

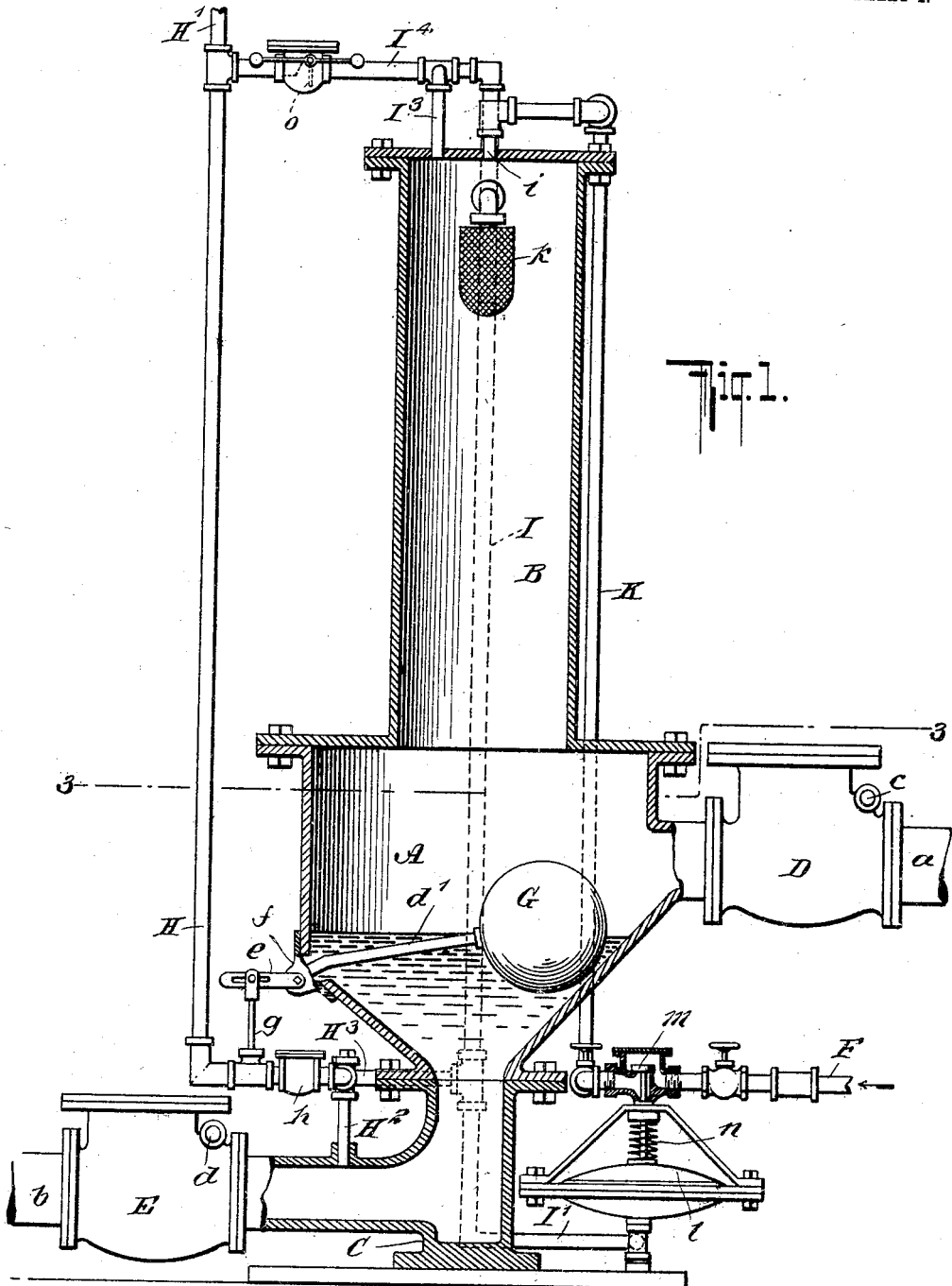
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W. MCCLINTOCK.
SEWAGE EJECTOR.

APPLICATION FILED MAY 11, 1907.

2 SHEETS—SHEET 1.



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UNITED STATES PATENT OFFICE.

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SEWAGE-EJECTOR.

No. 884,406.

Specification of Letters Patent.

Patented April 14, 1908.

Application filed May 11, 1907. Serial No. 373,161.

