

Improved Flush-Tank.

In these times when so much well-founded fear exists in regard to the injurious consequences that may be created by escaping sewer-gases, undermining the health of the inmates of even the best of houses, we think it our duty to call attention to an improved flush-tank, the invention of a leading English sanitary engineer, Mr. Rogers Field, whose device is free from the objections made to the common tanks, and besides constitutes an improved element of sewage and house drainage.

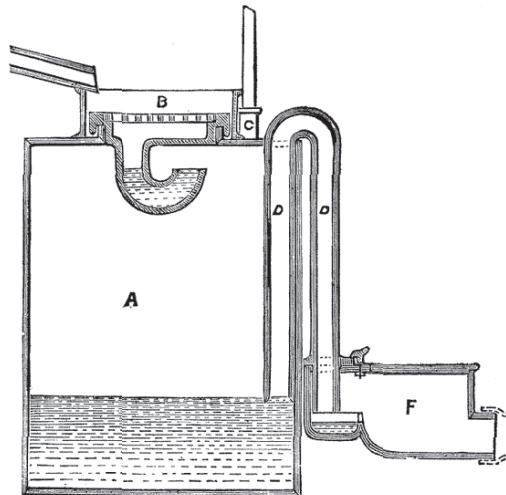
The essential feature of this tank is a syphon which comes into action automatically when the vessel to which it is attached is filled to a certain height, and which ceases its action when the vessel is emptied. The rest of the apparatus may vary considerably, as well in form as in detail, according to the circumstances under which it is to be applied. The adjoined figure gives a vertical section of one of these arrangements when applied for drainage where it is desirable to have an automatic periodical discharge of the accumulating contents of a receptacle of impure liquids, so as to prevent the mass from standing long and accumulating in the sink. B is a grate over a sieved trap, which prevents large objects from reaching the trap and, perhaps stopping it up, while the curved trap forms a hydraulic seal, preventing the odor from the receptacle A passing freely out of the same. D D is the syphon spoken of; it is evident that as soon as the receptacle A has become filled, and the liquid, after first reaching the curved trap, immersing it entirely, and has reached the grate B, it has also reached the top of the syphon D D, which then at once commences to operate, and keeps in operation until the liquid has been emptied so far as the syphon dips into the same, when it will stop; this syphon, therefore, forms a periodical and copious flow, which empties through F into the sewer, and constitutes a much more effective periodical washing out by a copious stream than is the case when a mere overflow empties every small quantity of liquid which is added, while then the receptacle is full, retains all sediment accumulating there, and at last becomes so filled as to necessitate from time to time the unwholesome labor of emptying the same. When the syphon goes down nearer to the bottom, and F is lower than is represented in the drawing, it will also empty further down than represented.

This system may be applied to the flushing of drains or sewers by the accumulation of a small constant supply of extraneous water, or by retaining the drainage matter itself and shooting it rapidly out for flushing purposes. It will work with an intermittent supply of any amount, or with a constant stream of the slightest volume. It has no moving parts—nothing to be worn by friction or choked by accumulations. It will work with any difference of elevation, from 12 inches to any height that is met with in practice. A syphon capable of discharging a barrel of water in less than a minute may be operated by a stream less than one-tenth of a gallon in a minute, and this supply may be accumulated for ten minutes or ten hours, or longer; when once the flow has begun the whole is drawn off with a rush. It requires no watching and no regulating, working with the precision of a properly balanced tumbler-tank, and without its friction and jar. Its large water-way affords ready passage for any material likely to reach it from the sewer. It is effective for flushing sewers of even the largest size, as well as for the smaller pipes, and it gives us a command over the questions of size and inclination, which greatly simplifies and cheapens the work.

In ordinary sewerage operations a considerable allowance is habitually made for the accumulation of silt, and a certain inclination is indispensable to give to the ordinary flow sufficient velocity to carry forward its solid matter. With this flush-tank the size of the pipe may be adjusted very closely to its theoretical

discharging capacity. It may be so arranged that nearly the whole system of mains will carry no flow whatever except during the rapid discharge of the tanks. It even becomes possible to lay very small and very long mains nearly level. In a flat country, with distant and inadequate outfall, where every inch in depth is of the greatest value, making even the shallowest tanks for the accumulation of sewage for flushing impracticable, this tank may be used in connection with the scantiest supply of water from any source which can be delivered a foot or two above the level of the sewer.

