

No. 636,356.

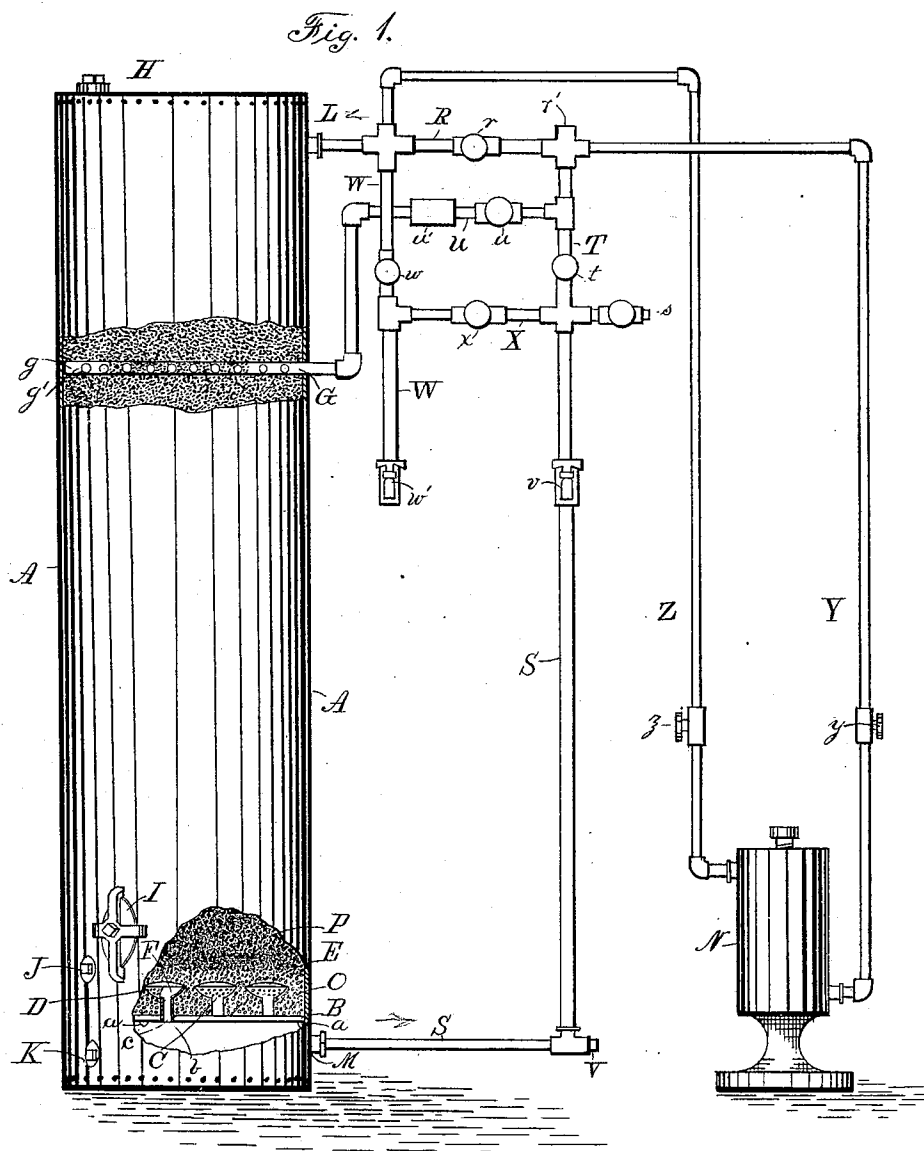
Patented Nov. 7, 1899.

W. H. RANDALL.
WATER FILTER.

(Application filed Dec. 3, 1898.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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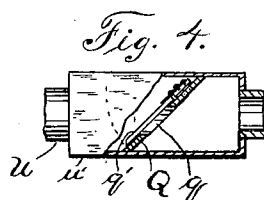
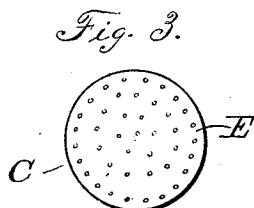
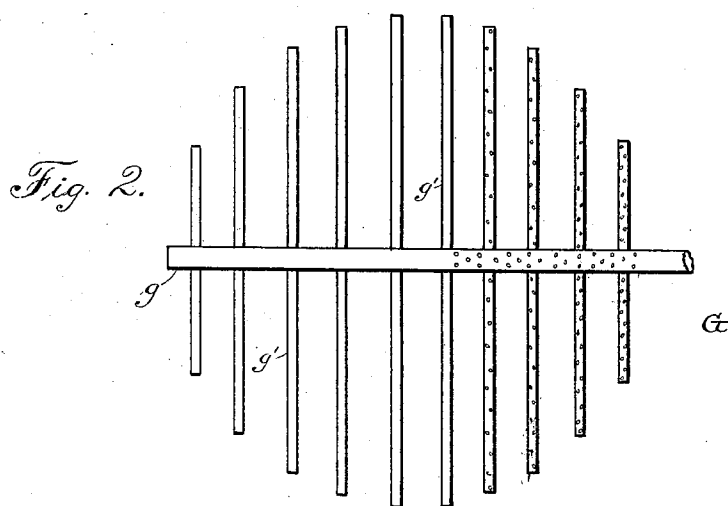
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UNITED STATES PATENT OFFICE.

