

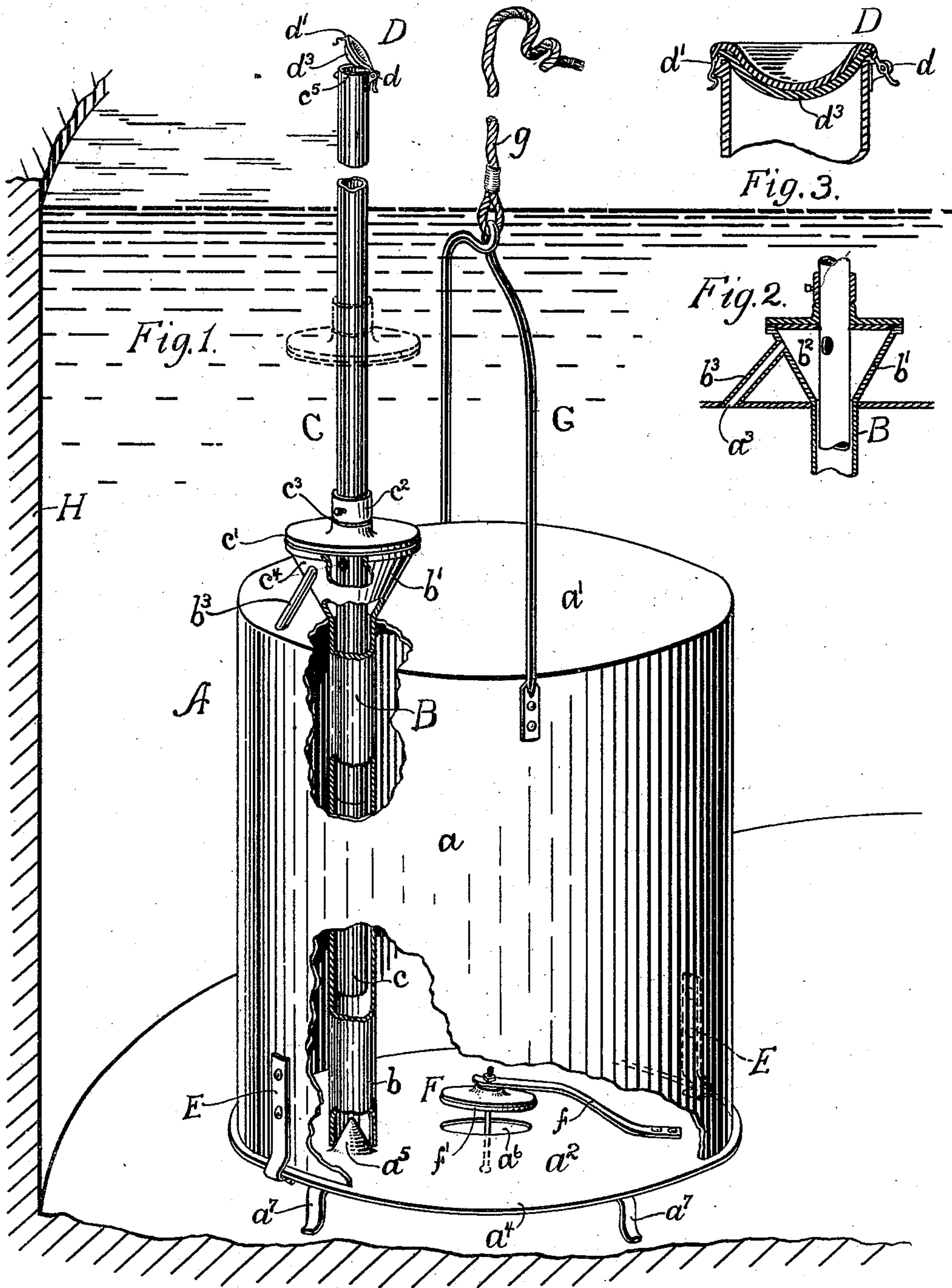
(No Model.)

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APPARATUS FOR CLEANING RESERVOIRS, CISTERNS, &c.

No. 550,023.

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Witnesses

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APPARATUS FOR CLEANING RESERVOIRS, CISTERNS, &c.

