IMPROVED ODORLESS WATER CLOSET.

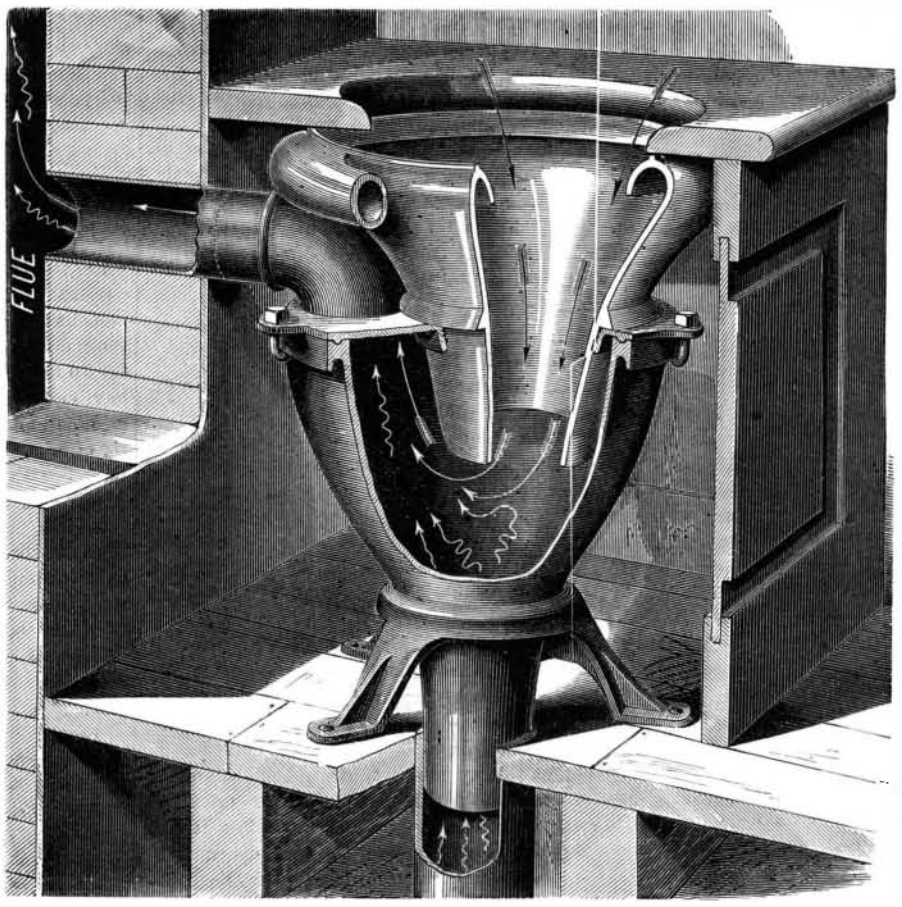
It is just now beginning to be understood that the results of defective drainage are pestilence and death, and, moreover, that many of the safeguards, hitherto relied upon as protections, are in fact no defense whatever. Into the public sewers all kinds of excrementitious matters, waste, and offal, are deposited, along with abundance of water, and the whole is exposed to a temperature favorable to fermentation. The offensive sewer gas is the product, which seeks to escape from its confinement in the sewer by every practicable outlet. The only protection against this escape, commonly employed, is the water-sealed trap, usually in the form of an S, the lower bend of which is supposed to be constantly filled with water, and to prevent the passage of sewer gas. It is known, however, that a pressure of two ounces or less per square inch is sufficient to displace the water in any trap, and this small pressure is frequently exceeded by the gases confined in the pipes. Such augmented pressure may be produced by the influx of a stream of water, by the variation of temperature caused by the entrance of hot water, by wind blowing into the open mouth of the sewer, or by the backing in of tide water, by flushing, etc. In addition to these are other causes capable of unsealing traps, as the disturbances of pneumatic pressure in flushing some distant part of the pipe, siphoning by portions of some textile fabric, as a cord, string, or rag washed partly out of the trap, evaporation, etc. The presence of the characteristic smell in the vicinity of a water-closet denotes that some one of these causes is at work, forcing or aiding the escape of the gas from the opening of the waste pipes.

Traps are designed to suppress and keep in confinement the gaseous products of sewer decomposition. We have repeatedly pointed out, however, the defects of the trap system, and have also expressed the opinion that the best precaution is found in properly directed ventilation, by which the noxious exhalations will be harmlessly carried away. We are therefore able to pronounce favorably upon the invention herewith illustrated, which is based upon the ventilating principle, and in which the bowl of the water closet is directly connected with a chimney or other flue, through which a draft of air will be caused to flow upward and be discharged above the house top. It will be perceived that this arrangement merely constitutes a siphon, the long leg of which is the flue and the short leg the bowl of the water-closet, and that the well known siphon action must ensue. The effect, we are informed, is a complete and perfect prevention of the escape into the apartment of any gas or odor from the soil pipe or interior of the container. This effect is well represented by the arrows in the engraving, the regular ones denoting the flow of pure air, and the crooked ones denoting sewer gas or foul smells. With these closets traps may be advantageously dispensed with, because whatever sewer gas comes to the container will go up the chimney instead of into the apartment, and its presence is immaterial. Besides, with a free outlet of escape at every closet, there could be no accumulation of such gas, and the work of disposing of it would be constantly going on.