To all whom it may concern:

Be it known that I, WILLIAM McCLINTOCK, a citizen of the United States, residing at New York city, in the county and State of New York, have invented certain new and useful Improvements in Sewage-Ejectors, of which the following, in connection with the accompanying drawings and reference characters marked thereon, is a full, clear, and exact specification, sufficient to enable others to make and use my invention.

The object of my present invention is to provide or produce a sewage ejector, or sewage lift as it is sometimes called, of few and simple parts, easy to construct and mount in place, which will be automatic in action, efficient, reliable, durable and not liable to get out of order.

To accomplish the aforesaid object and to secure other and further advantages in the matters of construction, operation, application and use, my improvements involve certain new and useful particular features of construction, relative arrangements or combinations of parts and principles of operation, as will be herein first fully described and then pointed out in the claims.

In the accompanying drawings forming part of this specification I have shown a sewage ejector or sewage lift constructed and arranged for operation in accordance with my invention and involving the principles thereof.

In these drawings Figure 1 is a vertical view, partly in section and partly in elevation, showing the complete apparatus ready for use. Fig. 2 is a top or plan view corresponding with Fig. 1. Fig. 3 is a horizontal section and plan view on planes through line 3—3 of Fig. 1. Fig. 4 is a view, partly in section and partly in elevation, of a fragment of the upper part of the device as shown in Fig. 1, on a plane at right angles with that of Fig. 1 and looking to the right.

In all these figures like reference characters, wherever they occur, indicate corresponding parts.

Sewage ejectors or sewage lifts of this general class are usually employed in buildings or other structures wherein it may be desirable or necessary to elevate the sewage from one grade or level to a higher one, in order that it may be properly discharged into the sewer or elsewhere.

A is the lower part of the receiving tank on which is mounted an extension, B, of smaller diameter for purposes to be hereafter ex-

plained. The tank is mounted on any suitable form of base, as C, and it receives sewage at any convenient point, as through the pipe *a*, and preferably discharges it through an opening in the bottom connected with the base and leading to the outlet or discharge pipe *b*, but the particular arrangement of inlet and discharge is not material. A valve casing, D, is located between the tank and the inlet, and in this is a check valve of any of the ordinary forms, the axle of which is shown at *c*, to prevent back-flow when pressure is applied. A valve casing, E, is also applied between the outlet pipe and the tank, and this is supplied with any ordinary form of check valve, the axle of which is represented at *d*, to prevent back-flow of the material which may be ejected.

F is a pipe for admitting steam or air under pressure to accomplish the required ejection or lifting of the material.

The design of the apparatus is to automatically admit steam or air under pressure as soon as the tank becomes filled to the desired height and to cut off this inflow as soon as the tank has been sufficiently emptied of its contents.

G is a float located in the tank and arranged to rise and fall with the material therein. The arm, *d'*, of this float within the tank connects with a suitable arm, *e*, on the exterior through a suitable packing casing *f*, secured against leakage; and the arm *e* is connected with and arranged to move a stem, *g*, of a valve in a branch of the tube H leading up to and connected with a suitable ventilating pipe, as H¹. A branch, H², connects with the discharge outlet from the tank and another branch, H³, connects with the pressure pipe 1 leading to the device for opening or closing the inlet valve for steam or air under pressure.

Between the branch H² and the tube H is a valve, the casing of which is represented at *h*, to close the communication between the branch H² and the tube H to prevent material from entering and interfering with the operation of the valve controlled by or connected with the float G, but to permit the out flow of water through the branch H² from pipe 1, through branch H³ as soon as the float G descends.

K is a pipe extending up and preferably over the top of the tank and communicating with the interior, as through the branch *i*, to deliver steam or compressed air over the top

of the contents of the tank when the valve which controls the operating fluid is opened. The pipe or tube 1 extends to nearly the top of the tank and has a branch entering the same, the open end of which is protected by a sufficient strainer, represented at *k*, to prevent the possibility of coarse material entering the pipe 1, should it rise sufficiently high in the tank to cover the mouth of this pipe.

10 A branch 1¹ leads to the underside of a diaphragm, represented at *l*, and this governs a valve, as *m*, in the steam or air supply conduit, the same being held normally closed by a suitable spring, *n*, assisted by steam or air pressure on top of the valve.

