(No Model.)

A. J. HARDER.

FILTER.

No. 604,984. Patented May 31, 1898.

Fig. 1.

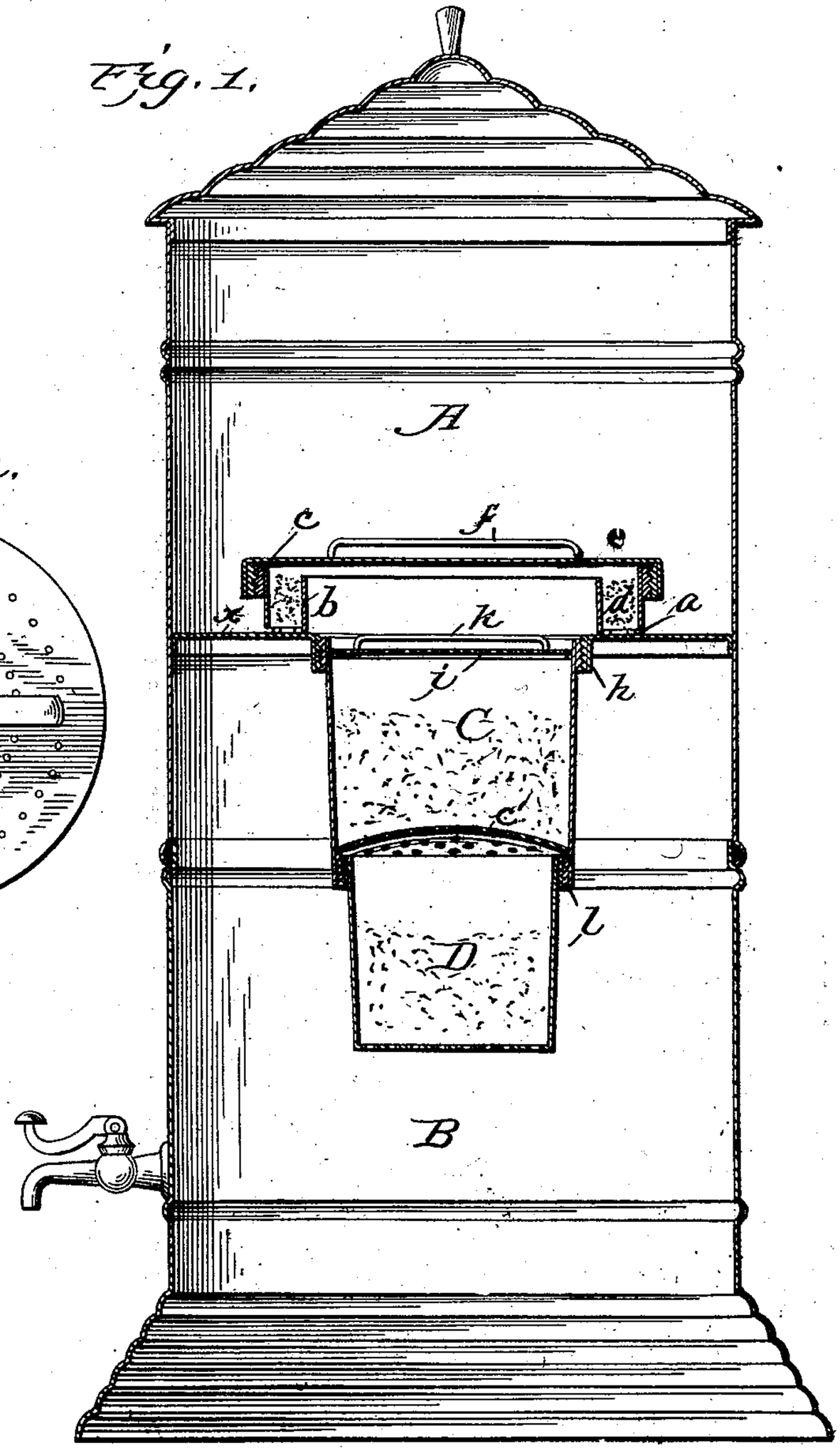
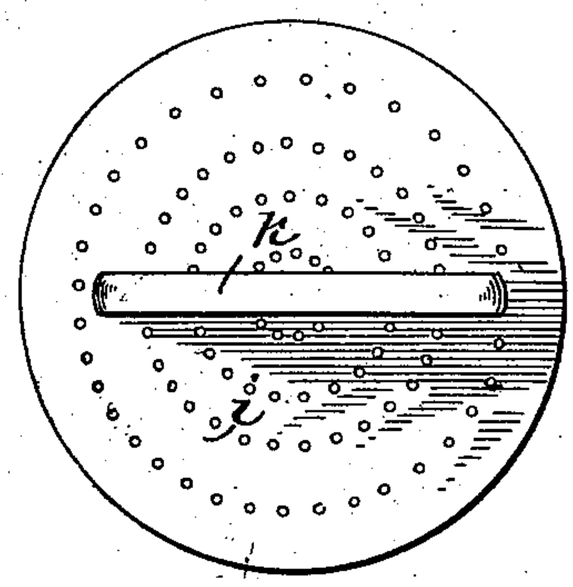


Fig. 2.



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FILTER.

SPECIFICATION forming part of Letters Patent No. 604,984, dated May 31, 1898.

Application filed April 17, 1897. Serial No. 632,684. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR J. HARDER, a citizen of the United States, residing at Williamsport, in the county of Lycoming and State of Pennsylvania, have invented certain new and useful Improvements in Filters, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to a combined water-cooler and filter, and especially to the improved construction of the filtering apparatus, in which the points of novelty reside as well in the increased efficiency and thoroughness with which the apparatus eliminates the impurities from the water to be filtered as in the simplicity of construction of the apparatus and the ease and convenience with which the various component parts thereof may be removed and replaced for the purposes of cleaning and renewing the filtering material.

