

F. HENSHAW.

Water Filters.

No. 124,741.

Patented March 19, 1872.

Fig. 1.

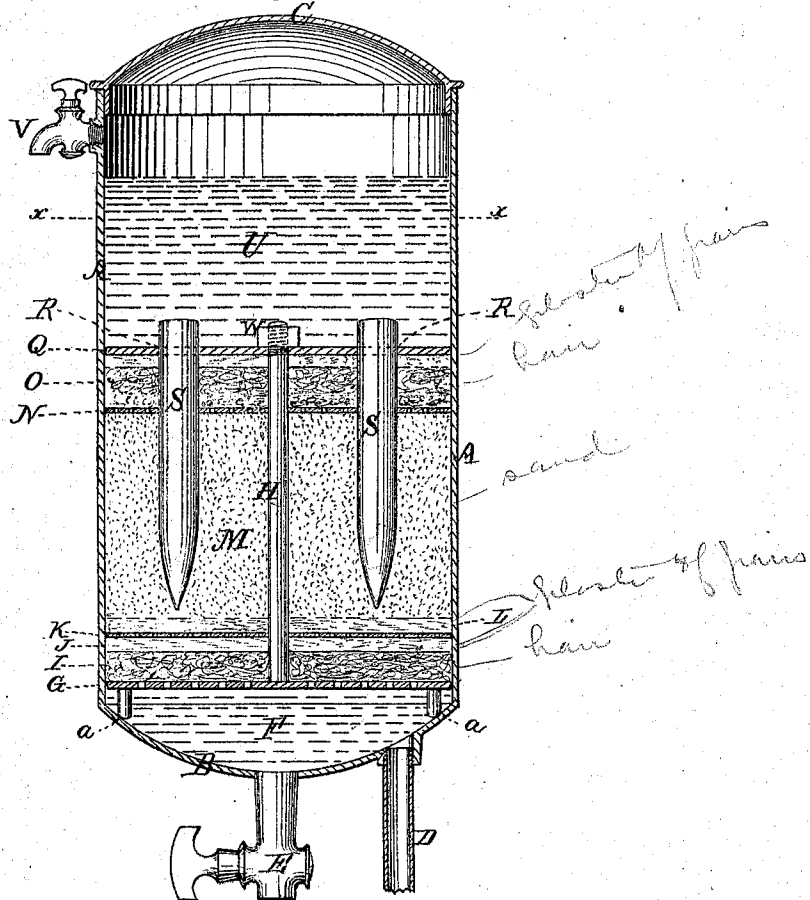
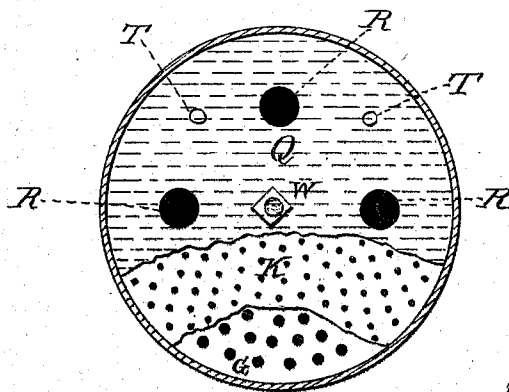


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

FOSTER HENSHAW, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN WATER-FILTERS.

Specification forming part of Letters Patent No. 124,741, dated March 19, 1872.

SPECIFICATION.

To all whom it may concern:

Be it known that I, FOSTER HENSHAW, of Washington city, in the county of Washington and District of Columbia, have invented certain new and useful Improvements in Water-Filters; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing making a part of this application.

My invention has for its object to produce a water-filter which shall be perfectly effective; and consists in the peculiar construction and manner of putting the parts together, as will be hereinafter more fully set forth.

To enable those skilled to make and use my improved filter, I will proceed to describe the same, referring by letters to the accompanying drawing, in which—

Figure 1 is a central vertical section, and Fig. 2 a transverse section at the line *xx* of Fig. 1, so broken away as to show parts of the two lowermost straining-plates or screens, and the relative sizes of the apertures therein.

Similar letters indicate like parts in the several figures.