15 Under the construction and arrangement so far shown and described, when the sewage rises in the tank to a sufficient degree, water will enter pipe 1, passing down through branch 1¹ and under diaphragm *l* to open the valve *m* and thus automatically admit fluid under pressure through tube *K* to the top of the tank, which fluid will force the contents of the tank out through the discharge pipe *b* and thence to the sewer or other receptacle. After the pipe 1 has received one charge of water, a portion of that charge will remain in the lower part of the pipe and in the branch 1¹ and will thereafter be affected by the pressure produced in the tank upon the rise of the contents therein even if the contents do not rise high enough to cover the branch leading through the side to the interior of the top of the tank. As the material descends in the tank the float *G* descends with it, causing the valve stem *g* to rise or the valve controlled thereby to open, thus permitting the pipe 1 to be drained down to the level of branch *H*².

40 Connected with the pipe 1 and communicating with the top of the tank *B* is a branch 1³ and also a branch 1⁴ leading to the ventilator pipe *H*¹. In the branch 1⁴ is a light, balanced valve, represented at *o*, the purpose of which is to close the passage through the branch 1⁴ as soon as pressure is admitted to the top of the tank through the pipe *K* but which valve will remain normally open so that the contents of the tank above the sewage therein may flow past the valve without closing it as the sewage rises in the tank. After the pressure has been admitted and the contents of the apparatus discharged and pipe 1 drained, ventilation or relief is secured and the valve *o* automatically opens. The upper part or section of the tank is made of smaller diameter than the lower part so as to make the height of the sewage more sensitive to an inflow; that is, so that the inflow will rise more rapidly in the section of small diameter than in the bottom part of larger diameter.

65 The improved apparatus will discharge hot water as readily as cold water and is not affected in its operation by any condition of

the matter which enters it to be ejected. The branch *L* connected with the pipe *F* and with the pipe *K* is a by-pass and is supplied with a valve, as *L*¹, convenient for admitting fluid under pressure to the top of the tank independently of the automatically acting valve *m*, in case it be necessary or desirable at any time to so admit it. Should the material rise above the strainer protected inlet to pipe 1, water will flow over into this pipe and its weight will be added to the contents of the pipe to influence the movement of the valve *m*. In addition to this a syphonic action will be produced in the top of the tank through the pressure pipe 1 to remove the water from the top of the tank.

The parts are arranged to be made easily accessible for necessary attention or repairs, and the device constructed and arranged for operation in accordance with the foregoing explanations will be found to answer all the purposes or objects of the invention hereinbefore alluded to.

It will be observed that the float *G* is not employed to directly govern the valve controlling the steam or air supply but is only utilized to control the relief of the apparatus, which is a comparatively light and simple duty to perform.

Having now fully described my invention, what I claim as new herein and desire to secure by Letters Patent, is:

1. In a sewage ejector provided with means for automatically admitting fluid under pressure, said means being operated by liquid from the upper part of the tank, the tank being provided with an upper extension of smaller diameter than the lower portion and with inlet and outlet for sewage connected with the lower portion, the parts being combined and arranged substantially as set forth.

2. In a sewage ejector, the combination with the receiving tank and the inlet for fluid under pressure, of a controlling valve, a diaphragm connected therewith, and a pipe leading from the upper part of the tank and to one side of the diaphragm for conveying liquid from the tank to operate the diaphragm for the purposes set forth.

3. In a sewage ejector, the combination with the receiving tank and the inlet for fluid under pressure, of a valve for governing said fluid, a diaphragm connected with the valve, a pipe leading from the upper part of the tank and to one side of the diaphragm for conveying liquid from the tank to operate the diaphragm, and a spring for holding the valve normally to its seat, substantially as and for the purposes set forth.

4. In a sewage ejector, the combination with the receiving tank and means for automatically admitting fluid under pressure, of a ventilating pipe connected by branches with the top of the tank, with the discharge outlet

at the bottom of the tank, and with a branch on the pressure pipe leading from the upper part of the tank, substantially as and for the purposes set forth.

5 5. In a sewage ejector having means for automatically admitting fluid under pressure, said means being operated by liquid from the upper part of the tank, the combination with the ventilating pipe commu-
10 nicating with both the upper and the lower portions of the tank, of a valve in the ventilating pipe, and a float within the tank for automatically opening said valve when the material has been sufficiently discharged from the
15 tank, for the purposes set forth.

6. In a sewage ejector, the combination with the receiving tank and means for automatically admitting fluid under pressure, said means being operated by liquid from the upper part of the tank, of a ventilating pipe 20 communicating with both the upper and the lower portions of the tank, and a valve in the ventilating pipe, said valve being arranged to be closed by admission of the pressure fluid to the tank, substantially as set forth.

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