jefferson St., e of Twenty-fifth St., 12 two-st'y dwells., and three-st'y store and dwell., 15′ x 40′; Jno. Sharp, owner.

Wright St., e of Twenty-fifth St., two-st'y dwell., 27′ x 35′; Jno. Sharp, owner.

Bailey St., above Oxford St., two-st'y stable, 18′ x 65′; J. S. Riley, owner.

Wharton St., cor. Tiernan St., Sunday-school building, 27′ x 70′; W. Thompson & Bro.

Evans St., between Price and Centre Sts., 2 three-st'y dwells., 16′ x 50′; Jas. Kuinaer Sons.

Reese St., above Somerset St., 2 two-st'y dwells., 17′ x 44′; W. Armstrong, owner.

Salmon St., between Ann and Neff Sts., two-st'y dwell., 16′ x 44′; Jacob Ziegler, contractor.

Twenty-eighth St., cor. Brown St., 10 three-st'y dwells., 15′ x 55′; Wm. H. Kembie, owner.

North Eighth St., No. 1606, three-st'y dwell., 18′ x 60′; M. McManes, contractor.

Forty-second St., cor. Hutton St., 8 three-st'y and 2 two-st'y dwells., 15′ x 44′; Chas. T. Hull, owner.

Pear St., w of Sixty-second St., two-st'y dwell., 16′ x 38′; Chas. Ristine, contractor.

Bolton St., below Ridge Ave., two-st'y dwell., 18′ x 3 ′; Chas. Lightcap, owner.

Fifth St., cor. Girard Ave., four-st'y warehouse, 30′ x 80′; Thos. McCarty, contractor.

Fortieth St., e s, n of Filbert St., 2 three-st'y houses, 18′ x 47′; Jno. A. Palmer, contractor.

Continued on page 3, Supplement.

The American Architect and Building News

ADVERTISERS' TRADE SUPPLEMENT.

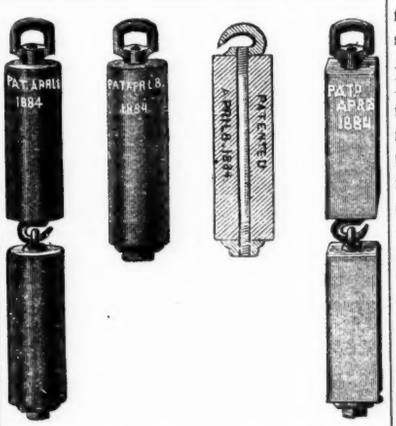
No. 24. SATURDAY, JUNE 7, 1884. Volume XV. No. 441.

AN ELEVATOR SAFETY-CATCH.

"Messrs. Clem & Morse, of Philadelphia, have recently put three elevators in the new Arcade Block on Hudson Avenue. One of these is supplied with the new improved pneumatic safety-catch, and two exhibitions were given yesterday to test its utility. The first exhibition occurred at 10 A. M., a number of prominent citizens, manufacturers and newspaper representatives being present, and the exhibitor, Mr. Wm. P. Gorges, explained the new appliance. The elevator platform proper is guided by ash strips three inches wide and extending the full depth of the well. The safety-catch is attached to the bottom of the platform, and consists of a half-inch poplar board resting on springs; any pressure on this sub-platform causes two steel shafts, the full width of the platform, to revolve. The shafts are furnished at either end with toothed eccentrics, which, the moment the shafts revolve, clutch the ash guiding-strips, and motion is almost immediately arrested. The appliance works automatically, by means of atmospheric resistance of the air beneath the elevator, caused by the accelerated speed incidental to a breakage of the cable. The elevator was raised about ten feet at the morning exhibition, and the cable separated at that distance.

