No. 655,479. Patented Aug. 7, 1900.

W. DE MONT & C. L. GARWICK.

CISTERN CLEANER.

(Application filed Dec. 20, 1899.)

(No Model.)

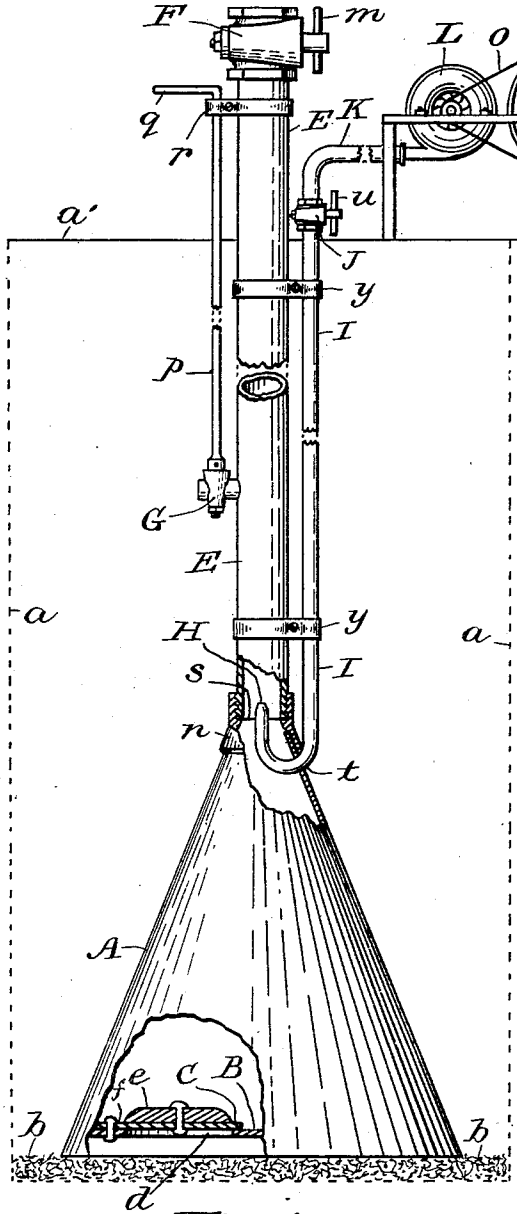


Fig. 1.

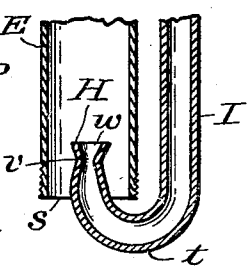


Fig. 2.

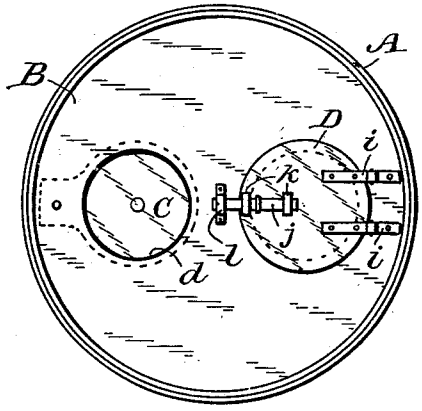


Fig. 3.

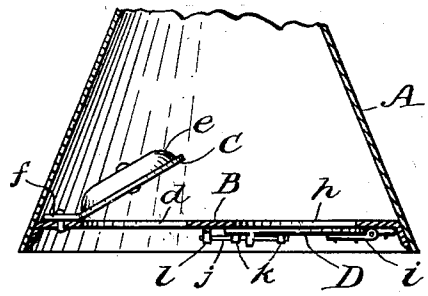


Fig. 4.

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UNITED STATES PATENT OFFICE.

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CISTERN-CLEANER.

SPECIFICATION forming part of Letters Patent No. 655,479, dated August 7, 1900.

Application filed December 20, 1899. Serial No. 741,014. (No model.)

To all whom it may concern:

Be it known that we, WYCKOFF DE MONT, residing at Lafayette, in the county of Tippecanoe and State of Indiana, and CHARLES L. GARWICK, residing at Morrison, in the county of Whiteside, State of Illinois, citizens of the United States, have invented certain new and useful Improvements in Cistern-Cleaners; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Our invention relates to the class of devices whereby cisterns and wells may be cleaned or the sediment and debris removed therefrom without requiring the removal of the water therefrom; and one of our objects is to provide cleaning apparatus of this character which may be cheaply constructed and not liable to get out of order either in operation or when not in use and which may be depended upon to perform its functions effectually in control of unskilled labor.

