

(No Model.)

E. S. HUTCHINSON.

PRESSURE FILTER.

No. 364,932.

Patented June 14, 1887.

FIG. I.

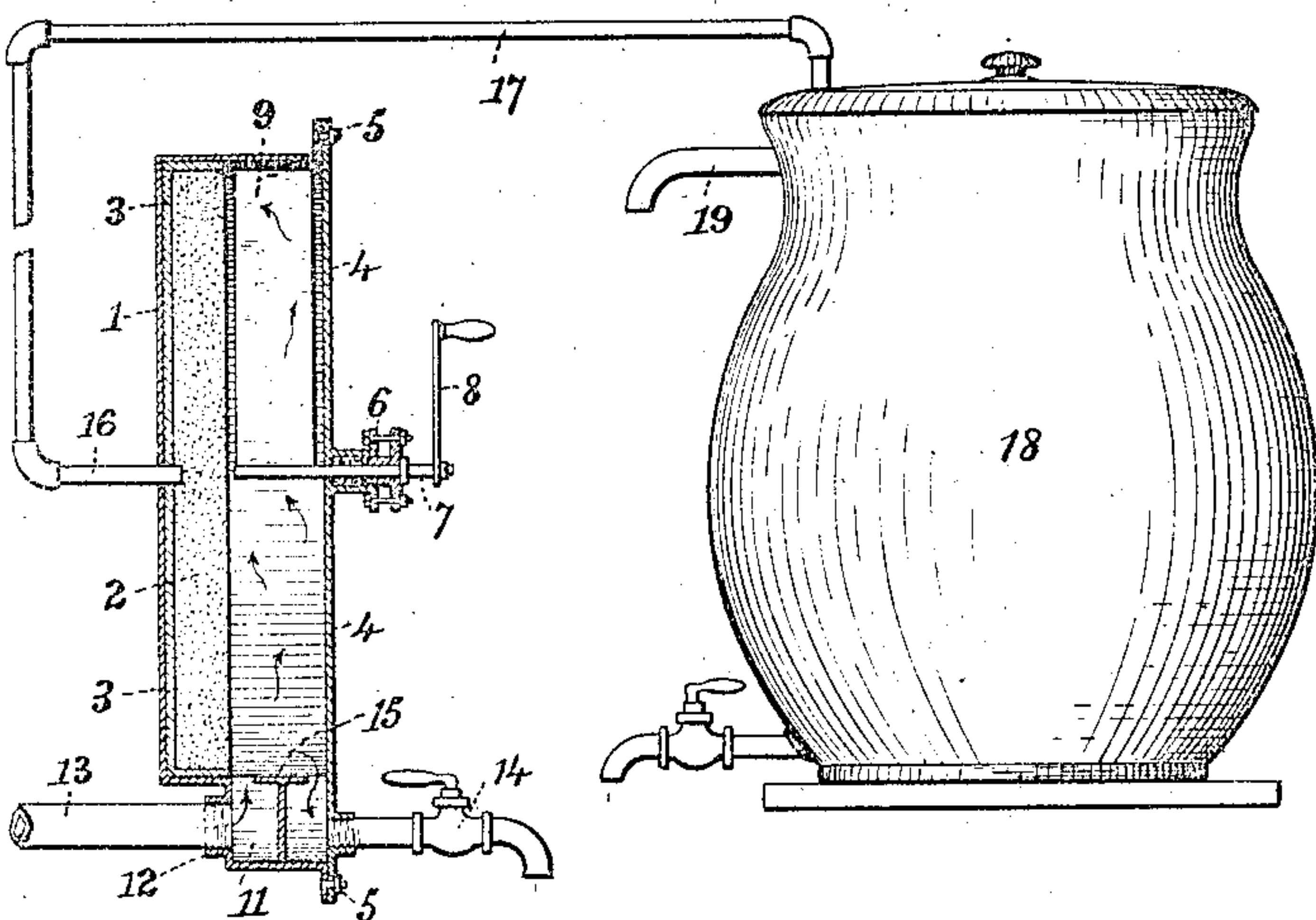