"In the afternoon, at three o'clock, a representative of the *Express* was present, and saw several much more satisfactory tests. The reporter thought that the exhibition would be more interesting if the rope were cut at a greater elevation, and the exhibitor, Prof. Richard Prescott, E. E. Mack, Esq., and Mr. W. H. Paddock, placed themselves upon the elevator, which rapidly ascended to midway between the fourth and fifth stories, when Mr. Gorges mounted to the cross-piece, armed with a keen-edged hatchet. The voyagers held their breaths as the edge was applied to the rope; the rope separated and the elevator fell —one and three-fourths inches, and with scarcely a shock. The apparatus was lowered and the party ascended once more, and this time a very practical and unexpected test resulted; the rope accidentally parted of its own accord and the catch again worked to a charm. It occurred to the *Express* man that in the event of one being caught at the bottom of the well while the elevator was descending, he might prevent himself from being crushed to death by striking the safety-catch with his hands as soon as it came in reach. Mr. Gorges was glad to be afforded the opportunity of trying the experiment, and, accompanied by Mr. Paddock, he descended to the bottom of the well, while the elevator, under charge of Prof. Prescott, was rapidly lowered from the fourth story. The experiment was entirely successful, and the platform stopped just three inches above the gentlemen's heads. After a careful examination, we are at a loss to determine how any device could be more perfect and safe than the one exhibited." — *Albany Morning Express, April* 29, 1884.

COMPRESSED-LEAD SASH-WEIGHT.



The above cuts represent a newly-patented *compressed lead sash-weight*, which is manufactured exclusively by the undersigned.

These weights are made under hydraulic pressure, securing greater *solidity* and *density* of metal and a *smoothness* of finish not found in ordinary cast-lead weights.

They are about twice the weight of iron weights, and consequently occupy only about *one-half the space*, which is a great consideration in many cases where heavy plate-glass is used.

Compressed-lead weights have been made before now, and their advantages readily appreciated, but heretofore no satisfactory means has been devised for *fastening* them.

Through the centre of this weight runs a small wrought-iron rod, threaded at both ends, to which are securely attached malleable iron-knobs, hooks or nuts, as the case may require.

Every weight being "centre-balanced," they hang perfectly true and plumb, obviating all friction and noise.

The *linked weights* are very convenient for placing in and removing from pockets with *small openings*, and will be readily appreciated by the trade, the means of linking rendering them convenient for handling and shipping.

Any size or shape made to order on a few hours' notice. Prices no higher than ordinary cast-lead weights.

Freight allowed on all shipments to Eastern cities.

J. N. RAYMOND,
55 and 57 West Lake St., Chicago, Ill.

NEW PATTERNS IN LINCRUSTA-WALTON.

Lincrusta-Walton is being presented in many new designs by its American manufacturers. English selections are also copied. When Fr. Beck & Co., the manufacturers of fine wall-paper in Seventh Ave., purchased the sole agency of the new decorative material last August there were about thirty patterns. Now there are over 100 additional designs, and new ones are constantly being produced. The makers, owning the only factory in this country, are receiving orders for special designs for separate rooms in houses which are guaranteed not to be duplicated. The factory is at Stamford, Conn. There is one in France and one in England. Solidified oil enters largely into the composition of Lincrusta-Walton, and while the material is soft and allows the imitations of the most delicate outlines, as the raising of the ornament considerably above its ground, it hardens without becoming brittle, and is not affected by either water or temperature. The Crépe Pattern is used by artists as a ground for painting upon in oil and water colors. Panels representing statues in bronze are a novelty. Among the subjects now being wrought in Lincrusta is Bartholdi's statue, the panel and frame both to be of the new material. Some of the reliefs already produced closely resemble the wood-carvings of the old cathedrals.

Among the advantages of Lincrusta, one is that it can be used in its original colors, or painted while on the wall of a room in any shade adapted to the particular design of the furniture. Its sanitary qualities have been recommended by architects and sanitary engineers. It does not absorb moisture, and may be washed with soap and water without injury. Among the public rooms where Lincrusta has been used in decorating walls and ceilings are the dining-rooms at Delmonico's and the Hoffman House, offices in the new Produce Exchange building, and apartments in the Knickerbocker Flats in Fifth Avenue. Many dwellings have also been decorated with it.

Fr. Beck & Co.,
Seventh Ave., New York.

COPARTNERSHIP NOTICE.

New York, May 16, 1884.

