to the public that the contractor for cleaning the streets is not made to use the water more freely. It is an aggravation of this evil that, failing to have it used by their own agents, the authorities will not grant the privilege to those citizens who are willing to undertake, at their own cost, to have a work performed which the town scavenger can not or will not do. It is known that particular streets, or portions of streets, in which there is a large amount of travel and business done, are now being swept regularly by men employed for the purpose by those having their stores and dwellings on the thoroughfares. In order to keep the dust from rising during the process, and to assist the operation of removing the dirt, it is indis pensable to have some means of irrigation. The Watering Committee were accordingly applied to, and solicited to allow the hydrants to be opened for that object; but they flatly refused the request, under a magisterial threat that a penalty of five dollars would be enforced for every plug that the applicants might dare to touch! What possible excuse, we should like to know, can be urged in vindication of this miserable dog-in-the manger policy? Nothing could warrant it except a necessary economy of the aquatic resources of the corporation. 26-1

Let us see, then, of what supply the Fairmount Works are capable. Taking the Report of the Watering Committee for 1853, we find that there are, in all, five reservoirs, the total contents of which exceed thirty-eight and a half millions of ale gallons. The average quantity of water consumed during 1853, exceeded very slightly six millions of ale gallons per day. Hence, it follows that, so far as reservoir space is concerned, the capability of supply is more than five times as great as the actual consumption. In other words, the basins at Fairmount are able to hold thirty odd millions of ale gallons of water over and above the amount required by the present demand for the use of the water tenants. So that, making all due allowance for the water that must be kept standing for the deposit of impurities before it is drawn off, and also for such accidents as may occasionally interrupt the operation of the works, it seems obvious that there is ample capacity in the cisterns now built to admit of a very profuse employment of the water for street ablutions. It is possible, however, that the working power of the pumps and ascending mains is not sufficient to furnish daily a quantity of water nearly equal to that which the reservoirs will contain. Should the fact be as supposed, then it constitutes a defect which should be remedied as speedily as practicable, if for no other reason than to provide for the exigency of which we are speaking. This could be accomplished by simply substituting turbine wheels for the breast wheels now in use. The rising of the tide above the lower edges of the breast-wheels has stopped their operation from four to six hours per day. They all work under one foot head and seven feet six inches fall, when the dam is just full and the tide low. The turbine wheel, erected in 1851, is seven feet in diameter, having a bucket ten inches deep and about thirteen inches wide. It transmits its motion to a force pump of sixteen inches diameter, with a six feet stroke, driving it at a speed of twelve revolutions per minute. The wheel works under a head and fall of six feet and six inches at high tide and ten feet at low tide. It has been worked without disadvantage during several freshets in the river, and may be operated twenty-four hours daily. The superintendent of the works, speaking of the turbine wheel in a late report, says: "The perfect success of this wheel affords the means of increasing the power of the works at Fairmount, by substituting turbines for the breast-wheels now in use, to the extent of from four and a half to six millions of gallons per day;" an increase, it will be observed, which would nearly double the average daily supply of water in 1853.

We think it is clear that there is not now any such deficiency of water as would justify preventing its use freely in cleansing the streets of the city. If, however, we should be wrong in this belief, then there is an easy mode of enlarging the supply, and the improvement should be made at once. In the meanwhile Councils should compel the City contractor to turn on the water in the gutters two or three times a week, or authorize the use of it for that purpose by the scavenger in the pay of the citizens. Public comfort and health imperatively require that one of these alternatives shall be adopted, and we hope to see some action taken in the matter immediately.

"Your Committee cannot speak in terms which would be too laudatory of the Fire Department of that city—it is, indeed, the most admirably arranged and conducted they have ever had the pleasure of examining, and is in every respect what it should be—possessed of an admirably situated Alarm Bell—in fourteen minutes the entire Department (consisting of a Steam Fire Engine and thirteen hand Engines, situated in different parts of the city,) were upon the ground indicated by the bell. The Chief Engineer had the fire in the Steam Engine lighted, and in seven minutes she threw water." 1/7 time 26-2

