No. 784,583. PATENTED MAR. 14, 1905.

T. S. MURRAY.

CISTERN CLEANER AND WATER PURIFIER.

APPLICATION FILED JULY 7, 1904.

3 SHEETS—SHEET 1.

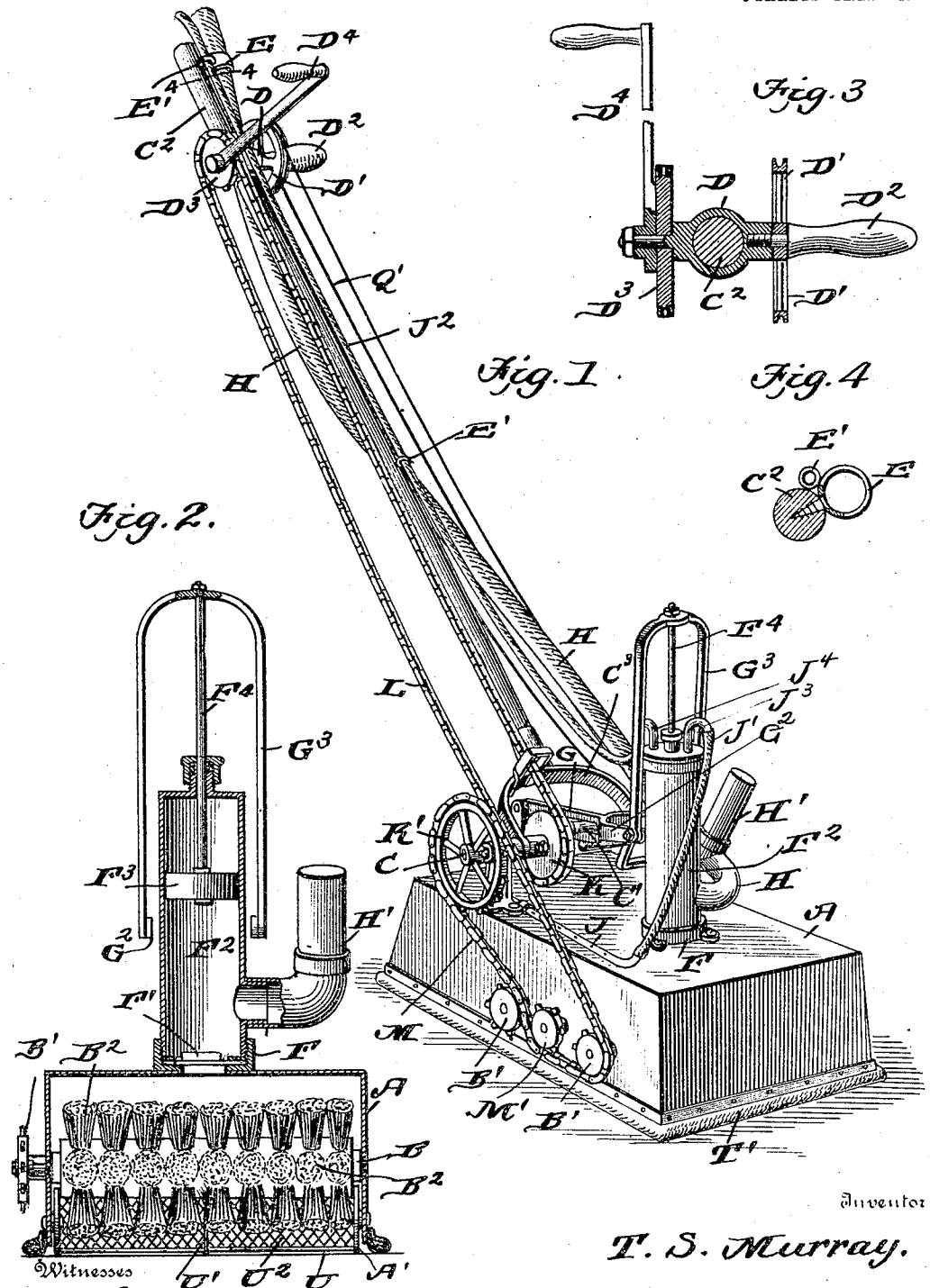

Fig. 1.

Fig. 3

Fig. 4

Fig. 2.

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3 SHEETS—SHEET 2.

Fig. 5.