The copartnership heretofore existing under the firm name of H. Edgar Hartwell & Co. has this day been dissolved by mutual

consent. H. Edgar Hartwell will continue to conduct the business, and will settle all claims outstanding in the firm's name.

H. EDGAR HARTWELL.
ELLIOT B. WHITING.

THE ATTWELL BURGLAR-PROOF SASH-LOCK.

Observe why the Atwell burglar-proof sash-lock and ventilator is superior to all others.

1. The locks are so located and constructed that it is impossible for the thief to control or force them.

2. Their power is not circumscribed, alone, to locking when the window is closed; but either sash, or both, may be securely locked at any desired point of elevation or depression.

3. One key, from one point (and that the most convenient), controls the two locks, and the key is removable at pleasure; thus the power to admit the air and safely lock against the thief is secured at one and the same time.

4. The locks are automatic in action — the sash always locked — and no labor of closing locks at night necessary, or a failure to leave them locked possible.

5. The bolt of either lock may be withdrawn, and held "shut off" when desired.

6. In high windows, the application of the "Attwell" extends a "sheltering care" over small children, and dispenses with the necessity of bars so frequently used. As the sash remains locked where left the child is unable to throw them up (on their weights), and, mayhap, topple out. With the window now, as the door, when the key is removed they become as securely locked from within as without.

7. When windows are without weights the application of these locks virtually dispenses with their necessity, giving the powers of three pieces of hardware in one, viz.: 1. The power of controlling and holding at points of depression the upper sash. 2. The power of holding at any desired point of elevation the lower sash, and providing such detent for the bolts as to render the accidental falling of either sash impossible. 3. A perfect sash-lock, locking at every point where sash is held, with removable key, locking automatically, and with malleable iron-bolts, so located and so strong that the thief cannot control or force them.

8. The location of these locks prevents their becoming deranged and getting out of order, or being themselves broken by battering against and bruising the wood at top of window.

Can the combined good points of all other sash-locks fellow this?

Is this not truly perfect?

READ WHAT THE ARCHITECTS, BUILDERS AND USERS SAY.

ZANESVILLE, O., April 24, 1884.

ATTWELL MANUFACTURING CO.:—

Gentlemen,—I take pleasure in endorsing fully all that you claim for your burglar-proof sash-lock and ventilator, and consider it a great acquisition to the builders' trade, and anticipate a large demand and sale for them. I am so well satisfied with it that I shall specify it in the future.

I am, gentlemen, very truly, etc.,
HENRY C. LINDSAY, Architect.

ELMIRA, N. Y., April 12, 1884.

ATTWELL MANUFACTURING CO.:—

I have received your circulars, etc. I am much pleased with the invention, and am satisfied they are the best for the purpose intended of any in the market. I have some buildings in course of construction that I shall use them upon.

Very truly, etc., E. B. GREGORY.

MEMPHIS, TENN., April 12, 1884.

ATTWELL MANUFACTURING CO.:—

We have examined the Attwell burglar-proof sash-lock and ventilator, *and find it all the inventor claims for it.* We cheerfully recommend it as a safe fastening. Our purpose is to use it in our specification in the future. Truly, etc.,
COOK & BURKE, Architects.

I fully endorse the above.
C. G. ROSENPLAENTER,
Architect and Engineer.
T. FRIEDLANDER,
Architect.

CRAWFORDSVILLE, IND., April 17, 1884.

ATTWELL MANUFACTURING CO.:—

I am using the Attwell burglar-proof sash-lock and ventilator, and am most thoroughly satisfied with it. I can ventilate with safety, and it is so convenient. I would not for $5.00 spare it from a window in my house. Respectfully, etc.,
W. W. SEAWRIGHT,
of WM. SEAWRIGHT & CO.

SEYMOUR, IND., April 10, 1884.

ATTWELL MANUFACTURING CO.:—

I regard the Attwell burglar-proof sash-lock and ventilator as far superior to anything I have ever seen in the shape of a sash-lock, and most heartily commend them to my patrons. Truly, etc.,
J. BALSLEY, Architect.

LAFAYETTE, IND., April 11, 1884.