"The Engine may be briefly described thus:—It is a double acting engine with two nine inch cylinders, working two six inch pumps, two feet stroke—making about ten revolutions to the minute. The two hind wheels of the engine (while the apparatus is stationary) acting as fly wheels to the hind axle, being made fast to the wheels by a "sleeve coupling" in the centre, assists in propelling the apparatus when in progress to and from a fire. The boiler is a vertical furnace with a "worm tube" inside, *the water being in the tube* and the fire passing round it. A "doctor" is used to supply the engine with water—there is also an air pump to form a vacuum in the boiler, (by means of which steam is of course much more rapidly generated,) which is worked by two men from the instant the fire is started until the steam operates on the "doctor." In front of the engine is a large tank, containing a sufficient supply of water for the 'doctor,' by means of which the engine can be worked until the suctions are attached. On each side of the tank is a column, ten inches by about four and a half feet in length, used as air chambers, which are connected at the bottom by a semi-circular four inch pipe (around the tank) with six outlets or openings to make attachments—below, by means of a different pipe, are two large openings for larger attachments. Thus the engine is enabled to throw *six three-quarter inch streams*, or two one and a quarter inch streams, or one two inch stream to almost any required distance. The general appearance of the engine can be best understood from the lithograph representation herewith attached, which is exceedingly accurate. It is that of a large locomotive—its weight is four tons—it rests upon three wheels, and can be readily drawn by four horses. This engine is much superior to the original one, and is yet susceptible of improvement. In speaking of the operations of the engine, your Committee only state what *they saw*, and are entirely satisfied that if necessity had required it, water could have been thrown much more speedily. With regard to the entire success of the steam engine, your Committee beg to quote from the Report of the Chief Engineer of the Cincinnati Fire Department for the year ending April 1sst, 1854. In speaking of the old apparatus, or 'Steam Engine No. 1,' and the one now known as the 'Citizen's Gift,' he says:

"'The present steam engine has been in the service of the Fire Department for over sixteen months, and if any doubt remained at the date of my last report of the practicability of this invention for protecting property from destruction by fire, it must now be removed. The triumphant success of this invention has so completely satisfied every one that has seen it in operation, not only as a means of greater security to property, but in point of economy far beyond anything now in use. This has been so manifest that I have been enabled, through the liberality of some of our citizens and Insurance Companies, to raise a sufficient sum to pay for another new steam engine, which has just been finished, and now in the service of the city. The one authorized to be contracted for by your body, the Chairman of the Committee on Fire Department and myself thought proper to defer contracting for, until the one recently built was finished and tested, desiring to see it in use, so that if any improvements were to be made, we could avail ourselves of them in the construction of the new one authorized to be built by a resolution of your body,' from which it appears that the authorities and people of that city are so fully satisfied of the usefulness and economy of the steam fire engine, that they will soon be possessed of three of said engines."

The Philadelphia Water Works Ornamental Pipe. 26-3

Our readers will remember the illustration of the ornamental stand pipe of the West Philadelphia Water Works, which was published on page 61 SCIENTIFIC AMERICAN, and stated to be designed by Wm. H. Howson, of Camden, N, J. We have received a letter from Messrs. Birkinbine & Trotter, Engineers and Contractors of said Water Works, in which they state that Mr. Howson did not design the stand pipe, but that it was designed and erected by them, Mr. Howson being in their employ as draughtsman for a portion of the time the works were in the progress of erection. We would state that we have read affidavits certifying that Mr. Howson was the designer of the ornamental stand pipe in question, and that such evidence was, and is still satisfactory to us, respecting the author of the design in dispute.

LOCAL AFFAIRS.

The Old Independence Bell.—The old bell which first proclaimed liberty to the United Colonies from the State House steeple, and which for years past has been an object of attraction in Independence Hall, now occupies a position in the hall immediately in front of the portrait of Lafayette, close by the statue of Washington, on a pedestal designed for the purpose by Frederick Graff, Esq. The pedestal is octagonal in shape with a double base. Upon the base are placed, at the corners, eight fasces surmounted by the liberty cap and other emblems, and upon the fillets which bind the reeds of these fasces, are tastefully arranged the names of the Signers of the Declaration of Independence, indicative of the effect of that act in binding the Union together. Upon the fasces are shields—one containing the coat of arms of the United States; a second, the arms of the State of Pennsylvania; a third, the arms of the city of Philadelphia; and the fourth, the following:—"The ringing of this bell first announced to the citizens who were anxiously waiting the result of the deliberations of Congress, (which were at that time held with closed doors) that the Declaration of Independence had been decided upon; and then it was that the bell proclaimed liberty throughout the land to all the inhabitants thereof!" The American flag is gracefully festooned between the fasces, and binds them by its ample folds. The carving was executed by a young man in this city named T. Daily. The bell is surmounted by a large gilt eagle. The pedestal is painted with white China gloss, with the coats of arms, names of signers, and inscription on the shields in gilt.