These closets are in successful use in the cities of Washington, Baltimore, Cincinnati, Chicago, and elsewhere, and in no instance have they failed to give entire satisfaction. The inventor guarantees them to be perfectly odorless in every instance, if properly set.

With reference to the liability of a down draft in the chimney to cause an overflow of gas, the inventor says that he has not yet encountered any such effect in a well constructed chimney into which air could enter anywhere below the top, and that if the chimney does not draw properly it is simply a case for correction, and must be made to draw. There are also several minor points of improvement worth noticing. The container is placed upon legs, which gives the plumber access to the soil pipe joint, and enables him to caulk it tightly without trouble. The cover is fitted with a rib entering a groove in the rim, so as to insure a tight joint there, with but little material. The bowl is bedded in putty or cement under the flange and down beside the neck for an inch or more, which insures for it a very firm seat.

Patents for this invention have been granted to R. D. O. Smith, 613 Seventh street, Washington, D. C., to whom inquiries for further information should be addressed.



SMITH'S ODORLESS WATER CLOSET.

HALE'S DUPLEX WATER ELEVATOR.

We represent in the annexed engraving a new elevator, the motive power for which is obtained, first from the weight of a column of water, and, second, from the normal pressure of the atmosphere. These forces are applied to raise the carriage through the medium of a piston traveling in a vertical tube, and in connection with suitable hoisting apparatus.

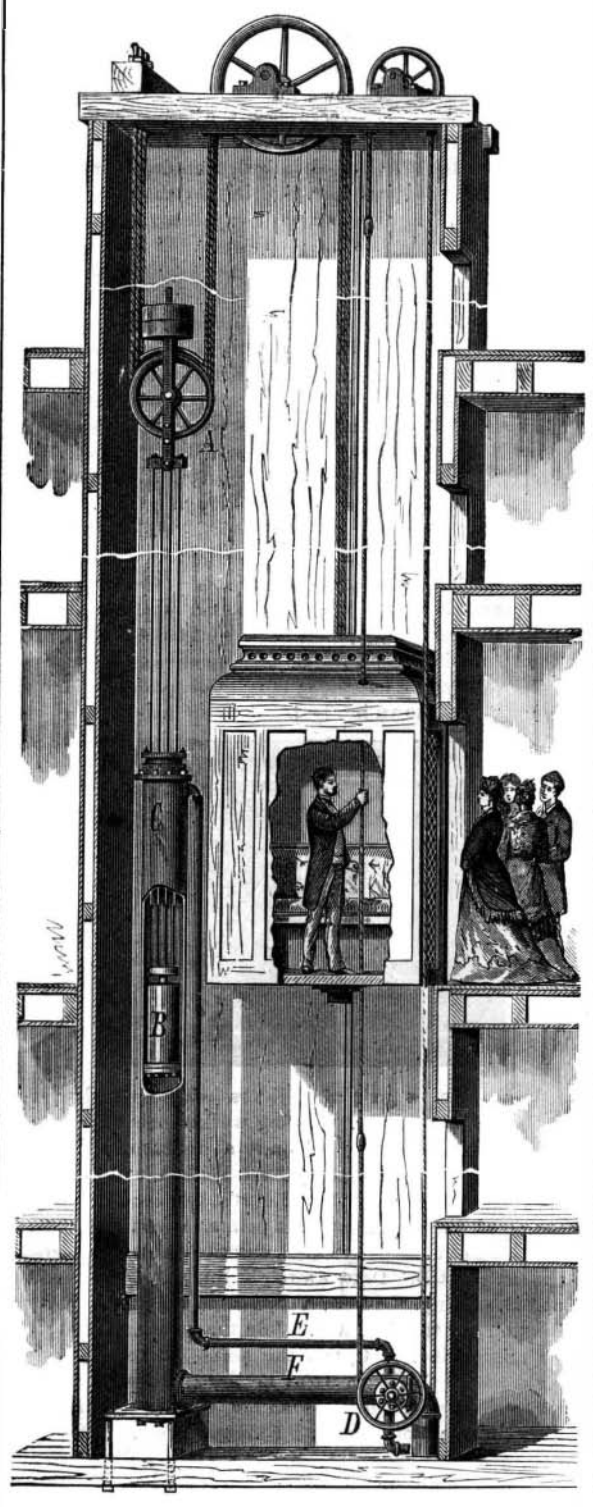
By these means a machine, simple in construction, is produced, and at the same time one claimed to possess the important advantages of cheapness, safety, certainty, and smoothness of action. There are various ways of applying the power above named, different from the plan here illustrated, and of which the manufacturers have likewise availed themselves; but to these it is not deemed necessary to make other than this passing reference, since the reader will obtain a good idea of the principle upon which all are based from the present engraving and description.

