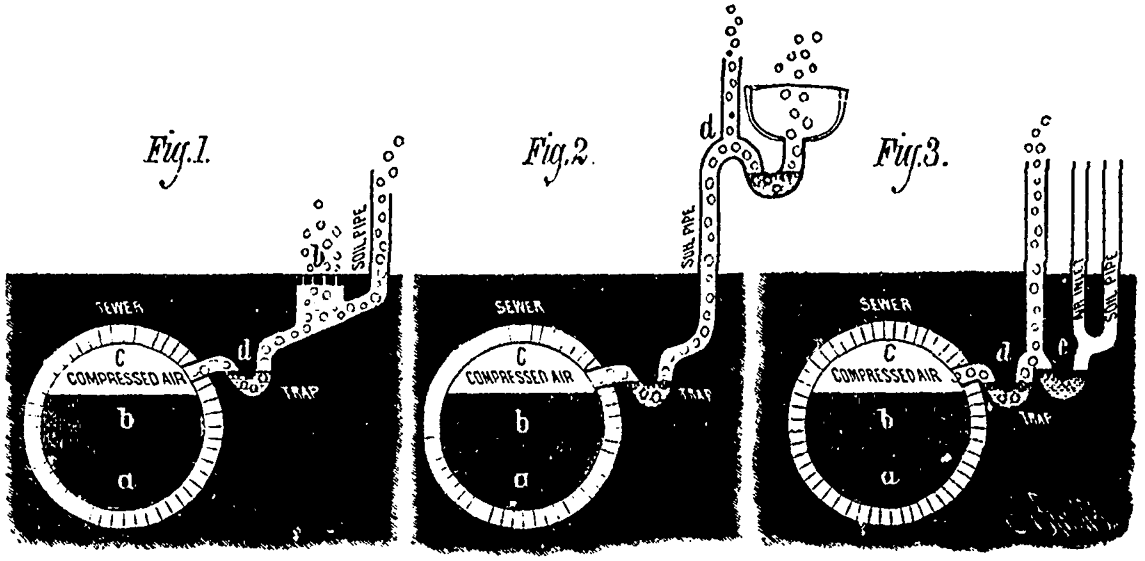
THE INFLUENCE OF STORMS UPON WATER TRAPS.



A recent issue of the *Sanitary Record* (London) contains a valuable article on "The Influence of Storms upon Water Traps," by Henry Masters, The points he makes have application in cities in which the sewers are not ventilated. Strangely, there is considerable opposition to sewer ventilation, or, at the least, indifference to it; the result is indicated below.

There are three influences which affect the water seal of a trap, viz., the diffusion of gases, the absorption of gases by the trap water, and pressure by storm water; it is the latter influence which I propose in this paper to describe. I will suppose a common sewer to be cylindrical, and in dry weather the quantity of sewage passing through it is shown by the horizontal lines at *a*, Figs. 1, 2, and 3, and the space, *b* and *c*, above the average sewage contains sewer air; so long as the sewage does not rise above the average height, *a*, no pressure exists (except by the diffusion of gases, with which at present we have nothing to do). But suppose a storm occurs, and sufficient water passes into the sewer by way of the street gullies and house drains to raise the water in the sewer to the perpendicular lines, *b*, a certain amount of pressure will be the result, and the air, *b* and *c*, will be compressed into the smaller space, *c*, and in the proportion of *b* to *c*. The condition of the sewer air will now be much more dense and elastic, and press equally upon the intrados of the sewer and on the surface of the sewage, and if there were no escape for the compressed air, and the storm water rose higher and higher, the air would become denser and denser, until the pressure of the imprisoned air became equal to the entrance supply column of storm water, and then the water would cease rising; in our unventilated sewers this condition of things would exist, if it were not that a large number of house drains join the common sewer somewhat in the manner shown in my diagrams.

I have shown upon Fig. 1 an open disconnecting trap, *d*, and what would be the influence of water rising (as I have described) upon such trap. The compressed sewer air is being forced into the house drains, as shown by a series of circles; in the first place, the air will force the trap at *d*, and then may escape into the open air through the perforated cover, *b*. But if the soil pipe, *c*, be open at its top, or there be any defect in it or in the house drains, there is a possibility of an up or inward current being established, and a portion of such sewer air will be drawn into the house drains and escape by way of the soil pipe, or into the house; thus, to a large extent, the house drains will not be effectually cut off from the common sewers, for sewer air by entering the house drains neutralizes to a considerable extent the value of the disconnecting trap.

Fig. 2 shows a common arrangement of trapping drains, and, also, a common arrangement of four inch soil pipe ventilation by the extension of the soil pipe less in capacity than the soil pipe itself; it is not an uncommon thing to find such extension pipes varying from three-eighths of an inch to three inches in size. The effect of pressure *in such cases is as I have* again shown by circles (see Fig. 2). It will be seen that the compressed air ascends freely until it reaches the bend of the soil pipe at *d*, and at this point a portion escapes up by the small soil pipe extension and into the open air, as shown by small circles, but the major part forces the closet trap, and, of course, enters the house, thus showing for effective ventilation the absolute importance of soil pipes being extended their full size, and, if terminals of any kind be fixed upon their upper ends, the openings of such *terminals must be at least of the* same area as the soil pipe, for any less size would check the ascension of the air, and an undue pressure be put upon the closet trap water, and the chance of the water seal being broken in consequence.

The effect of air pressure upon a double water seal trap is shown in Fig. 3, and although the compressed air, as in Figs. 1, and 2, forces its way through the trap, *d*, nearest the sewer (the escape being of the same area as the drain itself), the inner trap, *e*, will not be *affected by* pressure; *the sewer air is* effectually prevented from entering the house drains by this precaution, showing the importance of two complete water seals to a main trap, and, also, that a large escape pipe should be set between the traps.

In dealing with large soil pipe drains, great difficulties exist in effectually arranging the drainage of a house so as to exclude sewer gas, and to exclude this no one will doubt to be of primary importance. If a disconnecting chamber, or an escape pipe, be the safeguard adopted, *the perforated grating, or pipe,* should be of equal area to the drains it has to relieve; thus, a nine inch drain must be provided with perforations or pipe equal to about sixty-three superficial inches; a six inch drain, *twenty-eight* inches; and a four inch drain, thirteen inches. Perfect safety cannot be obtained unless this rule is made absolute.—*Scientific American.*

NOTICE OF MEETING.

AMERICAN INSTITUTE OF MINING ENGINEERS.—The Autumn Meeting of the Institute will be held in Troy, N. Y., during the second week in October. This meeting will be mainly devoted to the reading and discussion of papers. Members who wish their papers fully discussed at the meeting can have them printed and circulated in advance, if they are sent to the Secretary early in September. Thomas M. Drown, Secretary, Easton, Penn.