The inventor of this tank has recently been engaged in the sewerage of a town in England where the worst conditions presented themselves. The outlet was distant and of little depth, the main line very long, and the town itself entirely flat. Under the usual system provision would have had to be made for hand cleaning from end to end. The stream passing through the town was controlled by a mill owner, who would make no terms for supplying the water needed for ordinary flushing, there being no means by which the quantity required could be defined, nor any certainty that a heavy draught would not be made on his pond at some



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season of low water when the supply was barely sufficient for his work. Mr. Field readily contracted with him for a constant supply through a one-inch pipe. This was a definite amount, subject to no contingencies, and of no moment even in the driest time. It was leased for a mere nominal consideration, and it solved the whole problem. The small pipe-main was laid almost on a level line, bringing the point of outlet within the town to a depth that gave ample fall to all the branch sewers. A large underground tank at the head of the main, supplied by the small stream from the pond, is filled at regular intervals, and as regularly discharges itself through a 4-inch syphon with a flow sufficient to wash the main perfectly clean from end to end.

At Lenox, Mass., where it was necessary to get rid of the sewerage of the town by sub-surface irrigation, the problem could only be solved by holding back the sewage in a Field flush-tank until enough had been accumulated for the rapid and copious discharge to reach the very ends of the irrigation pipes. Where surface irrigation is adopted, a constant trickling overflow saturates and pollutes a small area. By Field's system the discharge may be regulated to send the whole supply of a day or a week, or a longer time, over a wide area, the flow being entirely arrested during the intervals.

By the aid of this device can be insured the periodical flushing, at longer or shorter intervals, of water-closets, of urinals, and of soil-pipes. Tanks are now being constructed for flushing the tall soil-pipes of the Florence apartment house at 18th street and 4th avenue,

in this city. They are gauged to a flow of 2½ gals. an hour, which is a very small flow, and not more than the unnoticed waste of a great proportion of ordinary water-closets. At the end of twelve hours they will have accumulated about a barrel of water, and this will be shot out in a very few seconds into the upper part of the soil-pipe, washing it clean quite through to the sewer.

The tank here illustrated and described may be had at Jennings' Sanitary Depot, A. G. Myers, manager, 94 Beekman street, New York.

Superior American Iron.

It is reported by the *Engineering and Mining Journal* that the Horicon Iron Company is engaged in manufacturing at Ticonderoga, N. Y., by a modification of the Catalan forge process, blooms which are expected to equal in uniform excellence the Swedish and Norway irons. The peculiarities of the process are chiefly: 1st. The ore, instead of being thrown cold upon the forge-fire, descends through a retort or chamber in the rear, into which it has been charged, mixed with charcoal "braize." By the time it has reached the bottom of this chamber, and is raked forward into the fire, it is not only thoroughly heated, but also reduced to metallic sponge. The chamber is heated by the flame-products of the forge-fire, and also by the combustion of carbonic oxid, generated from the ore and braize, and escaping through ports in the wall, to burn in the surrounding flue. 2d. The charging of the very fine ore-dust into another chamber, where it is pre-heated, and then taken by a screw conveyer and carried through a hollow journal and a small gas-pipe, into the tuyere, which conveys it into the forge-fire, and deposits it upon the surface of the loup. In this way a great loss of fine ore is avoided, and a saving of fuel is effected. There is still another peculiarity in these works, affecting the subsequent manipulation of the blooms. The loup is introduced into a Sweet's furnace, and thoroughly heated before shingling. In this way, it is claimed, a more complete removal of cinder and other refuse is secured. Certainly the blooms and billets thus treated exhibited great solidity and uniformity under the hammer.

The capacity of the four fires now in operation is about four tons daily, eight lous being taken out of each during the twenty-four hours. The experiment promises to be successful, and, if commercial results warrant, the capacity will be at least doubled. The ore now used is the Bessemer magnetite of the Crown Point Iron Company; but the Horicon Company possesses extensive deposits of its own, which it can use if necessary.

Labor in Chicago.

The *Chicago Tribune* lately sent its reporters to investigate the labor market of that city. The foundries, rolling-mills, and manufactories of the city were visited in turn, and inquiries were made with regard to the number of hands employed, the number wanted, applications for work, and other details. Of twenty establishments, employing 5,000 men, ten had all the men they wanted, and five wanted more, but could not get them, while the remaining five had very few applications for work. One employer stated that in his line there was not a man in Chicago out of work through necessity. Others believed that any industrious man that wanted work could get it for laborers' wages—\$1 to \$1.50 per day. Skilled laborers get from \$2 to \$3 per day, which gives fair support, considering the low cost of the necessities of life. The *Tribune* is convinced that the clamor of "no work" and "hard times" does not come from men who work and want to work, but from those who ornament street corners waiting for better times and higher prices, a class of men to be found at all times.