The carriage is secured by several ropes which pass up over a fixed pulley wheel, thence to a weighted gin block, A, and their standing parts are secured above, as shown. The weight on the block, A, together with the piston, B, constitute a counterpoise for the carriage. The piston, B, is attached to the gin block and traverses the tube, C. When the carriage is at the lowest point of its course, the piston is at the upper end of the tube. To cause the carriage to rise, the rope, passing through it and shown in the hands of the figure, is pulled, thus opening a valve at D, which admits water through the pipe, E, on top of the piston, and at the same time opens an exit pipe, F, for the water already in the tube below the piston. Since the weight of the carriage itself is compensated for by the counterpoise already mentioned, the resistance to be overcome reduces itself to the load added *plus* the inertia of the various parts. Against this we have, first, the weight of the air, 15 lbs. per square inch above the piston. This is obviously gained through the escape of the water below, the tube giving a column of the latter about thirty-three feet in hight. Second, the absolute weight of the water itself acting on said piston; and, third, as a variable force dependent upon outside circumstances, the pressure of water which may exist in city mains or may be due to difference of level between the top of the tube and a tank located in the upper story of the building. The result of this condition is necessarily the descent of the piston and the elevation of the carriage, the water below the piston meanwhile escaping into the sewers or being led into a tank, from which it may be raised by any suitable means to the tank in the upper story, and so be used over again.

To lower the carriage, no outside power is called into use, a point of advantage of this system over steam elevators, which require a large expenditure of steam to hold the load in descending. The valve rope is pulled so as to set the valve, at D, in the opposite direction, so that the water now enters beneath the piston, passes again through F, and escapes through E. The carriage then sinks slowly and noiselessly, without jar or shake.

That this invention is economical, as compared with steam elevators, will be generally obvious. There is no engine or boiler, requiring care, fuel, and repairs, and in fact there is no reason why, after the apparatus is once constructed of good durable material, it should not last until worn out, at no further expense save that of the water used, as determined per meter, or at that involved in the pumping of the water from the lower to the upper story. It is easy to operate, it stops automatically at the top and bottom of its course, it includes devices (not here represented) for graduating the power employed in proportion to the load, and safety appliances for preventing its fall in case of accident to the hoisting gear.

The invention is covered by six patents, the latest dated April 20, 1875. For further information address the manufacturers, Messrs. W. E. Hale & Co., 56 and 58 Park Place, New York city, or 107 and 109 Lake street, Chicago, Ill.



HALE'S DUPLEX WATER ELEVATOR.

A Collodion Polarizer.

In the *Archiv* Dr. Schnauss says that for some years he has used small bags prepared from thick collodion in bis dialytic and endosmotic researches, and that, latterly, Herr Grippon has employed collodion film peeled off clean glass plates in his experiments with polarized light and the radiation of heat. The collodion film polarizes reflected as well as transmitted light, provided the thickness of the skin be, by exact microscopic measurements, between 0·0C0333 inch, in which case the angle of the greatest polarization would be=38° 55, and its reckoning index=1·5108. The skin allows 0·91 of the heat radiating from a luminous source of heat to be transmitted, while a darkened vessel with boiling water only allows 0·70 to pass through; but if the heat radiating from the water be but 50°, then only 0·50 passes through.

From this it will be seen that the radiation from a vessel producing 100° of heat, when transmitted through two superposed collodion skins, still retains 0·583° of heat. Further, the greater transparency of collodion renders it a suitable substitute for mica in producing polarization, and the ease with which it can be prepared counterbalances the greater durability of the mica; and its great dia-thermometric powers recommend it as a vehicle for experimenting upon the radiation of heat.

The War Kite.

Mr. Simmons, the aeronaut, who is the inventor and patentee of a machine named the parakite, lately made a somewhat successful experiment with this invention at the Alexandra Palace, London. The machine used on this occasion was 30 feet high and 30 feet wide. As soon as the sail was fixed over the framework, and the front or windward point of the parakite was raised so as to allow the wind to touch the machine on its under surface, it was instantly converted into a concave form and showed symptoms of rising. The wind was blowing at the rate of not more than two miles an hour; but with this slight breeze Mr. Simmons was carried into the air. We understand that these experiments will be repeated a few times previously to public demonstrations; and should they continue to be successful, the invention can be put to practical utility for war purposes, engineering, and signaling, where it is necessary to attain lofty elevations. The machine above referred to covers an area of 700 superficial feet, and its entire weight is 100 lbs. The inventor asserts that it can be used successfully in any wind ranging between 4 and 40 miles an hour, and an altitude of from 600 to 1,000 feet can be attained.