

No. 684,555.

Patented Oct. 15, 1901.

C. I. SIMPSON.
WATER FILTER.

(Application filed May 8, 1901.)

(No Model.)

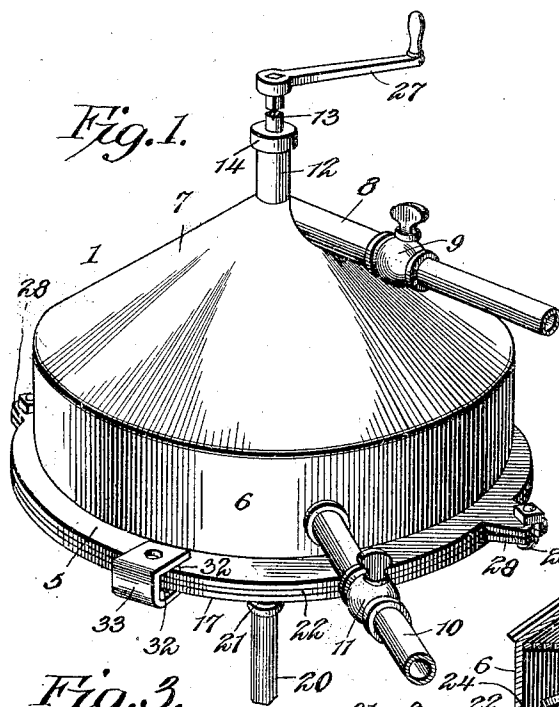


Fig. 2.

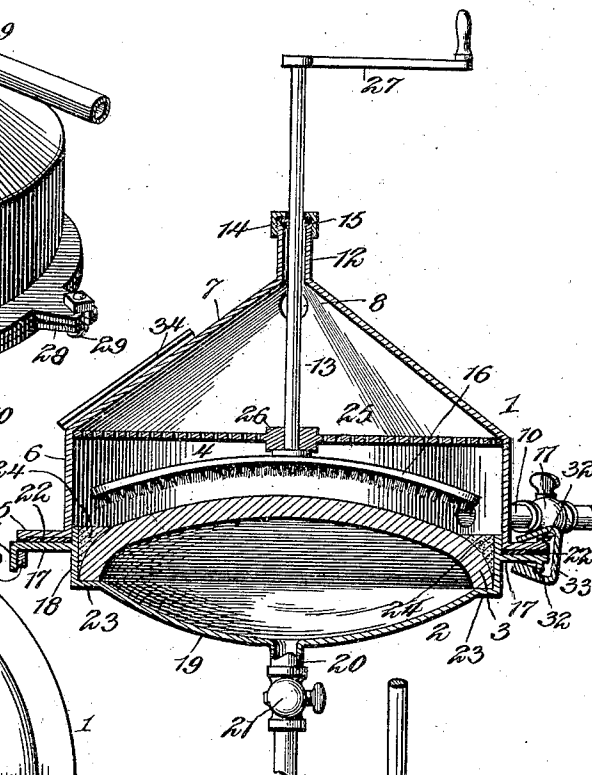


Fig. 3.

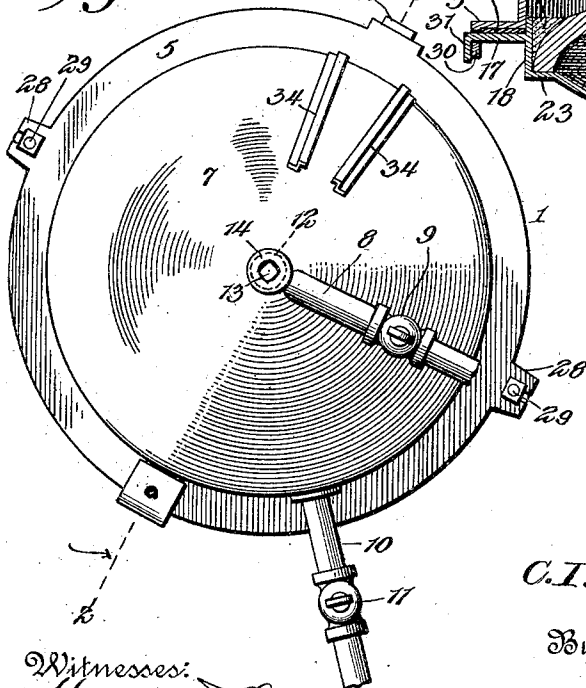
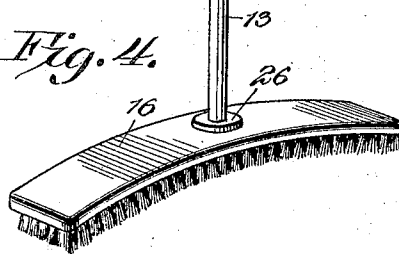


Fig. 4.