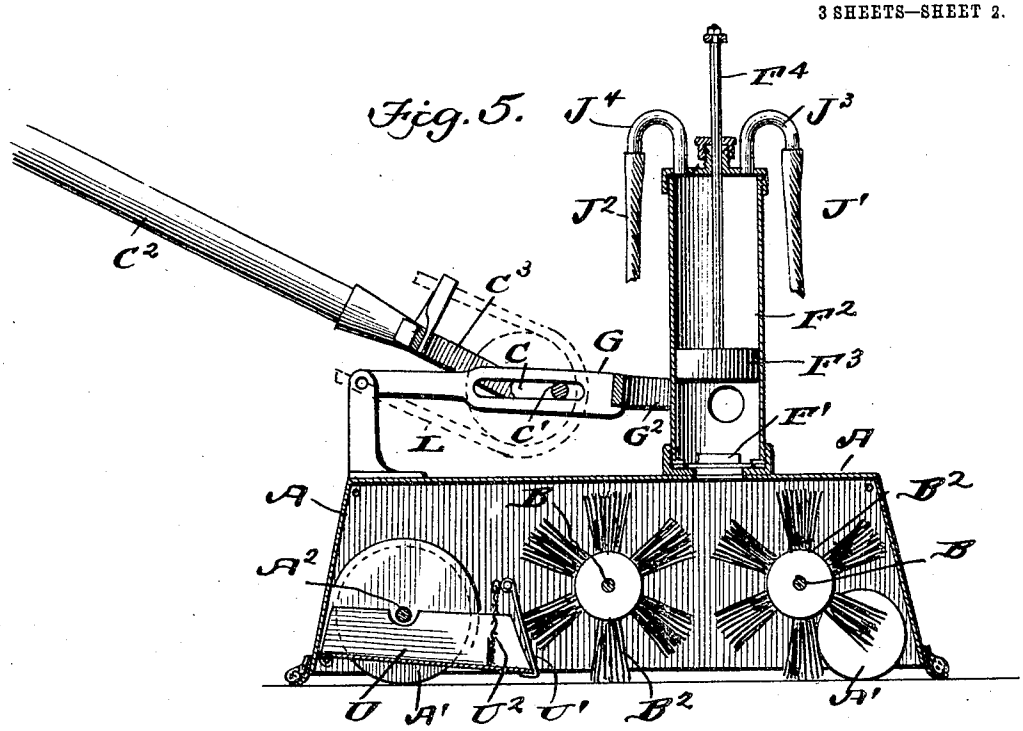
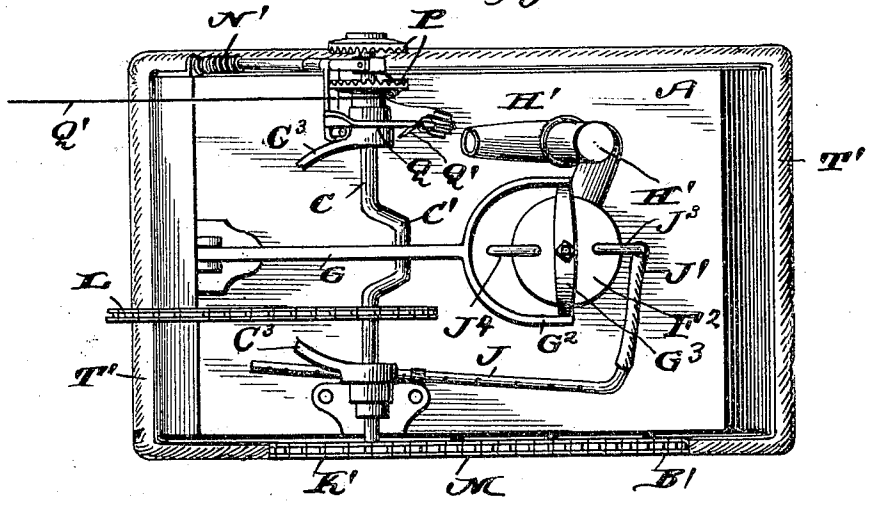


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 7.

