

It is almost superfluous to say that every precaution should be taken to prevent sewer gas from disposing of itself in the first mode,—by finding its way into houses; and yet a very great deal of carelessness exists on this point.

It will be necessary then to consider how sewer-gases obtain entrance into houses:—

1. In some cases there is no "trap" interposed between the drain or sewer and the interior of the building served by that drain or sewer, no attempt at any mechanical impediment to the return of sewer-gas. This, of course should not be the case. Some form of trap should be placed as near as possible to the commencement of every waste-pipe.

2. Where there are traps they are liable to be forced. Some persons think that if they have a trap all is right, but a trap without a vent is of hardly any practical value. A trap with a protecting depth of water (commonly called the "seal") of three inches, (a three inch seal), only resists a pressure of some two ounces to the square inch. Any person can readily convince himself of the insufficiency of a water trap without a vent by filling such an one and blowing through it. Without any great exertion he can displace the water and force his breath through the trap. If he now make a vent between his mouth and the water he cannot displace the latter no matter how hard he blows.

Let us next consider what influences are at work to force gas back through traps:—

a. The expansive force caused by pouring water into a drain: two bodies cannot occupy the same space at the same time, and if the lower part of the drain be full, or its mouth be closed by water in the sewer into which it empties, then the sudden pouring in of water will cause the confined gas to burst its way back through the trap.

b. Storm-water suddenly filling the sewers has the same action.

c. The expansive force of hot water entering increases the temperature and consequently the bulk of the air. If raised suddenly from 50° to 150° the result would be a pressure equal to nearly seven feet head of water.

d. Direct afflation through the sewer: the wind blowing up the sewers will force the sewer-gas backwards. Some engineers have proposed flap gates at the mouths of sewers. But it is better to let the fresh air blow up, and make sufficient vents for it to sweep through and purify the sewers.

e. Partial choking of the drain gives rise to confined air constantly increasing, expanding and being displaced. A vent allows the escape of all gas which would otherwise force the trap.

3. Again, sewer-gas may be admitted on account of the trap being emptied by syphoning. If to the end of the trap a tube bent downward be added, it forms the long leg of a syphon, the portion of the trap to which it is added being the short leg; if a full stream be poured through the trap, the water will syphon out of it, leaving the seal broken, as may be proved by actual experiment. An opening or vent at the arch of the syphon will of course prevent this.

4. A large body of water rushing full bore down a pipe into which a trapped tube empties will suck the water out of the trap.

This, again, will be prevented by a vent pipe.

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