A further object is to provide that the supply of water in a cistern be improved in the operation of removing the sediment by aerating the water somewhat, so as to remove the stale odor usually found in water that has been still and inclosed for some time.

These objects are attained in our invention and illustrated and described herein.

The invention consists in a receptacle for the debris having an air-outlet pipe provided with an overflow-aperture through which to discharge into the cistern all water that is forced with the air into the air-outlet pipe, an air tube or duct and a discharge-nozzle delivering into the air-outlet, whereby the debris is drawn into the receptacle, and an air-compressor connected to the air-tube; and the invention consists in the parts and combination and arrangement of parts hereinafter particularly described, and pointed out in the claims.

Referring to the drawings, Figure 1 represents an apparatus constructed in conformity to our invention and showing the same in operative position in connection with a cistern or the like, which is indicated by dotted or broken lines, but small in proportion to the device therein; Fig. 2, an enlarged vertical central sectional view of a fragment of the air-outlet pipe and nozzle; Fig. 3, a bottom plan view of the receptacle for raising the debris, and Fig. 4 a fragmentary vertical central sectional view of the lower part of the receptacle for debris.

In the drawings similar letters of reference in the several views designate like parts.

Our invention is formed of suitable metal and other material that is best adapted for the purpose in economically performing their several functions. The receptacle-body A is preferably conical in form, the larger end of which has a bottom B attached tightly thereto, preferably somewhat raised above or set within the extremity of the body. The bottom B has an aperture *d*, forming a valve-opening, at the top of which a valve C is mounted, a suitable form consisting of a leather disk having a projection secured to the bottom, as at *f*, and having a weight *e* secured to the disk portion, this type being familiar. In lieu of this, however, we may employ other types of valves. The bottom B has also another aperture *h*, through which to remove the sedimentary matter when drawn from the cistern, and it is covered by a door D, arranged at the outside of the bottom and secured thereto by hinges *i i* and a sliding bolt *j*, working in keepers *k k*, secured to the door and engaging an eye *l*, attached to the bottom. The apex of the conical body portion has an aperture, and to this end—the top in practice—is connected the air-outlet pipe E, preferably through the means of a cast piece *n*, riveted to the body portion and having the pipe end *s* screwed into the top of it. The air-outlet pipe E is of suitable length to extend to a convenient height above the top *a'* of the cistern and may comprise detachable sections, and at the top it is provided with a valve or, preferably, a plug-cock F, having a lever-handle *m*, to insure rapid manipulation. Such a receptacle and air-outlet pipe are old and well known in themselves and, as described, perform the desired functions but indifferently.

In order to attain the desired results, we provide means whereby a strong suction is produced under control of the operator, and which shall not only draw the objectionable matter into the receptacle, but shall cause the water to become mixed with fresh atmospheric air, so as to purify the water and assist it to settle after the disturbance by reason of the aeration thereof. To illustrate the principle upon which we accomplish our ends, we show a nozzle H of simple form, having its orifice directed in a direction to discharge its contents into the pipe E, somewhat within the end *s* thereof, there being a free passage around the nozzle into the pipe. The nozzle may be cast with the piece *n*, if desired, or it may be formed integrally at the end of the air-supply pipe I, having a return-bend *t* and entering the receptacle through a suitable aperture. This air-supply duct may be formed cheaply of iron pipe and attached to the pipe E by means of bolted clamps *y y*, and it is provided at or near the top thereof with a valve or plug-cock J, having a lever-handle *u* and connected to a suitable length of rubber hose K, capable of sustaining the desired degree of air-pressure. When air is forced from the nozzle H, some of the water in the cistern will be drawn up into the pipe E and become mixed with air, and in order to permit this to return to the cistern we provide overflow-apertures in the pipe E at a suitable height, such apertures being preferably controlled by means of one plug-cock G or more, as may be desired, so that in some cases the aperture may be closed, the cock having a valve-rod *p* connected therewith, working in a guide-bracket *r*, bolted to the pipe E and provided with a lever-handle *q* at the top of the rod. In some cases the air may be forced to escape with the water through the overflow G, but it is usually permitted to pass through the cock F.

Governed by the amount of air-pressure employed, by the sizes of apparatus, and other conditions, we may vary the construction of the nozzle H and the lower end of the pipe E in order to produce the best form of ejector, as the nozzle may be of the plain form having a restricted orifice, or it may be of the type shown in Fig. 2, having a restricted part *v* and a flaring enlarged orifice *w*, so as to cause the air to impinge with most force against the wall of the pipe E near the bottom thereof or in proximity to the nozzle.

