Mercury Seal Traps

versus

Sewer Gas and Malaria.

Simple in construction. Sure and perfect in action.

Mercury a perfect seal where water fails.

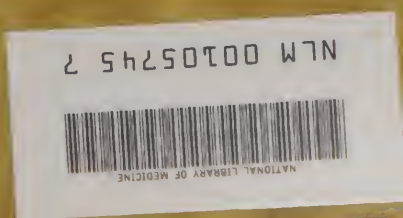
The Mercury Seal and Trap has been examined, tested and endorsed by the leading sanitarians of the country, and can be attached to any wash-basin, sink, water-closet, etc., and will afford immediate, perfect, and permanent protection against sewer gas.

Manufactured and for sale by the

Sewer Gas Mercury Seal Co.,

1003 Chestnut Street, Philadelphia.

1883.

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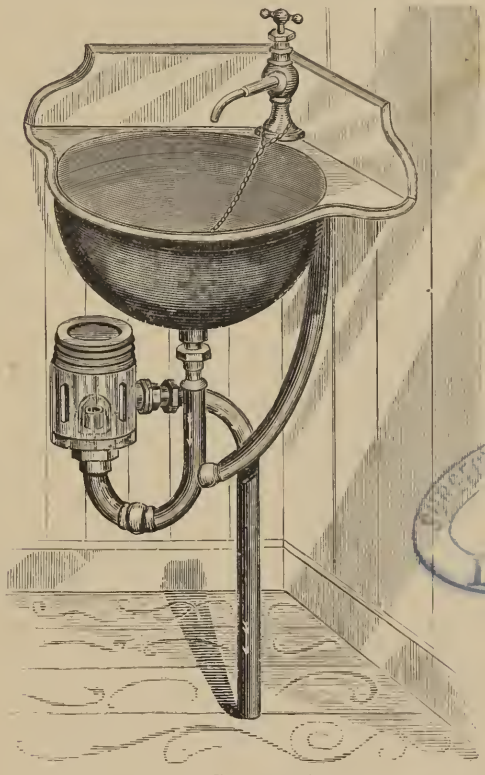

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To the Public:

In presenting the claims of the Mercury Seal Traps to the attention and consideration of the public, it is desirable to impress upon the residents of large cities the following important facts in reference to drainage and sewerage, which cannot now be gainsaid or contradicted.

First: That the sewerage and drainage of all modern and growing cities, more especially Philadelphia (on account of its large area), is imperfect and unscientific. The sewers in the streets are very large, and it takes a great deal of water to fill and cleanse them. If they happen not to be full, the circulation through them is sluggish, so that much of the dead organic matter carried into them remains there and decomposes. The result of this decomposition is to form injurious gases, which on account of the natural tendency of gases to ascend, will find their way back through the pipes they have once passed through as solids or liquids, and, unless prevented, will emerge and escape at the water-closet or wash-basin to mingle with and poison the atmosphere of dwelling-houses, producing all the suffering and injurious effects of sewer-gas poisoning, commonly known as malaria, typhoid fever, and other kindred diseases.

Second: That houses at best being nuisances, and prejudicial to health, and drainage therefrom an absolute necessity, it is criminal carelessness not to provide and adopt the most perfect and reliable traps and seals, as an ounce of prevention is better than to be compelled to resort to a thousand pounds of cure.

Third: It is now demonstrated, and admitted by all sanitary experts and engineers, that all seals and traps wherein water is used as the seal, are greatly defective,

and in many instances produce the very result which they are intended to avoid; as witness the following valuable opinions:

Colonel Waring, speaking of common water-seal traps says: "Such a seal will yield a variation of barometric pressure of four-tenths of one per cent., so, when pipes are extended to the open air, it is often that the pressure is from out the house inward."

In the American and Field Architect notes, November 25, 1882; the same writer says: "Dr. Lissauer, of Dantzic, has made some notable experiments, which would be more useful if we knew the condition of the drains from the house and the sewer. It was supposed not to be trapped, but the fact that nearly, if not quite all, of his results, show that a pouring down of water produced a compression of air in the soil-pipe, causing a forcing of the traps towards the house. The compression caused by descent of water in the soil-pipe sometimes blew out a taper, or, when the trap was sealed, forced its water over the house end of the trap."

"Water is an acknowledged absorbent of noxious gases and elements, and unless it is changed in conformity with its absorption, it gives out the same noxious elements in a more developed state than when originally absorbed."—*American Engineer, November 3, 1882.*

O. M. Wright, M. D., Health Officer, Detroit, Michigan, says in his report, July, 1882, it is a well-known chemical fact that liquids absorb and transmit gases. Recent experiments at Glasgow and New York prove that sewer gas passes abundantly through the water in the trap, even where there is no outside pressure or inside suction to help it along.