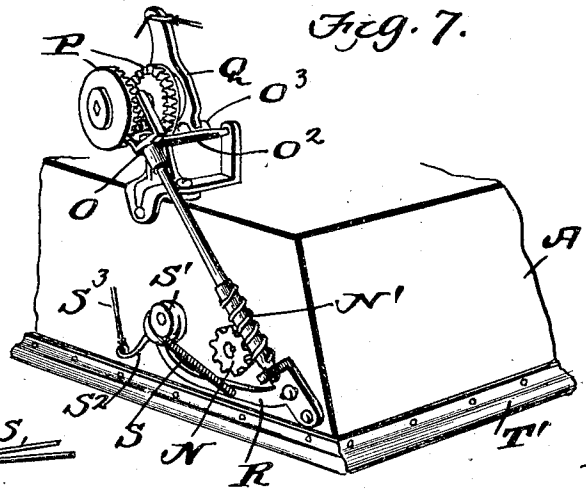


Fig. 8

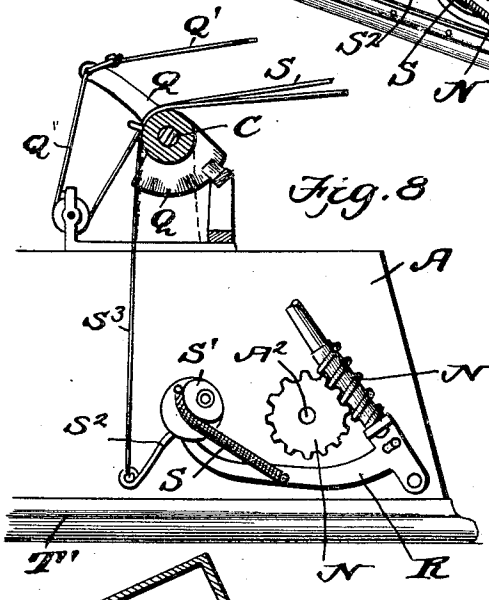


Fig. 9

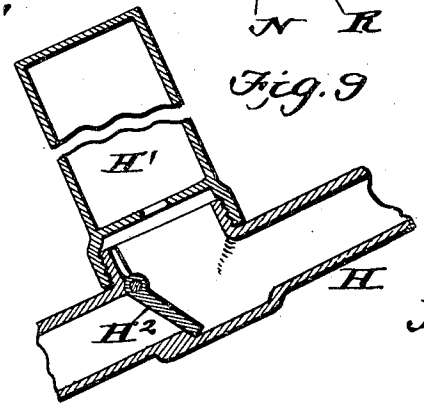


Fig. 10

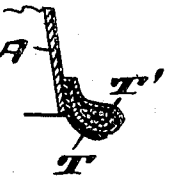


Fig. 11.

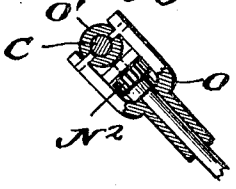


Fig. 12

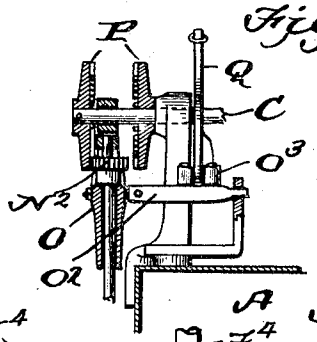
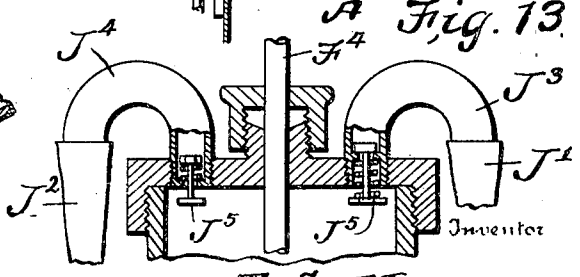


Fig. 13.



Witnesses

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No. 784,583. Patented March 14, 1905.

UNITED STATES PATENT OFFICE.

THOMAS S. MURRAY, OF ARKANSAS CITY, KANSAS.

CISTERN-CLEANER AND WATER-PURIFIER.

SPECIFICATION forming part of Letters Patent No. 784,583, dated March 14, 1905.

Application filed July 7, 1904. Serial No. 215,667.

To all whom it may concern:

Be it known that I, THOMAS S. MURRAY, a citizen of the United States, residing at Arkansas City, in the county of Cowley and State of Kansas, have invented a new and useful Improvement in Cistern-Cleaners and Water-Purifiers, of which the following is a specification.

This invention has for its object a device for cleaning cisterns and purifying the water therein by means of a simple appliance adapted to be easily rolled upon the bottom of the cistern, removing the sediment therefrom and purifying the water therein.

A further object of the invention is to separate the water and the sediment, and the filtration, aeration, and consequent purification of the water, and the return of the same to the cistern or to some other receptacle, whereby the cistern is cleansed without waste of the water therein.