The subjoined history of the bell may not prove uninteresting. The copies of the annexed letters, addressed to Robert Charles, of London, in 1751 and 1753, by Isaac Norris and others, on the subject, explain themselves, and from which it will be seen that the inscription on the bell was ordered to be cast twenty five years before the Declaration was signed:—

November 1, 1751.

Respected Friend Robert Charles:—The Assembly having ordered us (the Superintendents of the State House) to procure a bell from England, to be purchased for their use, we take the liberty to apply ourselves to thee to get us a good bell of about two thousand pounds weight, the cost of which we presume may amount to about one hundred pounds sterling, or perhaps with the charges something more, and accordingly we have enclosed a first bill of exchange by John Porsins & Son on Messrs. Thomas Flowerden & Co for £100 sterling. We would have chosen to remit a larger bill at this time, but will take care to furnish more as soon as we can be informed how much may be wanted. 26-4

We hope and rely on thy care and assistance in this affair, and that thou wilt procure and forward it by the first good opportunity, as our workmen inform us it will be much less trouble to hang the bell before the scaffolds are struck from the building where we intend to place it, which will not be done till the end of next summer or beginning of the fall. Let the bell be cast by the best workmen, and examined carefully before it is shipped, with the following words, well shaped, in large letters around it, viz.: 'By order of the Assembly of the Province of Pennsylvania for the State House in the City of Philadelphia, 1753,' and underneath "Proclaim Liberty through all the land to all the inhabitants thereof." Levit. xxv. 10.

As we have experienced thy readiness to serve this Province on all occasions, we desire it may be our excuse for this additional trouble from, Thy assured friends, Isaac Norris, Thos. Leech, Edward Warner.

March 10, 1753.

In a previous letter I gave information that our bell was generally liked and approved of, but in a few days after my writing I had the mortification to hear that it was cracked by a stroke of the clapper without any other violence, as it was hung up to try the sound; though this was not very agreeable to us we concluded to send it back by Capt. Budden, but he could not take it on board; upon which, two ingenious workmen undertook to cast it here, and I am just informed that they have this day opened the mould, and have got a good bell, which, I confess, pleases me much that we should first venture upon and succeed in the greatest bell cast, for aught I know, in English America. The mould was finished in a very masterly manner, and the letters, I am told, are better than in the old one. When we broke up the metal, our judges here generally agreed it was too high and brittle, and cast several little bells of it to try the sound, and fixed upon a mixture of an ounce and a half of copper to one pound of the old bell, and in this proportion we now have it.

April 14, 1753.

A native of the Isle of Malta, and a son of Chas. Stow, were the persons who undertook to cast our bell. They made the mould in a masterly manner, and run the metal well, but upon trial, it seems they have added too much copper in the present bell, which is now hung up in its place. But they were so teazed with the witticisms of the town, that they had a new mould in great forwardness before Mear.ard's arrival, and will very soon be ready to make a second essay. If this should fail, we will embrace Lister's offer and send the unfortunate bell again to him by the first opportunity. 26-5

In the Pennsylvania Packet of June 7, 1753, the following notice appeared. 'Last week was raised and fixed in the State House steeple, the new great bell, cast here by Pass & Stow, weighing 2080 pounds, with this motto:—'Proc.aim Liberty through all the land to all the inhabitants thereof.'"

From the above it will be perceived that the bell now in the Hall, is the one which announced the adoption of the Declaration of Independence, and the first bell of any magnitude cast on this continent. It was cast by Pass & Stow, whose names appear on it, and is composed, in part, of the original bell ordered by Mr. Norris. In 1777 this bell, with those of Christ Church and others, were removed from the city and buried in the Delaware river, opposite Trenton, in order to prevent their destruction by the British army, which at that period, occupied the city.