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UNITED STATES PATENT OFFICE.

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WATER-FILTER.

SPECIFICATION forming part of Letters Patent No. 684,555, dated October 15, 1901.

Application filed May 8, 1901. Serial No. 59,265. (No model.)

To all whom it may concern:

Be it known that I, CHARLES I. SIMPSON, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented a new and useful Water-Filter, of which the following is a specification.

This invention relates to filters, and more particularly to that class employing filtering-stones.

The objects of the invention are, first, without increasing the size of the filter to increase the operative surface of the filtering-stone, whereby with a stone of a given area a larger volume of water may be effectually filtered than with filtering-stones of the ordinary construction; to facilitate thorough cleansing of the filtering-stone without separating the parts of the filter, thereby obviating danger of leakage or breakage, which frequently happens where inexperienced persons attempt to disconnect the parts of the filter; to increase the efficiency of the filtering-stone-cleansing means, whereby thorough cleansing of the stone may be accomplished with but small wear to the cleansing mechanism; to render the device applicable to an ordinary tank for filtering purposes, thus rendering its use possible in places where water-pressure is not obtainable, and finally to present a thoroughly-efficient, simply-constructed, cheap, and durable filter. The cleansing feature is accomplished by combining with the filtering-stone a brush of a shape to conform closely thereto and in the provision of means whereby the water will be sprayed or sprinkled over the entire surface of the stone, so that as the brush is rotated or revolved any sediment detached will be instantly washed off, and thus not dragged over the surface of the stone, as in the case of cylindrical filtering-stones.

With these and other salient objects in view the invention consists in the further novel details of construction hereinafter described, and fully pointed out in the claims.

In the accompanying drawings, forming a part of this specification, and in which like numerals of reference indicate corresponding parts, I have illustrated a form of embodiment of my invention capable of performing the objects stated, it being understood that the same may be departed from in the mat-

ter of construction and assemblage of its parts and in proportion and minor details without departing from the spirit of the invention, and in these drawings—

Figure 1 is a view in perspective exhibiting a filter characterizing my invention. Fig. 2 is a view in vertical transverse section, taken on the line 2 2, Fig. 3, and looking in the direction of the arrow thereon. Fig. 3 is a plan view. Fig. 4 is a detail perspective view of the brush detached.

Referring to the drawings, and particularly to Fig. 2 thereof, there is illustrated a filter embodying my invention, the same comprising a receiving or unfiltered-water chamber 1, a discharge or filtered-water chamber 2, a filter-stone 3, and cleaning mechanism (designated generally 4.) The receiving-chamber and discharge-chamber are to be constructed of any suitable material, preferably of metal, combining strength with non-corrosive properties. The chamber 1 is constructed with an outwardly-extending circumferential flange 5, a body or rim 6, and a cap or top 7, these parts being either integral with each other or made of separate pieces suitably assembled. As here shown, the top or cap 7 is cone-shaped; but it is to be understood that it may be rounded or otherwise contoured and still be within the scope of my invention. The chamber 1 is provided near its top on one side with a supply-pipe 8, carrying a suitable valve 9, by which ingress of water to the chamber may be controlled, the supply-pipe to lead to any suitable source of water-supply, as to a water-main or the like. The body or rim 6 is provided with a waste-pipe 10, carrying a valve 11, by which escape of water from the chamber 1 may be readily controlled.

The upper portion or apex of the chamber 1 is provided with a tubular extension 12, constituting a bearing for the brush-shaft 13, the bearing carrying at its upper end a nut 14, between which and the top of the extension is arranged suitable yielding material 15, such as rubber or the like, to be compressed by the nut 14, and thereby present a stuffing-box to prevent escape of water. The shaft 13 carries at its lower end a brush 16, the same to be constructed to conform to the contour of the filter-stone 3 and to be assembled with

the shaft 13 in such manner as to prevent accidental separation therefrom in use. As the manner of connection between the shaft and brush-back may be of any preferred character, specific illustration of any one form of connections is deemed unnecessary. It is also to be noted that the brush *per se* may be made of material best suited to the purpose, and as these brushes are well known in the art specific description of the same is not thought to be necessary.