Obviously we may employ compressed air from any convenient source; but in rendering our apparatus entirely independent and portable we may employ either a lever-pump or a rotary blower L, suitably operated, as by a belt-wheel M, having a belt O and crank N and mounted on a suitable frame P. When a continuous pressure is produced and it is desired to cause intermittent discharges of air from the nozzle, it may be produced by manipulation of the cock J.

In some cases we may depend only upon the use of compressed air for drawing in the debris after the receptacle is placed in position in the cistern, in which case the cock G in the overflow-aperture may be dispensed with, as well as the cocks F and J, thus reducing the expense of construction to that extent without detracting from the utility of the apparatus, but requiring simply a trifle more effort in supplying the additional quantity of air thus required.

In practical use the door D, the valve C, and the cocks F, G, and J are closed, thus hermetically sealing the receptacle and ducts thereto, when the receptacle is in condition for inserting into the cistern or well to be filled with the refuse therein. Generally, however, in order to realize the best action it is desirable and may even be necessary to first admit a quantity of compressed air into the inclosure by means of the blower or compressor through the cock J. The pipe E is then handled manually and the receptacle let down, bottom foremost, into the cistern *a a* until in contact, or nearly so, with the sediment *b* at the bottom thereof, when the cock F (and also in some cases the cock G) is opened quickly, permitting the air to escape suddenly, the action causing the valve C to be released and the sediment to flow into the receptacle, the latter being then moved about until sufficiently full to require being disgorged. In order, however, to secure a full load, and thus save much time in the opation, a stream of air is forced through the pipe I and nozzle H, causing a powerful "suction," as it is usually termed, being a partial vacuum in the receptacle and inducing a further inflow of sediment, the water entering therewith escaping through the overflow G and mixed with fresh air and falling back into the cistern, from whence the air gradually rises and aids in purifying the native atmosphere above the water-surface. The receptacle is then raised, the valve C closing in the act, and the contents are removed and the operations repeated until the cistern is thoroughly cleaned, its water improved in quality, and its atmosphere purified—a result highly important and much desired, while heretofore unattainable with so little labor and expense.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A cistern-cleaner provided with an ejector comprising an air-outlet duct, a nozzle discharging into the outlet-duct, and an air-supply duct communicating with the nozzle.

2. A cistern-cleaner including a receptacle whereinto the debris may be drawn, an air-outlet pipe duct communicating with the receptacle, a nozzle situate within the air-outlet duct, and an air-supply duct communicating with the nozzle.

3. A cistern-cleaner consisting of a receptacle for debris, an air-outlet duct provided with an overflow-aperture, and an air-sup-

ply duct provided with a nozzle situate within the air-outlet duct.

4. A cistern-cleaner comprising a receptacle having a closed bottom provided with an inlet-valve and an aperture covered by a hinged latched door, an air-outlet duct communicating with the top of the receptacle and provided with a water-overflow aperture in the body portion thereof, a nozzle having its discharging-orifice directed into the air-outlet pipe, an air-supply duct communicating with the nozzle, and an air compressor or blower communicating with the air-supply duct.

5. A cistern-cleaner comprising a receptacle for debris, an air-outlet duct, an overflow-aperture for water, an ejector whereby a partial vacuum may be formed in the receptacle, and an air compressor or blower communicating with the ejector.

6. A cistern-cleaner comprising a debris-receptacle having an inlet-valve and a discharging-door hinged to the bottom of the receptacle, an air-outlet duct attached to the top of the receptacle and provided with an overflow-aperture, a valve connected with the overflow-aperture, an operating-rod attached to the valve at the overflow-aperture, means for closing the air-outlet duct, a nozzle having its discharging-orifice delivering into the lower end of the air-outlet duct, an air-supply duct communicating with the nozzle and provided with a cut-off valve, and an air compressor or blower communicating with the air-supply duct.

7. In a cistern-cleaner, the combination with the receptacle having the air-outlet duct and the means for closing the same, of an overflow-aperture situate between the receptacle and such closing means whereby water may escape from such receptacle, and a valve at the overflow-aperture whereby the same may be closed to retain air in such receptacle.

8. In a cistern-cleaner, the combination with the receptacle having the air-outlet duct and the inlet-valve for debris at the bottom of such receptacle, of a nozzle situate at the lower portion of such air-outlet duct and delivering thereto, an air-supply duct communicating with the nozzle, and means for furnishing compressed air to the air-supply duct, whereby a partial vacuum may be formed in such receptacle.

In testimony whereof we affix our signatures in presence of two witnesses.

WYCKOFF DE MONT.
CHARLES L. GARWICK.

Witnesses:
WM. H. PAYNE,
E. T. SILVIUS.