With these objects in view the invention consists in the novel features of construction and combination of parts hereinafter described, particularly pointed out in the claims, and shown in the accompanying drawings, in which—

Figure 1 is a perspective view of my device complete. Fig. 2 is a detail vertical section through the brush-casing and the cylinder, parts being in elevation. Fig. 3 is a detail sectional view of the handle portion. Fig. 4 is a section through the handle on the line 4 4 of Fig. 1. Fig. 5 is a section through the brush-containing casing and the cylinder at right angles to the section shown in Fig. 2. Fig. 6 is a plan view of the casing shown in Fig. 5. Fig. 7 is a detail perspective view of one side and corner of the casing, showing in perspective the parts carried thereby. Fig. 8 is a side elevation of the parts shown in perspective in Fig. 7, parts being shown in section. Fig. 9 is a detail sectional view through the discharge-pipe and air-chamber. Fig. 10 is a detail sectional view of the packing around the lower edge of the casing. Figs. 11 and 12 are detail views, partly in section, illustrating a clutch mechanism. Fig. 13 is a detail view, partly in section, of the upper end portion of a cylinder, puppet-valves being shown in elevation.

In constructing the device I employ a downwardly-open casing A, mounted on wheels A′, and in the casing are arranged shafts B, having at one end and exterior of the casing sprocket-wheels B′. Within the casing the shafts B carry brushes B^2, adapted to rotate in opposite directions, as will hereinafter appear. Mounted upon the casing and journaled in suitable brackets is a shaft C, cranked as at C′, and a yoke C^3 of a handle C^2 is mounted on the shaft C, the shaft passing loosely through the end portions of the yoke. The handle or pole C^2 may be of any desired length and for use with deep cisterns may be formed in sections jointed or otherwise detachably connected. Adjacent its upper end the handle C^2 carries a sleeve D, which extends upon each side of the handle and has bearings formed thereon, and on one of these bearings is journaled a pulley D′, and adjacent the pulley the sleeve D carries a horizontally-extending handle or handhold D^2, and on the opposite side of the pole C^2 the sleeve carries a sprocket-wheel D^3, adapted to be actuated by a crank-handle D^4. Above the sleeve the pole C^2 has eyes E and E′ secured therein, the eye E being of greater diameter than the eye E′. The casing A has an opening formed in its top, over which is arranged a socket F, having an opening alining with that in the casing, the openings being closed normally by an upwardly-opening valve F′, and a cylinder F^2 has its lower end threaded into the socket F. In the cylinder F^2 works a plunger F^3, having connected thereto an upwardly-extending plunger-rod F^4. The cylinder F^2 is arranged adjacent one end of the casing A, and adjacent the opposite end is pivoted a lever G, having an intermediate slotted portion G′, through which extends the cranked portion of the shaft C, and the forward end of the lever G carries a preferably integral segment G^2, and to the ends of the segment are pivoted the ends of a bail G^3, the bow portion of the bail being connected to the upper end of the plunger-rod F^4. From the side of the cylinder adjacent its lower end extends a discharge-pipe H,

which extends upwardly, being passed through and supported by the eye E. The lower portion of the discharge-pipe may be of metal with hose connection, and the metal portion carries a laterally-extending cylindrical air-chamber H′, communicating with the discharge-pipe H and in the pipe H adjacent the air-chamber, and between the air-chamber and the casing or lower end of the discharge-pipe is arranged a flap-valve H^2, adapted to permit discharge of sediment from the casing A, but preventing its return. On the top of the casing is arranged horizontally a perforated pipe-section J, and a flexible tube J′ extends from an end of the pipe-section to the top of the cylinder F^2 and is connected to a nipple J^3, carried by and opening downwardly into the cylinder. From the top of the cylinder F^2 there also extends an air-pipe J^2, carried by the eyes E′, placed on the handle C^2, the lower end of the pipe J^2 being connected to a nipple J^4, also carried by the top of the cylinder F^2. The nipples J^3 and J^4 are provided with a common form of puppet-valve J^5, the said valves being oppositely acting, whereby air is admitted into the cylinder F^2 through the pipe J^2 and nipple J^4 and discharged from the cylinder through the nipple J^3 and pipes J′ and J. Sprocket-wheels K and K′ are carried by the shaft C, and a sprocket-chain L runs over the sprocket-wheels D^3 and K. A sprocket-chain M runs over the sprocket-wheels K′ and B′ and over an idler M′, the object of the idler being to hold the chain M in engagement with the rear sprocket-wheel B′, the chain running over the wheels B′, so as to rotate them in opposite directions.

To actuate the traction-wheels and move the casing A over the bottom of the cistern, the shaft A^2 projects on one side and carries a gear-wheel N, which meshes with a worm-gear N′, the upper end of the worm-gear shaft carrying a pinion N^2 and being journaled in bearing carried by a yoke O. The shaft C carries gears P, adapted to be engaged by the pinion N^2. The yoke O is secured to a collar O′, sliding on the shaft C, and the yoke also carries a laterally-extending arm O^2, having rollers O^3 mounted thereon. A cam-lever Q is pivotally mounted on the shaft C, the cam edge of the lever working between the rollers O^3. As the lever is shifted backward and forward the pinion N^2 is caused to mesh with one or the other of the gears P, thereby causing the casing to move backward or forward, as may be desired.