The chamber 2 is provided with an outwardly-extending circumferential flange 17, (which when the parts of the filter are assembled is secured to the flange 5 of the chamber 1,) with a body or rim 18, and with a depressed or dish-shaped bottom 19, the latter having at its center a discharge-pipe 20, carrying a valve 21, by which to regulate the escape of water from the chamber. The body or rim 18 extends upward beyond the flange 17, so that when the parts are assembled, as shown in Fig. 2, the rim 18 will project beyond the meeting edges of the two flanges 5 and 17, respectively, thus assisting in presenting a water-tight joint at this point. To prevent any danger of leakage at the joint where the two chambers are assembled, a rubber gasket 22 is clamped between the flanges 5 and 17, as clearly shown in Fig. 2, so that in use there will be no danger of leakage at these points. The bottom 19 is formed straight near its circumference, as shown at 23, this to form a seat upon which rests the filter-stone 3, and in order to preclude passage of water from the chamber 1 to the chamber 2 at the point where the stone rests upon the flat portion 23 of the chamber a filling 24, of cement, is interposed between the body or rim 8 and the side of the stone, as clearly shown in Fig. 2. This cement connection will be effective for the purpose designed, but will not present an obstruction to the removal of the stone when the same is to be replaced with a new one.

The filter-stone is shown as circular in plan and approximately concavo-convex in cross-section and is made of any desired thickness to accomplish the purposes designed. By making the stone this shape three desirable results are obtained, the first, as pointed out, being the obtainment of the largest possible filtering area or surface inches, the second the presentation of a large filtered-water chamber beneath the stone without increase in the size of the filter, and the third an added strength to the stone to withstand downward pressure.

Secured above the brush in any suitable manner is a foraminous or reticulated disk 25, the same being held in position within the chamber 1 in any desired manner, as by soldering or riveting, the point where the shaft 2 passes through the disk being reinforced by a bearing 26, which will prevent the shaft 13 in operation from cutting away the disk at that point.

The upper end of the shaft 13 carries a crank 27, which may be rigidly secured to the shaft or be detachable therefrom, as preferred.

Each of the flanges 5 and 17 carries oppositely-disposed ears 28, through which bolts 29 are passed to hold the rims assembled, the flange 5 being further provided with an orificed lug 30 to be engaged by a downturned toe 31, carried by the flange 17, the coaction between the toe and the lug 30 operating initially to hold the parts assembled. Each flange is further provided at a point intermediate the ears on one side with a lug or shoulder 32 to be engaged by a spring-clamp 33, this clamp acting additionally to hold the flanges 5 and 17 closely assembled.

In the use of the filter the water passes through the supply-pipe 8 in the chamber 1, thence through the screen 25, through the filter-stone 3 in the usual manner, and into the chamber 2, whence it may be drawn off through the valve 21 as required. During the operation of filtering the brush is raised above the filter-stone in the usual manner, so as not to interfere with the filtering functions. When the filter is to be cleansed, the brush is pushed down until it contacts with the filter-stone, the valve on the discharge-pipe is closed, and the valves on the supply-pipe and on the waste-pipe are opened. The water under pressure is showered down through the disk 25 onto the stone over its entire area, and by rapidly turning the crank 27 the surface of the stone will be thoroughly and evenly scoured. In order to effect a further cleansing of the filter-stone, the water in the chamber 2 is employed for this purpose, and its use is effected in the following manner: The valves on the waste-pipe and the discharge-pipe are closed, and water from the supply-pipe is allowed to flow to the chamber 1 under pressure and is thus forced through the filter-stone into the chamber 2, where it will also be under pressure. The valve on the water-supply pipe is then partially closed and that on the waste-pipe opened, and the water in the chamber 2 due to pressure will be forced upward through the filter-stone and into the chamber 1, where it escapes through the waste-pipe, the upward escape of the water serving to dislodge and free any silt or mud that may adhere to the stone and escape the action of the brush. It is to be understood that when the water is passing from the chamber 2 the brush is operated at the same time to carry away the foreign matter. After the stone is thoroughly cleaned the waste-pipe 11 is closed, as is also the valve of the discharge-pipe, the brush is lifted, and water from the supply-pipe again permitted to enter the chamber 1.

It will be understood that the sprayer-plate 25 remains normally within the filter and is therefore normally active to spray the supply liquid over the entire surface of the filtering element, thereby to avoid wearing away

of said filtering element at any one point, as is the case where the liquid is supplied directly to the filtering element by means of a single stream. Thus the sprayer device has a normal function in addition to that of spraying the water during the cleaning operation.