Figure 1 is a sectional view through the filter. Fig. 2 is a detail view.

In Fig. 1 the chamber adapted to receive the water to be filtered is shown at A, and the receptacle for the filtered water, which may also answer the purpose of a cooler and is supplied with a cock or faucet through which to draw the water, is shown at B. The chamber A, with the filtering apparatus, as hereinafter described, is removably connected with chamber B by means of a flange arrangement or diaphragm at *x* and may be conveniently lifted off and put on again as often as may be desired. When the filter is in place, the diaphragm *a* separates the chambers A and B. Around a circular opening in the center of diaphragm, solidly attached to the upper surface of the diaphragm and at a distance of about one-half inch from the circumference of the opening, extends a circle of thin upright metal or vertical flange *b*, and concentric with flange *b*, at about one inch outside of it, extends a screw-threaded flange *c*, which is fastened to the upper surface of the diaphragm by legs or supports, leaving contracted open spaces beneath the flange *c* for the passage of the water, there being a space *d* between the flanges *b* and *c* to be filled with proper filtering material. Imperviously covering the opening in the center of the diaphragm and the flanges *b* and *c* is a removable imperforate cap *e*, having a handle *f*, (which cap is separately shown in Fig. 6, where it is shown to have a flange *g*, which is screw-threaded for the purpose of engaging the screw-threads on flange *c*,) and this cap may be conveniently removed at any time for the purpose of cleaning the apparatus beneath and of cleaning or renewing the filtering material in space *d*. Concentric with the opening in the diaphragm and solidly attached to the lower surface of the diaphragm extends downwardly a screw-threaded flange *h*, to which, by means of screw-threads at the top thereof to engage the screw-threads in the flange *h*, is removably connected a cylindrical-shaped filtering-chamber C. Within the top of chamber C is a ledge, upon which removably rests a perforated disk *i*, with a handle *k*, (which disk is separately shown in Fig. 2.) Chamber C is also provided with a pervious bottom *e'*, made of some suitable material, and is to be filled with bone-charcoal or other suitable filtering material. It may be conveniently removed and disk *i* lifted out for the purpose of cleaning and of renewing the filtering material. From the bottom of chamber C extends downwardly a circular screw-threaded flange *l*, to which, by means of screw-threads at the top thereof, to engage the screw-threads in the flange *l*, is removably connected filtering-chamber D, which is of cylindrical form, slightly smaller than chamber C, open at the top, and having a perforated bottom, and is to be filled with suitable filtering material. It may be conveniently removed for the purpose of cleaning and of renewing the filtering material. The combination of parts thus described compels the water to be filtered, which is contained in chamber A, to pass beneath flange *c*, through the spaces there, which are so contracted as to prevent the passage of large impurities and act as the first obstruction, thence through the filtering material in space *d*, thence over the top of flange *b*, thence down through the opening beneath the diaphragm *a*, thence through the disk *i*, thence through the filtering material in chamber C, thence through the pervious bottom of this chamber, thence through the filtering material in chamber D, and thence through the perforated bottom of chamber D into the final receptacle or cooler known as "chamber B." I believe that

this combination of parts and some of the sub-combinations thereof are new, resulting in an efficiency and thoroughness in eliminating the impurities from the water to be filtered and in a convenience in removing the component parts for the purpose of cleaning and of renewing the filtering material that are found in no other filter.

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

1. In combination, a chamber A for the water to be filtered, a diaphragm *a* therein, a circular opening centrally of said diaphragm, two vertical circular flanges *b* and *c* concentric with said opening, filtering-space *d* between said flanges, a removable imperforate cap *e* fitting imperviously over flange *c* by means of screw-threads, contracted spaces for the passage of the water beneath flange *c*, removable filtering-chamber C depending from said diaphragm, beneath the opening therein, and connected thereto by means of a screw-threaded flange *h*, a removable perforated disk *i* resting upon a ledge in the mouth of said chamber, removable filtering-chamber D depending from chamber C and connected thereto by a screw-threaded flange *l*, pervious bottom in chamber C and perforated bottom in chamber D, and chamber B to act as a receptacle and cooler for the filtered water, all so coacting as to produce the unitary result, substantially as described.

2. In combination with a chamber A to receive the water to be filtered, a diaphragm *a* therein, a circular opening centrally of said diaphragm, a circular screw-threaded flange *h* extending downwardly from said diaphragm concentric with said opening, a removable filtering-chamber C depending and supported from flange *h* by means of screw-threads, a screw-threaded flange *l* extending downwardly from the bottom of filtering-chamber C, a second filtering-chamber D depending and supported from flange *l* by means of screw-threads, both chambers having pervious or perforated bottoms for the passage of the water, substantially as described.

3. In combination with the chamber A, the diaphragm therein having a central opening, a circular flange depending downward from the diaphragm concentric to the opening, a filtering-chamber removably supported from said concentric flange, a second chamber depending from and removably connected to the first chamber, and perforated bottoms for both said chambers, substantially as described.

4. In a water-filter, a chamber for the water to be filtered, a diaphragm therein having an opening in the center, a concentric flange having a plurality of openings at the base thereof, an imperforate cover removably secured to said flange, and an inner imperforate flange of less height than the outer flange, substantially as described.

5. In combination, a water-chamber A, a diaphragm *a*, an opening centrally thereof, filtering-chambers depending from and removably connected with said diaphragm, a removable perforated disk covering the opening in the diaphragm, a filtering-space arranged concentric of the perforated disk with a water-passage to said space and a removable cover for said filtering-space, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR J. HARDER.

Witnesses:
ROBERT O. WELCH,
MORGAN M. BYNON.