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To all whom it may concern:

Be it known that I, ALVA S. MERRIETT, a citizen of the United States, residing at Kansas City, in the county of Wyandotte and State of Kansas, have invented certain new and useful Improvements in Apparatus for Cleaning Reservoirs, Cisterns, &c.; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

My invention has for its object, first, to draw the impurities from the bottom of a well, cistern, or other reservoir within a receiver and elevate and discharge the contents of the receiver, alternately; second, to control the action of the compressed air within the receiver and thus prevent the admission of the impurities until the proper time; third, to prevent the impurities from entering the air-chamber when the receiver is being filled; fourth, to enable the receiver and its pipe to be removed separately from the cistern or well and the formation of an air-chamber in the conjunction of the separate parts.

My invention further consists in the novel construction and combination of parts, such as will first be fully described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a vertical sectional view of a cistern, showing the cistern-cleaning apparatus at the bottom with portions of the side and top taken away, and showing the various parts in the position to permit of the escape of the compressed air and the entrance of the impurities to be removed, also showing in dotted lines the position of the air-pipe and valve to the air-chamber partially removed from the receiver. Fig. 2 is a detail sectional view of the air-chamber and the air-tube. Fig. 3 is a detail view of the valve closing the upper end of the air-discharging pipe.

Referring to the drawings, A represents the receiver, which consists of a cylindrical air-tight vessel of suitable dimensions to be raised with its contents from and also forced beneath the surface of the water, and in which a represents the exterior side portion. a' is the top, and a^2 is the bottom of the receiver, both of which are flat surfaces. Through a

suitable opening in the top a' of the receiver, a short distance from the side a , toward the central portion of the said top is inserted one end of a tube B, the lower end b of which extends in a downward direction to and rests upon the inner side portion of the bottom a^2 of the receiver. The upper end b' of the tube B, which extends above the upper surface of the top a' , is distended in the shape of and consists of a funnel b' , the orifice in the top a' through which the tube B passes being soldered, so as to prevent the escape of air. In the side of the funnel b' , near the upper circular edge, is an opening b^2 . In the top a' of the receiver, near the outer edge, is an opening a^3 . In the outer side portion of the funnel b' is connected one end of a short air-tube b^3 , which extends round the opening b^2 and is soldered in place, so as to exclude the air. The other end of the tube is connected with the top a' and extends around the opening a^3 , and is also made to exclude the air in the same manner.

Within the tube B is fitted, so as to be readily drawn out, the lower end of an air-conducting tube C. Said lower end c of the tube C extends to within a short distance of the bottom a^2 of the receiver. Upon said tube C, above the funnel b' , is a circular cap or valve c' , which extends in a horizontal position from the sides of said tube. Upon the valve or cap c' and extending around the tube C is a collar c^2 , which is attached to said tube by means of a screw c^3 . In the tube C, a short distance beneath the cap a' , is a perforation c^4 , which communicates with the funnel or air-chamber b' . The upper end portion of the pipe C extends from the receiver A to the top of the reservoir and as far above as is necessary to permit of the discharge of the water. Said pipe is made extensible in the usual manner by screwing the separate parts together. Upon the extreme upper end of the pipe C and upon the outer side is a circular flange c^5 . To the side of the pipe, a slight distance below the flange c^5 , is hinged at d a cap D. Upon the other side of the cap D from hinge d is attached a cam d' , which is provided with an operating-lever d^2 . Upon the under side portion of the cap D is attached a rubber or elastic stopple d^3 , which enters the opening in the upper end of the pipe C and fits snugly therein.

The bottom a^2 of the receiver is detachable and is provided with a flange a^4 , extending in a vertical direction from the inner side portion of the said bottom a short distance and also in a circular direction and in contact with the inner side portion of the side a of the receiver. The said bottom a^2 of the receiver is secured from accidental removal by means of the spring-catches E E, each one of which is bolted to the outside portion a of the receiver and extends in a downward direction, and bent over the edge of the bottom a^2 . Upon the upper side portion of the bottom a^2 is a cone-shaped plug a^5 , which enters the lower end of the pipe B and prevents the lateral movement of the lower end of the pipe B. In the central portion of the bottom a^2 is a circular opening a^6 , over which is an ordinary self-closing valve F. Said valve F is provided with a hinge f , which is attached to the upper side of the valve F at one end and to the upper side portion of the bottom a^2 at the other. To the under side portion of the valve F is attached firmly a pin f' , which extends in a downward direction a considerable distance. To the under side portion of the bottom a^2 is attached rigidly a downwardly-extended support a^7 , and at suitable points on said bottom a^2 are other foot-supports a^7 of corresponding length, the pin f' on the valve F extending a greater distance in a downward direction upon the ends of the foot-supports a^7 .