Dr. DeVerona, expert on sewer-gas, etc., says: "Sewer gas saturates water very readily, and passes through it with the greatest ease. It takes only fifteen minutes for ammoniacal gas to react upon litmus paper through a trap seal through a column of water two inches in depth."

Dr. Wells, former health officer of city of Cleveland, in his report says: "To depend upon water traps to prevent the passage of sewer gas is foolish, since water will readily transmit gaseous bodies."

In a paper read before the Social Science Congress at Glasgow, Dr. Ferges said: "All sanitarians are agreed as to the necessity of trapping drains, and many contrivances have been adopted in order to do so. We may explain that a trap is a body of water interposed between the sewer and the pipes leading into our houses to prevent the entrance of sewer gas through the pipes, and generally supposed sufficient to do so. I may be allowed to state that to ventilate the sewers is quite as important as to trap them. And let us pause a moment to inquire whether we are using the proper term. The term "ventilation," I should suppose, means the replacing of foul air by fresh air, for which the various plans proposed fall short. They do indeed provide for the escape of a certain portion of foul air from the sewer into the open air, not however to be replaced by fresh air, but by equally foul air from the decomposition going on in the sewer. I must not be supposed as undervaluing the sanitary advantage of the removal of foul air from the sewer; indeed, ventilation, strictly so called, hardly exists. Formerly I did believe in the ventilation of sewers; this was quite a cherished idea, and I abandoned it with great reluctance. But experience, observation and reflection compelled me to do so. My impression is that the following is the process going on without much cessation, namely, the sewer air is absorbed by the water on the sewer side of the trap and discharged in the house end of it. I have not hastily arrived at this conclusion; it has been forced on me as the only solution of all the facts of the case—the passage of sewer air through the water of the trap.

Colonel Waring further says water-seal S traps, even when vented, are not safe under all, or nearly all circumstances. Practically you may trust them so far as you

can see them, and no farther, and even then, only when you do see them constantly.

From the foregoing summary of conceded authority upon the subject, it can no longer be denied that water seals must, sooner or later, be superseded. And it is only within a comparatively brief period of time that general attention has been called to this question by sanitary experts and the medical world, of the dangers lurking within our homes, not only on account of untrapped pipes, but the dangers resulting under a false notion of safety arising from the use of the water seal.

The only liquid substance yet discovered to take the place of water in producing a perfect and complete seal, is mercury. "A."

The following explanation of the Mercury Seal Trap is taken from the remarks made before the Philadelphia County Medical Society, Wednesday, March 23, 1881, by Benjamin Lee, A.M., M.D.:

The Water-Closet.

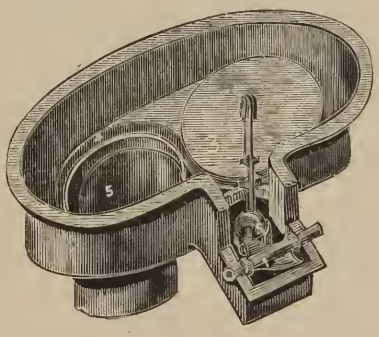
"Independently of leakage, sewer gas enters our homes in three ways. The water-seal of the trap of the water-closet, stationary wash-stand or wash-tub, or bath, as the case may be, may become inefficient, 1st, in consequence of the water falling below the protective level from evaporation, when the appliance is for some time unused; 2d, from what is called siphoning—that is, the production of a vacuum in the soil-pipe, by the sudden rush of water from a closet on a higher level, which sucks out the water from the trap; and finally, in consequence of saturation,—that is to say, the water slowly absorbs the gas in contact with its sewer surface until it becomes entirely saturated; as soon as this has taken place, it begins to give it off at its closet or basin surface as rapidly as it receives it at the other.

"This last is perhaps the most dangerous, because the most insidious, form in which the poison finds access

to our homes. It is that which takes place all through the night from the wash-stand which is by our bedside, or the bath-tub in the adjoining dressing room, while the water-closet is more apt to be in a distant part of the house, and quite distant from sleeping apartments. The appliance to which I now call your attention affords a complete remedy for this evil as long as it is in position. During the brief time in which the closet is in use, it is not operative; our protection then must be in the water-trap, which still exists below this, and in ventilation. And I would here briefly say, in passing, that thorough ventilation is a *sine qua non* in sanitary plumbing. No system of plumbing should now be introduced into any house which does not include a ventilating shaft as large as the soil-pipe, having its top above the roof of the house, and running, if possible, along the smoke-stack, so that the heat thus communicated may create an upward draft.