When the filter is used in connection with an ordinary supply-pipe, the cap 7 is provided with cleats 34 to engage a bracket projecting from the wall adjacent to the supply-pipe. Where it is to be used in connection with a tank or jar, as before pointed out, the flanges 10 and 17 will be suitably secured to the open end of the tank or jar, and when the filter is thus associated in order to effect cleansing it will only be necessary to lengthen the shaft 13, so as to bring it up within easy reach of the operator. The brush may be detached and applied to tanks or open jars where water-pressure is not used by simply shaping the brush to fit the filtering substance. It is also equally adaptable for use in connection with flat and cylindrical filter-stones.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

What I claim is—

1. A filter comprising a receiving-chamber, a discharge-chamber, and a filtering element forming a partition between the chambers, a sprayer device in the receiving-chamber, and a cleaning-brush located between the sprayer and the filtering element and in operative relation to the latter.

2. A filter comprising a receiving-chamber, a discharge-chamber, a filtering-stone separating the two chambers, a cleaning-brush above the stone, and a foraminous disk above the brush.

3. A filter comprising a receiving-chamber, a discharge-chamber, a filter-stone separating the two chambers, a brush arranged above the stone and of a shape to conform thereto, a foraminous disk arranged above the brush, and a water-supply pipe above the disk.

4. A filter comprising a receiving-chamber having a supply-pipe communicating therewith near its top and a waste-pipe at its side, a discharge-chamber provided with a discharge-pipe, a filter-stone separating the two chambers, a brush arranged above the stone, a foraminous disk arranged above the brush, and means for imparting rotary motion to the brush.

5. A filter comprising a casing, having an inlet and an outlet, a filtering element located between the inlet and outlet and forming a partition dividing the casing into a receiving-chamber and a discharge-chamber, and a fixed spraying device which is located between and

is separate from the filtering element and the inlet and is coextensive with the filtering element to normally and uniformly spray all of the surface thereof.

6. A filter, comprising an upper chamber having an open bottom, a lower chamber having a dished bottom, an upstanding marginal body portion telescoped within the upper chamber, and a marginal seat located between the dished bottom portion and the body, a filter device supported upon the seat and having a convex upper surface, and an adhesive securing element filling the marginal space between the rounded edge of the filtering element and the body of the lower chamber.

7. A filter, comprising oppositely-disposed receiving and discharge chambers having their adjacent sides open and in mutual communication, a filtering element carried by the discharge-chamber and forming a separating-partition between the two chambers, and a perforate sprayer-plate carried within the receiving-chamber, whereby the chambers may be separated without detaching the filtering element and the sprayer-plate.

8. A filter comprising a discharge-chamber provided with a supply-pipe, and with a waste-pipe, the discharge-chamber having a dish-shaped bottom with a discharge-pipe communicating therewith, a filter-stone rigidly assembled with the bottom, a foraminous disk secured within the receiving-chamber and provided at its center with a bearing, a shaft working in the said bearing and in the stuffing-box formed at the top of the receiving-chamber, a brush carried by the lower end of the shaft, and means for imparting rotary motion to the shaft.

9. A filter comprising a casing, having an inlet and an outlet, a filtering element located between the inlet and outlet and forming a partition dividing the casing into a receiving-chamber and a discharge-chamber, a fixed spraying device which is located between and is separate from the filtering element and the inlet and is coextensive with the filtering element to normally and uniformly spray all of the surface thereof, a frictional cleaning device mounted between the sprayer device and the filtering element and in frictional relation to the latter, and exteriorly accessible means for operating the cleaning device to cleanse the filtering element.

10. A filter comprising a receiving-chamber formed with straight sides and cone-shaped top terminating in a stuffing-box, a discharge-chamber provided with a dish-shaped bottom formed near its periphery with a flattened portion, a filter-stone resting on the flattened portion and held in place by a cement interposed between the inner side of the discharge-chamber and the filter-stone, means for spraying water over the entire surface of the stone, and means for cleaning the stone.

11. A filter comprising a receiving-chamber provided at its base with a circumferential flange bearing oppositely-disposed ears and

with a downturned perforated lug, a receiving-chamber provided with a circumferential flange having oppositely-disposed ears, and with a toe to engage the perforated lug on the
5 receiving-chamber, and bolts passed through the ears whereby to clamp the two chambers together.

12. A filter comprising a receiving-chamber, a discharge-chamber, the two being suitably
10 held assembled, a filter-stone within the filter, a foraminous disk arranged above the stone

and operating to spray water over the surface thereof when the same is to be cleaned, and a brush to remove dislodged matter.

In testimony that I claim the foregoing as
my own I have hereto affixed my signature in
the presence of two witnesses. 15

CHARLES I. SIMPSON.

Witnesses:

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J. H. BERDOLLT.