ATTWELL MANUFACTURING CO.:—

Your sash-lock is the best of all to my knowledge. It does everything that sash requires. It is easily applied, and does not mar the window in application.
I. W. McCLAIN,
Architect and Builder.

COLUMBUS, IND., April 13, 1884.

ATTWELL MANUFACTURING CO.:—

Having thoroughly examined your sash-lock I find them the best for any kind of window.
O. SPARRELL, Architect.

CRAWFORDSVILLE, IND., April 17, 1884.

ATTWELL MANUFACTURING CO.:—

Your burglar-proof sash-lock and ventilator is destined to become the standard sash-lock. It is the best ever produced. We recommend the lock, and will use them altogether in our business.
KELLAR & BROCKERSON, Builders, and Manufacturers of sash, doors and blinds.

COLUMBUS, IND., April 20, 1884.

ATTWELL MANUFACTURING CO.:—

I have examined the Attwell burglar-proof sash-lock and ventilator, and have no hesitation in saying it is the best device for locking and controlling sash I have ever seen, and do most cheerfully recommend it. Truly. etc.,
JAS. W. PERKINSON, Architect.

MEMPHIS, TENN., April 10, 1884.

ATTWELL MANUFACTURING CO.:—

I have examined the Attwell burglar-proof sash-lock and ventilator, and I pronounce it the best I ever saw. The principle is new, and the lock cannot be excelled.
GEO. H. KYLE, Architect.

NASHVILLE, TENN., April 9, 1884.

ATTWELL MANUFACTURING CO.:—

I have examined the Attwell sash-lock and ventilator, and believe it to be the very best device among the many hundreds I have seen for the purpose for which it is intended.
W. S. MATHEWS, Architect.

NASHVILLE, TENN., April 9, 1884.

ATTWELL MANUFACTURING CO.:—

I think yours the best sash-lock I have ever seen. It meets every demand, and could not be improved upon. Truly. etc.,
P. R. BRISBY, Architect and Builder.

BUFFALO, N. Y., April 16, 1884.

ATTWELL MANUFACTURING CO.:—

Your sash-lock is by far the best arrangement for sash I have ever seen used. I shall commend them to my patrons. Yours, etc.,
E. HENRI KELLY, Architect.

GALVESTON, TEX., April 11, 1884.

ATTWELL MANUFACTURING CO.:—

I have examined the Attwell burglar-proof sash-lock and ventilator, and I unhesitatingly pronounce it the best thing for the purpose intended I have ever seen. It is practical in every detail, and easily applied. Truly, etc.,
J. LEE BURTON, Contractor and Builder.

ANN ARBOR, MICH., April 24, 1884.

ATTWELL MANUFACTURING CO.:—

I received the locks I ordered, and they work well and give perfect satisfaction. I have called the attention of Messrs. Schuh & Muchlig dealers in hardware) to them, and you will in a few days receive a large order from them.

Truly yours,
GEORGE SCOTT, Contractor and Builder.

For circulars and price-lists, address
ATTWELL MANUFACTURING CO.,
357 RACE ST., CINCINNATI, O.

THE BEST BUILDING PAPER, SACKETT'S SHEATHING.

As the advantages of Building Paper under weather-boards, slate, tin, shingles, floors, etc., is sufficiently understood, it is merely a question of which kind best suits the purpose. Tarred sheathing, still preferred by many because it is moisture and vermin-proof, owing to its strong smell, and being unclean to handle, was largely superseded by rosin-sized and straw board, neither of which are vermin-proof or impervious to moisture, water, and gases. *Sackett's Sheathing* consists of two sheets of paper cemented together by an intervening layer of water-proof composition, is strong, clean to handle, inexpensive, vermin-proof, and *impervious to moisture, water, and gases*, combining all the advantages of tarred, rosin-sized, and other sheathings, without any of their disadvantages, is 36 inches wide, and put up in rolls of 1,000 square feet each. Send for samples to

NEW YORK COAL-TAR CHEMICAL CO.,
10 WARREN STREET, NEW YORK.

INSULATED AIR-COVERINGS FOR STEAM-PIPES.

CHICAGO, May 6, 1884.

EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—We enclose herewith a copy of a letter received from the J. I. Case Plow Company, which please insert in whole or in part in the local columns of the next issue of your journal, and oblige, Yours truly,
SHIELDS & BROWN.

RACINE, WIS., April 30, 1884.

MESSRS. SHIELDS & BROWN, Chicago, Ill.:—

Gentlemen,—Yours of the 26th inst., asking our opinion of your pipe-covering was referred to me, and in reply would say that we have been using your insulated air-covering for some time, and find it superior to any other I have had any experience with.

Before placing our order for covering, I had samples of several different kinds on trial, and found yours the best. I have this day taken off a section of the first covering we put on, and find no sign of charring, while the temperature of the outside is but slightly above the temperature of the room.

Before our steam domes were covered, the steam in our boilers would go down to zero in from four to five hours after stopping at night, but since we have applied the insulated air-coverings we have from thirty-five to forty-five pounds of steam at six o'clock in the morning, twelve hours after stopping, which fact alone shows the great saving in fuel.

The covering is easily applied, and neat in appearance.

You are at perfect liberty to refer to us, and will be pleased to show our covering to any parties you may send here.

Very truly yours,
J. F. FOSTER,
CHIEF ENGINEER OF THE J. I. CASE PLOW CO.

ASBESTOS AND ITS USES.

This mineral has, through the efforts of manufacturers, become one of the leading specialties of the business of this country.

Sixteen years ago it was, to all intents and purposes, unknown, except to a few scientists and practical chemists.

Scientifically, asbestos is described as a mineral fibre, composed of silicate of magnesia, silicate of lime and protoxide of iron and manganese. The finer fibres are of a soft, oily, or silky nature, capable of being spun, twisted and woven, while the coarser are harsh, inflexible and brittle.

The incombustibility of asbestos is its principal characteristic, and manufacturers and inventors are turning their attention to its uses in the production of fabrics to be used solely for their fire-proof qualities. It is capable of receiving and retaining the most brilliant colors, is a non-conductor of heat and electricity, and possesses many other valuable and practical qualities.

In 1868, Mr. H. W. Johns first made known the results of his experiments with the mineral, and having proved its value in the manufacture of materials for mechanical purposes, the company of which he is president

is now producing them on a large and extensive scale.

Among the most important are rope and wick packing, for packing pistons, stuffing-boxes, valve-stems, etc., flat packing or millboard for cylinder heads, flange joints and similar purposes, sheathing and building felts, all of strictly pure asbestos.

The asbestos and India-rubber sheeting tape and gaskets for hot water and steam joints, are comparatively new articles of manufacture, also asbestos cloth of various widths, thicknesses and weights, and asbestos thread, yarn, twine and cloth.

The asbestos roofing manufactured by this company is well and favorably known, and its reputation fully established. As a light, portable, easily applied, practically fire-proof roofing, it has no superior. Of this article the company are manufacturing from *two to three miles per day*, and find a ready sale for it.

In 1874, Mr. Johns commenced the manufacture of liquid paints on a more extended scale. These paints are composed exclusively of the best and purest materials, combined on different principles from any other liquid or mixed paints. The purest linseed oil and best pigments enter into their composition.

To assist consumers in selecting shades and colors for the satisfactory decoration of their buildings, the company issue and send free, upon application, sample sheets showing forty-eight standard colors and tints; they also issue a pamphlet on "structural decorations," giving hints and suggestions in painting and decorating, in which they bring the different colors together—body, trimming and blinds—so that it is an easy matter for the consumer to decide what colors will best please him. This pamphlet also contains views of many of the prominent public buildings and other structures on which these paints have been used, and the colors employed—among them, the United States Capitol at Washington, the Metropolitan Elevated Railroad and the "Dakota," at Seventy-second street and Eighth avenue.

In addition, the company also manufacture roof, car and bridge paints in seven colors.

Recently the company have begun the manufacture of strictly pure colors in oil, and are meeting with a ready demand for their goods.

H. W. JOHNS MFG. CO.,
87 MAIDEN LANE, NEW YORK.

NOTES.