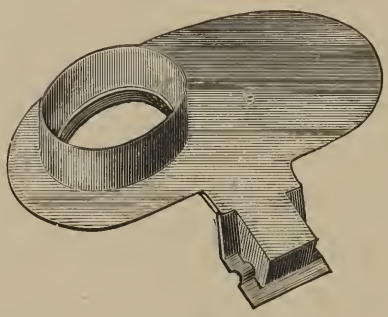
"With the aid of this model I think you will have no difficulty in understanding the contrivance, which is simple and not easily disarranged, although, at the same time, a very beautiful piece of mechanism.

"The hole which you observe in this metal casting is just the size of the top of the soil-pipe, and is

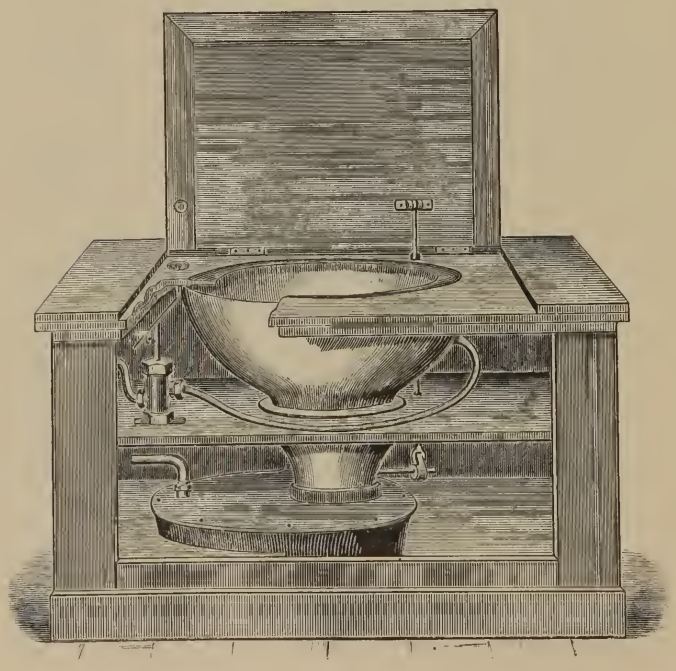


continuous with it, being below the hopper and above the water-trap. Around the edge of this hole, and on

the upper surface of the casting, is a trough about three-fourths of an inch deep. This movable cap which I now show you is provided with a flange on its under surface



exactly corresponding to the trough. Now, it will readily be understood that so long as this flanged cap sits in a fluid in the trough, provided this fluid is impervious to gases, so long is the passage of gas beyond it a physical impossibility. Such a fluid we find in mercury.



It cannot evaporate ; it is too heavy to be siphoned out ; and it does not absorb gases. Its loss from oxidation is so slight as to be almost imperceptible. This cap is moved on and off from the opening of the soil-pipe by means of an ingenious contrivance known as 'Spratt's Movement,' in which the opposite end of the lever, which is attached to its upper surface, articulates, as you see, by means of this spherical head with a deep spiral groove on a horizontal shaft. This shaft is attached by a sort of crank-rod to the cover of the seat. Now, as I lift the cover I also lift the cap and throw it to one side in a chamber provided for the purpose ; as I shut down the cover I replace the cap, and the seal is perfect. This appliance can be adjusted to any water-closet of whatever description. In case of there not being sufficient thickness of joist to allow of its being set under the floor, the seat must be appropriately raised,—say, about three inches. This slight inconvenience can be met by placing a low step in front of the seat.

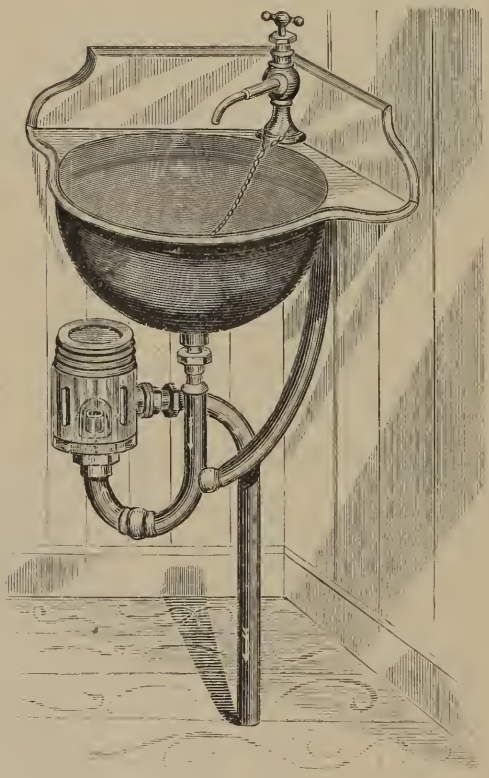
The Wash-Basin Trap.