A is a cylinder, of iron or other suitable material, and having a concave bottom and top, B C. The top C is removable, while the bottom B is securely fastened, water-tight, with the cylinder A. This bottom B is provided with an inlet-pipe, D, near one side, through which the water is admitted to the apparatus to be filtered, and another pipe, E, is connected with this bottom at the center, and is denominated the outflow or cleaning pipe. F is a water-space, in which the muddy water first appears, and it is in this space that most all of the filth is retained. G is the first plate of the lower screen; this plate is made of strong rigid sheet metal, and is kept away from the bottom B by legs *a a*, or by the natural formation of the said bottom. To the center of this plate is secured, by a screw-thread or otherwise, a rod, H, of a length sufficient to reach through the uppermost plate of the top screen. I is a layer of fine hair, which I place immediately upon the plate G, which, as will be seen by reference to the drawing, is perforated like an ordinary "colander." The depth of this layer of hair, as well as all other filtering agents which I shall hereafter allude to, will depend

upon and be regulated by the experience of those skilled in the manufacture of the filters. J is a thin layer of plaster of Paris, which I sprinkle upon the hair, and on top of this plaster I drop the top-plate K of the "lower screen." This plate is perforated with much smaller holes than the plate G, and has also a central hole, which enables it to be strung upon the rod H and move freely thereon, and is, as will be observed, made of much thinner metal, in order that it may adapt itself horizontally to inequalities in the surface upon which it rests. On top of this plate I sprinkle another layer of plaster, L, though this is not absolutely necessary. I then fill up to the proper height with sand, M, and then drop over and upon the rod H another thin plate, N, which is similar in all respects to the plate K. On top of this plate I put another layer of hair, O, and a sprinkling of plaster, P, and then cover the whole with the uppermost plate Q, which, like the plate G, is very strong, but is not similarly perforated, having only about four large holes, R, through which pegs or wedges S pass, as will be presently explained; and about four intermediate and somewhat smaller holes, T, through which the water in a filtered condition makes its escape to the reservoir U, and is drawn off through the stop-cock V at or near the highest point on the side of the cylinder A. The reason for so locating this cock is that the reservoir shall always be full of water for the purpose of washing out the filter, as will be hereafter more fully set forth. After the last plate Q is in position, with the end of the rod H protruding through the center thereof, a nut, W, is applied and screwed down as hard as possible. The other end of the rod being securely attached to the lower plate G, it will be seen that they are drawn toward each other, and the filling of hair, plaster, and sand is compressed from both ends, thereby insuring a more perfect compacting; or, in lieu of this mode of drawing these two plates together, the rod H may be secured to the two plates by being provided with right-and-left hand screw-threads moving in corresponding threads in the two plates, and after the plates have been drawn together, and the filling compressed as much as it is possible by that means, the wooden pegs S are driven down through the holes R in the plate Q, and corresponding ones

in the next lower one, N, and into the sand M, and in this way the filling is still further compressed. I may here remark that instead of "plaster Paris" I may use finely-granulated stone.

I have found, from many years' experience and after extended experiment, that the most essential thing to make a perfect filter is that the filtering material should be perfectly compressed, for wherever any point is in the slightest degree uncompressed the water will naturally seek it and after a while cut a channel through it, washing out the filtering material, and finally rendering it worthless. I have discovered that the material cannot be properly located and compressed, except it be under water, and to this discovery is due the greater part of my success; I therefore pack my case or cylinder under water, so that all "honey-combs" or air-spaces are avoided.

It will now be seen that muddy or dirty water, entering through the pipe D, is passed into the space F and then through the bottom screen, composed of the two plates G K and the intermediate filling, and then through the sand and up through the top screen to the reservoir U, and out the stop-cock V. Most of the mud and dirt is left in the first or lower screen, and at night, or at any time necessary, the supply of water is shut off; this leaves the reservoir U full, of course; the pipe E (which is closed when the water is being fed to the

filter) is now opened, and the clear filtered water in the reservoir flows down through both screens and washes them completely out, and makes its exit through the pipe E.

Having described the construction and operation of my improved filter, what I claim as new, and desire to secure by Letters Patent, is—

1. The upper and lower screens, constructed as described, (both of less diameter than the cylinder,) in combination with a central compressing-rod, adapted to draw both screens toward the center, as and for the purposes set forth.

2. In combination with the upper and lower screens and central compressing-rod, the wedges S, as and for the purpose hereinbefore set forth.

3. In a water-filter, auxiliary or additional compressing device, consisting of wedges S, as described.

4. The method herein described of filling the screens and packing the sand between the same under water, substantially as and for the purposes set forth.

Witness my hand and seal this 7th day of December, 1871.

FOSTER HENSHAW. [L. s.]

Witnesses:

ARTHUR L. MCINTIRE,
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