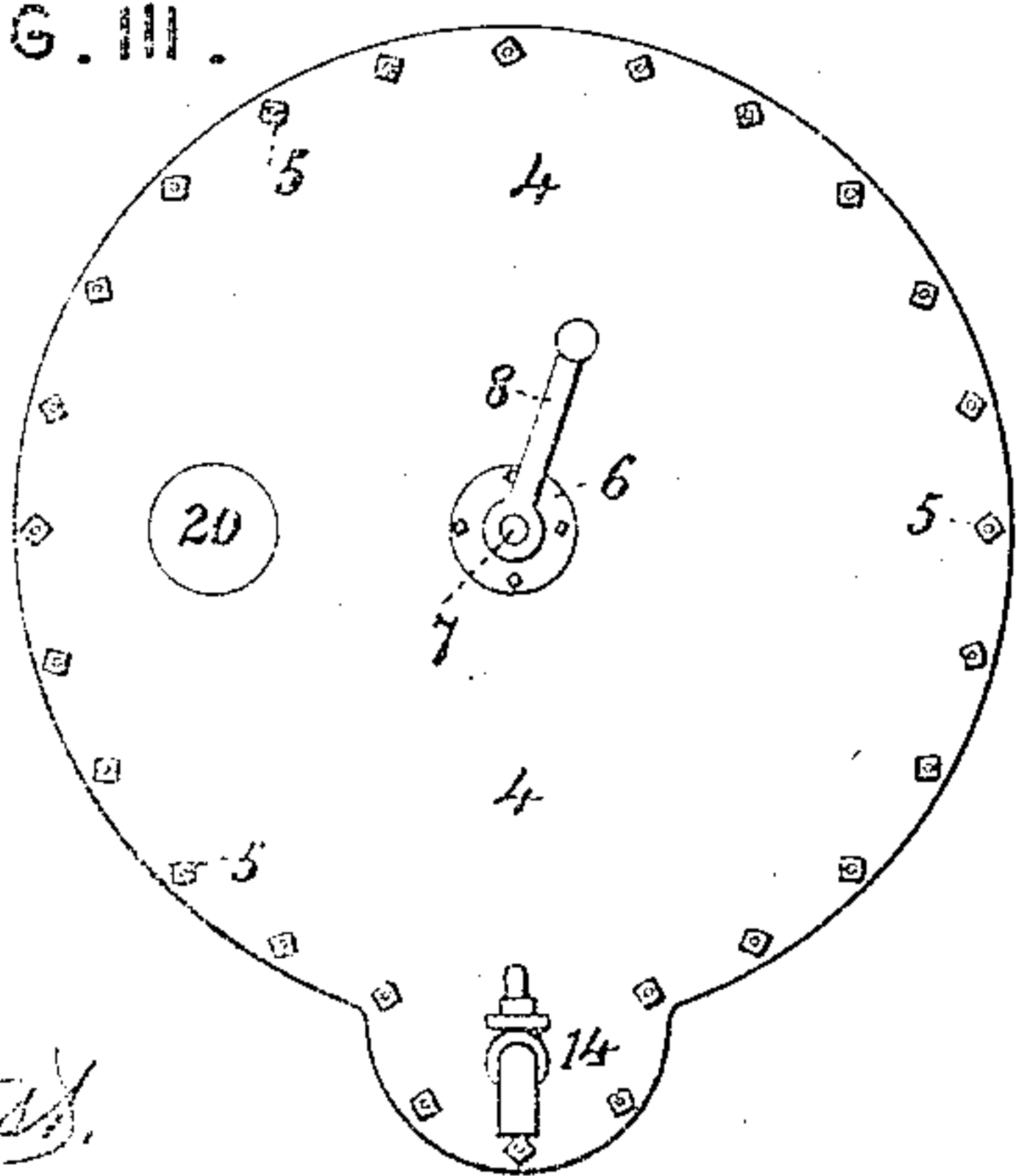
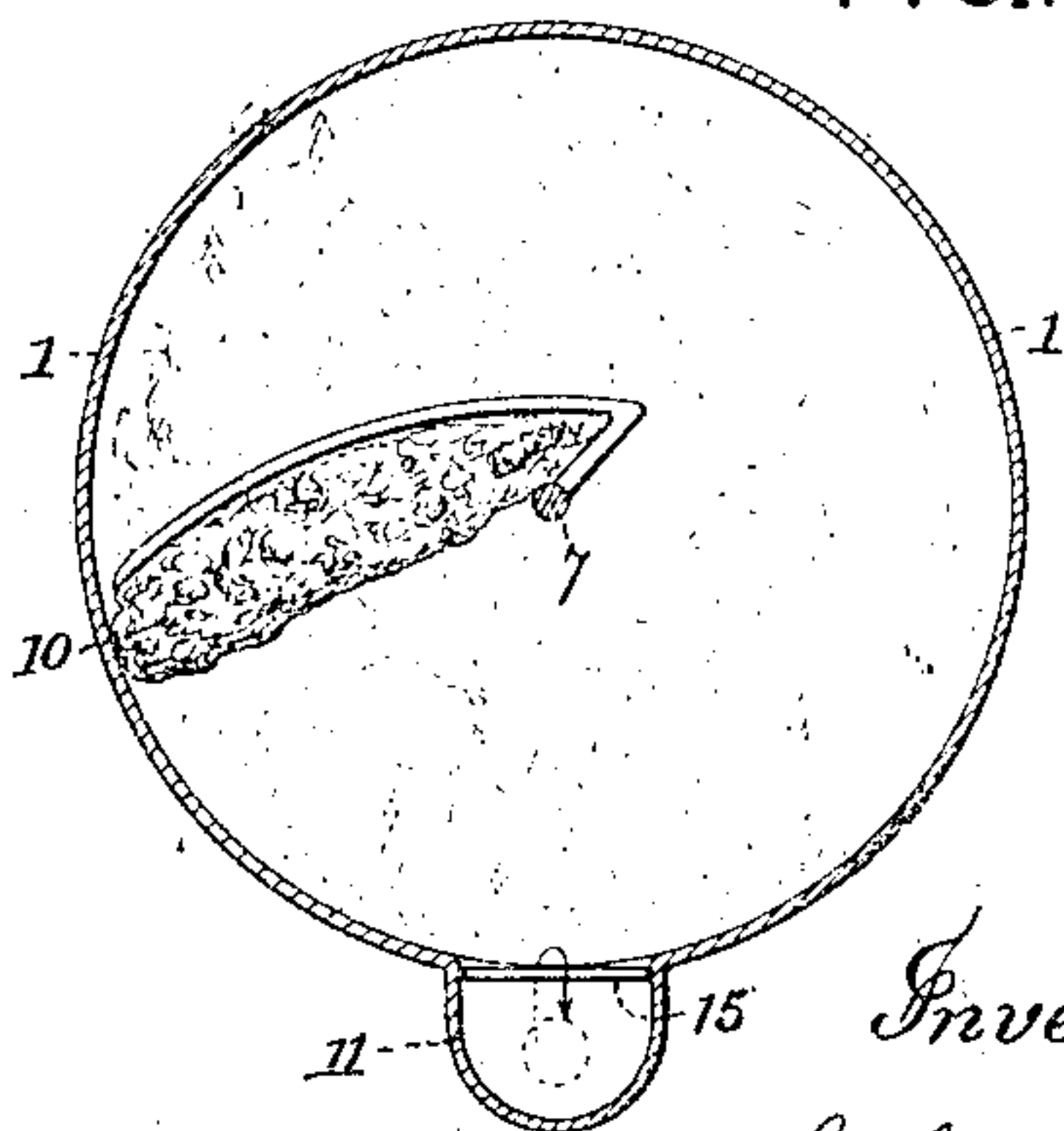