"I now show you the seal for the wash-stand and similar arrangements. It is made of glass, so that if out of order the fact can be detected in a moment. It consists of a cylindrical glass reservoir closed at the top and admitting the waste-pipe through its bottom. The waste-pipe ascends to within about two-fifths of the distance from the top, terminating in a free extremity ; over this free extremity sits quite loosely a glass cup like a small tumbler turned upside down. At about the level of the free extremity of the waste-pipe there is a hole in the side of the reservoir for the escape of the water.

"As in the case of the water-closet seal, mercury is again used as the sealing fluid. Here it covers the bottom of the reservoir to a depth of half an inch or more. The working of the appliance is as follows:

When a stream of water enters from below, it lifts the inverted glass cup out of the mercury, as I now lift it with this pen-holder. Flowing out under the rim of the cup and over the surface of the mercury, it fills the reservoir and escapes at the opening in its side. The moment the current ceases, the cup falls back into its place, and should there be any reflux of gas it exerts its pressure on the top of the cup, thus firmly holding it in the mercury and adding to the security of the seal."

The following cut shows the action of the seal-trap attached to a wash-basin, situated in a sleeping chamber, or other room.



The offices and show-rooms of the above company are now open to the public for the inspection and

explanation of the most approved and effective means yet devised to prevent the escape of sewer-gas and other deleterious vapors into houses and buildings.

The inventions covered by the several patents now owned and controlled by this company, have been in the course of experiment, use and improvement for the past two years, under the direction of the best experts; and they have now arrived at that state of completion and perfection when they can be confidently offered to the inspection of, and for adoption by, the public, as the best, cheapest, and most effective means yet devised to effectually exclude the escape of poisonous gases from sewers, drains and waste-pipes, into dwelling-houses and buildings.

At the same time the company is not so prejudiced in favor of their own invention as to overlook or disregard the merit of other inventions.

Therefore, in addition to the practical means offered by the company, they have organized the following departments:

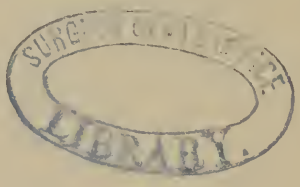
First: A consulting board of sanitary experts, whose business it will be to inspect and report upon the sanitary condition of dwellings and buildings; which report will be in writing, and will indicate plainly the defects and conditions which may exist, and suggest the most effective means of remedying the same, together with an estimate of the cost thereof. This report will be made without regard to the adoption of any of the inventions of the company, or to whom the plumbing work may be given. This system has been adopted after careful consideration, so that the company may guarantee the reports to be correct and disinterested. The cost of such inspection and report will be nominal, depending upon the size and character of the building, dwelling and surrounding.

Second: A designing and construction department for the designing and construction of the ventilation, draining and sewerage of buildings and private grounds, on the most approved principles of sanitary engineering.

Third: A general plumbing department, including all ordinary plumbing in detail, and having especial reference to water-closets, sinks, wash-basins, and inside work of buildings where the dangers of sewer-gas are most prevalent.

The public are invited to call at the office, where every facility for examination and explanation will be afforded by the general superintendent or those in charge. Pamphlets and circulars giving full details can be had on application in person or by mail.

The Sewer Gas Mercury Seal Company,
O. B. EVANS,
General Superintendent,
1003 Chestnut St., Phila.



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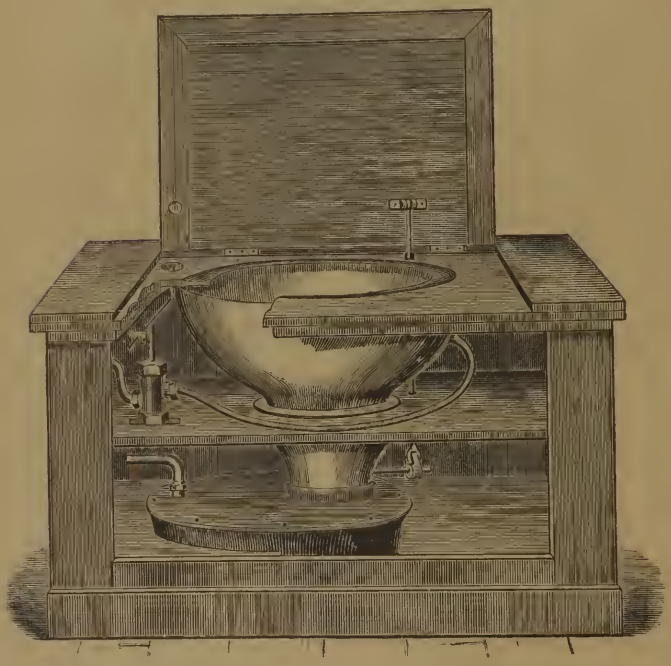

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