The lower end of the worm-gear is journaled in a pivoted lever R. A spring S is connected at one end to the arm of the lever R and at the opposite end to an eccentric S′. A rod S^2 is connected at one end to the eccentric, and a cable S^3 extends from the free end of the rod S^2. The cam-lever Q is actuated by a double cable Q′, connected to the free end of the cam-lever and running over a pulley Q^2. A pull on one of the cables Q′ moves the lever Q in one direction, and a pull on the other cable Q′ moves the lever in the opposite direction. A pull on the cable S^3 lifts the worm-gear out of engagement with the gear-wheel N.

A strip of leather or other suitable packing is run along the lower edge of the casing, as shown at T, and is held down by a sack T′, carried by the lower edges of the casing and weighted with shot, limiting the inflow of water to an amount sufficient to thin the sediment to be pumped out. Within the receptacle is pivoted at the rear end a receptacle U, held in place by a hook U′ and having a screen U^2 forming its front end, the object of the receptacle being to catch and hold any large objects which might clog the valves of the discharge pipe or cylinder. By means of this device the bottom of the cistern or of any reservoir or tank may be run over and scoured, the water being aerated, the sediment pumped out, and objects too large to pass through the hose will be thrown by the rear brush into the receptacle U and held there until the casing has been lifted from the cistern or tank. I therefore pump out but a small portion of water to clear and purify a cistern—a very desirable thing during drought or when the supply of water is limited.

The introduction of air into the water freshens it and gives it life, rendering it more palatable than water which has been standing undisturbed for a considerable length of time.

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

1. A device of the kind described comprising a downwardly-open, movable casing, a pump carried by and having communication with the interior of the casing, a discharge-pipe leading from the pump, a perforated pipe carried by the casing, a tube connecting the said pipe with the top of the pump-cylinder, and an air-pipe leading from the top of the pump-cylinder.

2. A device of the kind described, a casing downwardly open, brushes arranged within the casing and adapted to rotate in opposite directions, means for rotating the brushes, a cylinder on the casing having communication with the interior of the casing, a check-valve, a discharge-pipe leading from the lower portion of the cylinder, an air-chamber connected to the discharge-pipe, a flap-valve in the discharge-pipe between the air-chamber and the cylinder, a plunger in the cylinder, an air-pipe leading to the top of the cylinder, and an air-pipe leading from the top of the cylinder adapted to discharge air adjacent the casing, as and for the purpose set forth.

3. A device of the kind described comprising in combination a pole, a yoke, a casing, a crank-shaft on the casing, said shaft supporting the yoke, wheels supporting the casing, a

packing-strip carried by the lower edges of the casing, weights adapted to hold the packing in position, rotatable brushes in the casing, means for rotating the brushes, a receptacle in the casing adapted to retain matter carried thereto by the brushes, a pump carried by the casing and adapted to pump water from the casing, aerating-pipes connected to the pump-cylinder, and a discharge-pipe carried by the pump-cylinder.

4. A cistern-cleaner comprising a downwardly-open casing having rotatable brushes arranged therein and mounted upon suitable wheels, a pump mounted on the casing, said pump comprising a cylinder having communication at its lower end with the interior of the casing, a discharge-pipe leading from the lower portion of the cylinder, a plunger working in the cylinder and air-pipes leading to and from the top of the cylinder, all for the purpose set forth.

5. A device of the kind described comprising a downwardly-open, wheeled casing, a leather packing-strip extending along the lower edge of the casing, a pump carried by the casing, brushes arranged in the casing, means for rotating the brushes, and means for moving the casing backward and forward independent of the brush-rotating and pumping means.

6. A cistern-cleaner comprising a casing, a shaft thereon, a pole-handle, wheels on the casing, a gear-wheel carried by the casing adapted to impart rotation to the casing-wheels, a worm-gear adapted to mesh with the said gear-wheel, a collar on the first-mentioned shaft, crown gear-wheels carried by the said shaft, one on each side of the collar, a yoke pivoted to the collar, the upper end of the worm-gear shaft being journaled in said yoke, a pinion carried by the worm-gear shaft and adapted to mesh with the crown-gears, an arm carried by the yoke, rollers on the arm, a pivoted cam-lever adapted to work between said rollers and slide the yoke and collar, means for rotating the shaft carrying the crown gear-wheels, and cables connected to the lever and carried by the pole, as and for the purpose set forth.

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