To one side of the receiver A, near the top a' , is attached rigidly one end of the bail G, the other end of which bail is extended in an upward direction a considerable distance and then bent in a curved line over the said receiver and the other end attached rigidly to the other side of said receiver. To the bail G is attached one end of a rope g , which also extends in length the depth of the cistern and by means of which the receiver is raised from the cistern. The receiver A, as shown in the drawings, is within a cistern H and resting upon the bottom h of said cistern.

In the operation of my improved cistern-cleaning apparatus the depth of the fluid in the cistern to be cleaned is first ascertained, which should be sufficient to immerse the receiver A and extend above the chamber b' . The receiver is then prepared for the work of cleaning the cistern by the introduction of the pipe C within the funnel b' , thence into the tube b , and so far within that the cap c' will fit closely upon the top of the funnel or air-chamber b' and upon the gasket c' and form an air-tight joint. The valve F in the bottom a^2 is then closed over the opening a^6 in the bottom of the receiver and the cap D upon the upper end of pipe C also closed and locked by means of the cam d' . The receiver A, which is now filled with air, is then lowered by means of the rope g into the cistern until the said receiver reaches the water and force is applied to the pipe C and the receiver pushed to the bottom h of the cistern until the foot-supports a^7 rest upon the said bot-

tom a^2 , in which position the pin f' of valve F raises the valve in position, as seen in Fig.

1. The air within the receiver being compressed resists the entrance of the water. The valve D at the upper end of pipe C is then opened, and the compressed air escapes from the receiver through the air-tube b^3 into the air-chamber b' , thence through the perforation c^4 in the pipe C, and the air immediately rushes out of the said pipe C and with considerable violence, and the water rushes in at the bottom of the receiver through the opening a^6 , which causes a suction upon the surface of the bottom of the cistern H beneath the receiver within a considerable distance from the said receiver A, and the soil and the impurities upon the bottom h are drawn within the receiver with the inflowing water, and as soon as the water has entered and filled the receiver the pipe C is withdrawn from the receiver A and permitted to remain in the cistern and the air-chamber is opened. The receiver A is then raised from the bottom of the reservoir by drawing upward upon the rope g , in which movement the valve F is closed and the receiver, with its contents, removed from the cistern. The spring-catches E E are drawn outwardly and the bottom a^2 falls out under the weight of the mass of soil and impure water. As soon as the receiver is cleared from the impurities, the bottom a^2 and pipe C are replaced and the operation repeated. The receiver will empty itself by placing same upon the ground, whereby the valve is opened. The tube C is extended through the top of the reservoir and to the inner side of the bottom of said receiver for the purpose of preventing strain upon the receiver and to enable the operator to overcome the resistance to the receiver in forcing the same below the surface of the water and to the bottom of the cistern, also to enable the tube to be immediately withdrawn from the receiver and facilitate the removal of the receiver from the cistern. In connection with the funnel b' and the air-tube the discharge of the water is permitted from the tube C without clogging the tube with the soil which enters the receiver in the opening of valve F.

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

1. In a reservoir cleaning apparatus an air receiver having an opening in the lower portion thereof for the admission of the fluid impurities to be removed from said reservoir, and a self opening valve to said opening, a tube extending through the upper portion of said receiver and within said receiver and an air chamber upon the outside of said receiver connected with said tube, and having a detachable valve and an air discharging pipe extending through and connected with said valve upon said air chamber and also extending within said tube, and having a valve for controlling the escape of the air and a con-

ductor for the air connected with said air chamber and the said receiver and an aperture in said pipe beneath said valve for the purpose described.

- 5 2. In a reservoir cleaning apparatus an air receiver, having an opening in the lower portion thereof for the admission of the fluid and other impurities to be removed from the reservoir and a self opening valve to said opening, a tube extending through the upper portion of said receiver and within said receiver and an air chamber upon the outside of said receiver connected with said tube having a
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detachable valve, an air discharging pipe extending through and connected with said valve and telescoping with said tube and provided with an aperture beneath said valve an air conducting pipe connected with said air chamber and also with said receiver, and an elevating device connected with said receiver for the purpose described.

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