MESSRS. N. & G. TAYLOR CO., of Philadelphia, say that architects now appear to be realizing the importance of using first-class material on first-class buildings, and that their numerous circulars and letters to the building trade are evidently having a most beneficial effect, as contractors, architects, and builders are writing them from all over the country, especially for information in regard to the "genuine old style" re-dipped or double-coated roofing tin. For the past ten years, the quality of roofing plates has been getting gradually poorer and poorer, and many of the old brands that at one time could be relied upon, have caused frequent complaints on account of their now inferior coating, and poor quality of iron. This is on account of the patent roll system by which all the metal that would adhere to the iron is squeezed off by passing through rolls that revolve at the top of the melting-pot, and through which the sheet must pass. Consumers, therefore, get the appearance in the plate, but the plate itself is not what it should be. This deterioration in quality caused them, some years ago, to have a roofing-tin made, both of the finest quality of iron and coating, in the old-fashioned way, whereby each sheet is dipped separately by hand in a pot of metal, and then placed on a rack to cool. In this way the sheet is dipped twice, and contains all the metal possible; hence the name "double-dipped." They have branded this plate "Taylor's Genuine Old Style," re-dipped or double-coated, and to guard against imitations and counterfeits, have caused to be registered as a trade-mark the target and arrow which consumers will find on every box. They guarantee every sheet of this to be of best charcoal-bloom iron, covered with all the metal it will hold.

MESSRS. J. B. & J. M. Cornell say that the report that they have discharged some of their men until they joined their trade-union is not correct. They have discharged no men for this reason, nor have they discharged any of the men working on the Mutual Life Insurance Company's new building.

THE NOVELTY PORTABLE HOT-AIR FURNACE.

BALTIMORE, MD., April 25, 1884.

MESSRS. GEO. F. HUEBECK & SONS:—

Gentlemen,—The No. 48 Novelty Furnace in the St. Marks P. E. Church has worked splendidly during the past winter, making it perfectly comfortable in the severe weather without forcing. Our church is 44′ x 70′ long, the side wall being 20′ high, while the ceiling in the centre is 45′ high. The chancel extends back 11′ and is 22′ wide, the side walls of which are 16′ and the centre 25′ high. The organ-loft extends over the vestibule (which is not heated), and is 8′ deep and runs across the whole end of the church and is 30′ high in the arch. It receives no assistance, except that after Sunday-school in the afternoon the surplus heat from the chapel is turned on, and at the evening service we are compelled to open the windows in the roof. We have burned nine tons of coal so far this year, and think twelve tons sufficient for the longest and coldest winter we are likely to have. Fire is usually started on Saturday, and the furnace has never yet been used to its full capacity. We consider this quite a test, and you can make what use of the information you like. The vestry and congregation, together with myself, thoroughly appreciate the furnace for the comfort it has given us. Respectfully,

E. L. KEMP, RECTOR.

Having had a considerable zero weather in the above city during the past winter, the testimonial will convey some idea of the enormous power of our furnace, and also of the economy of its consumption of fuel in comparison with other apparatus performing the same work. The simple management and perfect operation of the Novelty makes it unsurpassed for private dwellings, and we advertise it in this paper to get it before the architects and builders, from whom we solicit an investigation of its merit and superior adaptability to all sorts of buildings and circumstances, that they may be able to recommend it in cases where a first-class article is desired, from which there will be no trouble of taking down every year to clean the drums, they being perfectly self-cleansing, and so placed that they are never burned out, and yet are subjected to a heat that prevents the accumulation of soot to retain acid and absorb moisture to rust them out in summer.