FIG. III.



Attested.
Geo. T. Smallwood.
Wm. H. Knight.

FIG. II.



Inventor:
Elias S. Hutchinson
By *Wm. H. Knight* *attys*

UNITED STATES PATENT OFFICE.

ELIAS S. HUTCHINSON, OF WASHINGTON, DISTRICT OF COLUMBIA.

PRESSURE-FILTER.

SPECIFICATION forming part of Letters Patent No. 364,932, dated June 14, 1887.

Application filed February 17, 1887. Serial No. 227,935. (No model.)

To all whom it may concern:

Be it known that I, ELIAS S. HUTCHINSON, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Pressure-Filters, of which the following is a specification.

The object of my invention is to provide a filter of practical construction, adapted for ready application to the service-pipe of a house, to deliver a constant supply of filtered water, to have the surface of the filtering medium cleansed and relieved of the accumulations with the greatest facility, and to pass a free supply of unfiltered water whenever this is required. To this end I provide a filtering-stone, tightly embedded in a metallic casing by means of cement, so as to form an immovable concrete or solid mass, the filtrate being taken from the rear of the stone, while the front of the case forms a chamber for unfiltered water, in which is contained a sweep carrying a sponge or other wiper for cleansing the face of the stone, the shaft of the wiper passing out through a stuffing-box, and having a crank on the outside for operating it. The service-inlet opens into the aforesaid water-chamber and the discharge-faucet communicates therewith for delivering unfiltered water freely without interference with the filtering apparatus. A deflector is provided within the said water-chamber to direct the current upward in contact with the moving sponge, by which means the opening of the discharge-faucet, while the wiper is carried around against the face of the stone, effects a quick and thorough cleansing of the latter and carries off the accumulated impurities.

In order that my invention may be more clearly understood, I will proceed to describe a practical embodiment of it as represented in the accompanying drawings, in which—

Figure I is a vertical section of the apparatus. Fig. II is an inside view of the face-plate or front of the casing, showing also the sweep and wiper. Fig. III is a front view of the apparatus.

The casing 1 is preferably made of cast-iron, of suitable size and proportions to receive a filtering-stone, 2, which, for ordinary domestic use, may be six inches in diameter and one-

half inch (more or less) in thickness. This filtering-stone is tightly set in the casing by means of hydraulic cement, 3. The front of the casing is closed by a face-plate, 4, secured to a flange thereon by means of bolts 5. In the center of the face-plate 4 is a stuffing-box, 6, in which works a shaft, 7, having a crank, 8, on the outside, and a sweep-arm, 9, on the inside, carrying a wiper, 10, of sponge or other suitable material, to cleanse the face of the stone by a rotary movement produced by means of the crank 8. It will be observed that the casing 1 has sufficient depth in excess of the thickness of the filtering-stone 2 to provide in front of said stone a chamber, in which the sweep-arm 9 and wiper 10 work, and which, while the apparatus is in position for use, is constantly filled with unfiltered water. A bay or depression, 11, in the lower part of the casing is provided with a screw nozzle or collar, 12, for attachment to the service-pipe 13, as represented in Fig. I.

In front of the bay or depression 11 the face-plate 4 is provided with a discharge-faucet of any common construction, and within the bay or depression is a deflector, 15, interposed between the inlet 12 and the discharge-faucet 14, so as to direct the current upward in front of the filtering-stone and in contact with the sponge or wiper 10.

The filtered water is discharged through a pipe or nozzle, 16, in the rear of the casing, and preferably in the center, which communicates through a conducting-pipe, 17, with a suitable reservoir, 18, having an overflow, 19. This reservoir may have a simple cover, to be lifted off at any time for dipping water out, or it may have a faucet shown for drawing off filtered water; or it may constitute a water-cooler of any construction. The face-plate is provided with a plug, 20, through which the wiper or cleansing material may be introduced and removed, so that it can be replenished when necessary.

Operation: It will be observed that the application of this filter to the service-pipe in no manner interferes with the free discharge of unfiltered water, which is drawn off at any time through the faucet 14; or, if preferred, the discharge-pipe may of course be carried to another part of the house.

By the water-pressure in the chamber of the filter filtered water is constantly delivered through the conducting-pipe 17 to the reservoir 18, so that a filter of small dimensions—
 5 as, for example, six inches in diameter—will furnish sufficient drinking-water for a family; but it is well known that filters operating under constant pressure become quickly foul by the accumulation of impurities in or upon the
 10 filtering medium, and in the case of the filtering-stone this accumulation quickly closes the pores of the stone to such an extent as to seriously interfere with the percolation of the water. My invention effectually obviates this
 15 difficulty by providing ready means for cleansing the face of the stone. The faucet 14 being opened, the water flows freely through it from the service-pipe, and, being directed upward into the filtering-chamber by the deflector 15,
 20 is thrown in contact with the sponge 10, as this is carried around by the sweep-arm 9. The whole body of water in the filtering-chamber is thus agitated and quickly changed, the sponge thoroughly washed, and the face of the
 25 stone sufficiently cleansed to keep the filter in a thoroughly effective condition. Any suitable material may be used for the wiper 10; but I have found sponge preferable to a brush, for the reason that while it cleanses the face of the
 30 stone sufficiently to keep it in effective condition it leaves a slight film thereon, which is desirable to protect the stone from wear and disintegration to which this porous variety of stone is subject.
 35 The bedding of the stone within the casing by means of cement is of great practical importance in that it affords a uniform and unchangeable bearing to the stone, preventing liability to fracture, and avoiding the difficulty
 40 which would otherwise exist from the gradual separation of the stone from its casing by the frequent change in pressure caused by the opening and closing of the discharge-faucet.
 I am aware that filtering-stone has been used
 45 in pressure-filters both in the form of hollow cylinders and flat slabs set in the casing by cement around the edges and leaving a chamber or receptacle for filtered water at back; but I have found by experiment that with a
 50 pressure-filter having a free discharge-faucet for unfiltered water communicating with the space in front of the stone the sudden changes in pressure caused by the frequent opening of such discharge-faucet result in loosening and
 55 ultimately breaking the stone, the material

being quite frail. To obviate this difficulty, I have devised the plan of setting the back of the stone in cement, so that it is permanently united to the casing in an immovable concrete mass without chambers or spaces at back of
 60 sufficient area to endanger the loosening or cracking of the stone by alternating or counter pressure.

Having thus described my invention, the following is what I claim as new therein and
 65 desire to secure by Letters Patent:

1. A filter constructed with a casing or support for the filtering medium, a solid filtering medium exposed to the liquid in front and embedded in cement affording a uniform bearing
 70 at back in opposition to the pressure of the liquid, and a suitable conduit to carry off the filtrate which percolates through the filtering medium, substantially as set forth.
2. The combination of the casing 1, solid
 75 filtering medium 2, firmly bedded therein without a rear chamber, and the outlet-pipe 16, communicating with the interior of the body or substance of the stone, so as to receive the water percolating therethrough, substantially
 80 as set forth.
3. A pressure-filter constructed with a casing, 1, a filtering-stone, 2, fixed immovably therein in a bed of cement, 3, to afford a uniform bearing over its entire back, a suitable
 85 inlet, 12, outlet 14, for discharge of unfiltered water, and a separate outlet, 16, for filtered water, substantially as set forth.
4. The combination of a solid filtering medium set in a casing forming a water-chamber
 90 in front, a revolving shaft in said casing, a curved wiper-arm carried by said shaft, in width nearly equal to that of the said water-chamber, a detached or removable wiper of sponge or other suitable material carried in
 95 front of the curved wiper-arm by its rotary movement, as herein explained, and a suitable plug or opening, by which the sponge or like wiping material may be introduced and removed.
5. The combination of the vertical filtering medium 2, revolving wiper-arm 9, soft wiper
 100 10, carried thereby, and deflector 15, throwing the water up into the path of the wiper, as explained.

ELIAS S. HUTCHINSON.

Witnesses:

OCTAVIUS KNIGHT,
 CHARLES F. DIETERICH.