We can actually count on our fingers all the furnaces that ever had new drums out of over 10,000 in use. The arrangement of these drums is such that all points are equally distant from the fire, and the passage of the ignited gases through them heats every portion to practically an even temperature, and being upright and close to each other they thoroughly warm the air on its natural upward passage through the furnace, which is made rapid by their intense heat, thus creating a constant flow of a large volume of pure warm air to take the place of that fouled by breathing, and otherwise allowing free ventilation; in fact, the abundance of the heated air frequently forces better ventilation by making the almost hermetically sealed apartments of some patrons uncomfortably warm. Every appurtenance necessary for convenience and durability is provided; a perfect dust-flue, connecting immediately with the direct draft-flue effectually disposes of all dust that rises in cleaning the fire, while the sand-joints are a character of connection that is entirely proof against the escape of any gas, smoke or dust to vitiate the air, and also allows each of the parts connected to expand or contract independently in any direction without any detrimental influence on the other. It has an anti-clinker grate that enables a fire to be kept up indefinitely with either good or bad coal. A vapor-pan is located where evaporation is sure. An unequalled check-draft at the back places the furnace under perfect control, either for consumption of fuel or heating capacity. It is well adapted to the use of soft coal, being quite largely used in that section of Pennsylvania and Maryland.

We trust this will attract the careful attention and consideration of the many subscribers of this valuable journal.

Very respectfully,
ABRAM COX STOVE CO.

BUILDING INTELLIGENCE.

Philadelphia. (*Continued.*)

Front St., above Harrison St., two-st'y factory, 30′ x 110′; Thos. A. Lynch, contractor.

Montgomery Ave., between Tulip and Memphis Sts., 4 two-st'y dwells., 16′ x 38′; Eldridge & Stewart, contractors.

York St., cor. Jasper St., one-st'y dye-house, 28′ x 55′; Eldridge & Stewart, contractors.

St. Louis.

BUILDING PERMITS.—Nineteen permits, all brick, have been issued since our last report. Those worth $2,500 and over are as follows:—

H. Suedhoelter, dwell.; cost, $3,000; contractor, H. Suedhoelter.

J. H. Schrader, dwell.; cost, $4,000; architect, B. J. Goesse; contractors, Goesse & Remmers.

John Dwyer, dwell.; cost, $4,000; architect, Wm. S. James.

John Horan, dwell.; cost, $6,000; architect, T. Gugerty; contractor, T. Gugerty.

James C. Burg, Jr., two-st'y dwell.; cost, $4,000; architect, T. Gugerty; contractor, T. Gugerty.

J. W. Hanerty, two-st'y dwell.; cost, $2,500; architect, T. Gugerty; contractor, T. Gugerty.

Theodore Rick, two-st'y alteration; cost, $3,000; architect, W. Gaines; contractor; T. W. Loffhagen.

Thomas Brennan, two-st'y tenement house; cost, $4,000; contractor, T. Brennan.

C. F. Tuirbend, two-st'y mansard; cost, $4,000; contractor, T. Brennan.

C. T. Tuirbend, brick dwell.; cost, $4,000; architect, C. F. May; contractor, Louis Streiker.

People R. W. Co., feed store; cost, $4,000; contractor, W. Cochran.

E. Gallagher, 2 adjoining brick dwells.; cost, $3,000; architect and contractor, W. S. O'Brien.

Thomas O'Reilley, brick warehouse, cost, $25,000; architect, J. H. McNamara; sublet.

Trinity Episcopal Church; cost, $10,000; architect, Kias Tully; sublet.

Anton Michel, brick dwell.; cost, $4,000; architect, C. Merner; contractor, H. Ellermann.

F. E. Millersberger, brick dwell.; cost, $3,000; architect and contractor H. Ellermann.

Dominick Weget, 8 adjacent tenements; cost, $4,000; architect, Otto Koenig; contractor, Frank Herman.

Julius Goetz, dwell.; cost, $3,000; architect and contractor, A. Ellermann.

J. H. Pohman, dwell.; cost, $5,600; architect, A. Beimke; contractor, P. Tiernan.

G. Momahan, 6 adjoining dwells.; cost, $13,540 architect, S. J. Simmas; contractor, Alex. McAllister.

PROPOSALS.

IRON-WORK.

[At Peoria, Ill.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., May 31, 1884.

Sealed proposals will be received at this office until 2 P. M., on the 23d day of June, 1884, for furnishing and putting in place, complete, the iron beams and columns required for the Post-Office, Court-House, etc., building at Peoria, Ill., in accordance with drawings and specification which, with any additional information may be obtained at this office, or the office of the local Superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
442 Supervising Architect

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