WILLIAM H. RANDALL, OF EVANSVILLE, INDIANA.

WATER-FILTER.

SPECIFICATION forming part of Letters Patent No. 636,356, dated November 7, 1899.

Application filed December 3, 1898. Serial No. 698,151. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. RANDALL, a citizen of the United States, residing at Evansville, in the county of Vanderburg and State of Indiana, have invented certain new and useful Improvements in Water-Filters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates generally to the purification of water; and it consists especially in certain novel features which greatly facilitate the filtering process and afford decided conveniences in the operation, adjustment, and cleaning of these apparatus.

My invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a general view in elevation of my filter, with portions of the tank broken away, whereat is shown the general arrangement of the interior parts, one of the nozzles being partly in section, and a view of the alum-box and its connections. Fig. 2 is an enlarged plan view of the system of pipes in the tank, a part only shown as perforated. Fig. 3 is an enlarged plan of a filter-nozzle with perforations; and Fig. 4 is an enlarged side elevation, partly in section, of the check-valve.

Like letters of reference denote corresponding parts in the several views of the drawings.

A is a tank or reservoir containing the filtering devices and materials and adapted to receive, purify, and discharge the water introduced into it. This tank is to be placed in a vertical position in order that the relative positions of the contents may be properly maintained by the force of gravity.

B is a disk of the same diameter as the cylindrical reservoir A and adapted to rest horizontally upon the lugs *a a*, projecting from the interior sides of the tank A. This disk is provided with holes *b b* to receive the hollow stems of the nozzles C C. These nozzles C C are each preferably constructed of a hollow stem *c*, provided with a flaring top D, and a cap E closing over said top to form a

chamber F. When the hollow stem *c* is fitted into the hole *b*, this chamber is above it, and two surfaces, one upper and one under, are available for perforation. Either or both may be so treated; but the greatest advantages seem to result when the perforations are confined to the under surface of the nozzle. It is better to tap the holes *b b* and thread the stems *c c* of the nozzles C C, that connection may be easily effected and that the nozzles may be detached readily and without marring the parts.

G is a system of perforated pipes, consisting of the central pipe *g* and the branch pipes *g' g'*. This construction extends horizontally across the interior of the tank A, and its central pipe *g* penetrates the side of the tank and is continued, as hereinafter described. It is intended that the perforations in these pipes should extend, suitably spaced, throughout their entire surface. The disk B is located near the bottom of the tank and the system of pipes G in the upper portion of the tank. The pipes *g g'* are used to loosen up and cleanse the sand when it becomes soiled and compacted into a hard mass. These pipes are supplied with water by opening valve *u* and closing valves *r* and *t*.

H is an opening in the top of the tank A, through which the gravel and quartz used in the filtering process are inserted. It is provided with a plug which closes it water-tight when the filter is in operation.

I is a hand-hole opening into the tank a little above the disk B and is closed in any preferred manner.

J is a plug in an opening in the side of the tank A, through which the filtering material may be removed.

K is a plug for a similar opening under the disk B and is provided for the purpose of cleaning out the chamber under said disk.

L is a hole near the top of the tank A, opening into the water-space over the filtering material and adapted to receive from the service-pipe the water to be filtered, and M is a hole leading into the water-space under the disk B, through which the filtered water is discharged.

N is an alum-box through which the water in any desired portion may be passed before entering the filter and is located outside of,

but conveniently near and connected with, the tank A.

O is the gravel resting upon the disk B and covering over the nozzles C C.

5 P is crushed quartz resting upon the gravel O and extending to within a suitable distance below the hole L.

R is the service or supply pipe leading to the hole L and is provided with a valve *r*. It
10 connects at *r'* with the water-main.

S is the discharge-pipe, leading from the hole M, having the draining-plug V, the faucet *v*, and deflected to the valve *s*.

T is the reverse inlet-pipe, leading from the
15 service-pipe R at a point beyond the valve *r* from the tank to the discharge-pipe at its point of deflection and having the valve *t* near its lower extremity.

U is the supply-pipe for the perforated-
20 pipe system G and leads from the pipe T past the valve *u* and the check-valve *u'* to the central pipe *g*, to which it is attached.

W is the waste-pipe, leading from the service pipe R, between the valve *r* and the tank
25 A, to waste. This pipe W is provided with a valve *w* and under that valve with a faucet *w'*.

X is a connecting-pipe between the discharge-pipe at its deflection and the waste-
30 pipe between the valve *w* and faucet *w'* and is provided with a valve *x*.

Y is the supply-pipe to the alum-box and leads from the service-pipe R, at its connection with pipe T, to the alum-box.

35 *y* is a valve on the pipe Y.

Z is the discharge-pipe from the alum-box, having a valve *z*, and leads to the supply-pipe R at its connection with the waste-pipe W.

The connection of this filter is as follows:
40 Connect the service-pipe R with the water-supply. Connect the discharge-pipe S at its termination beyond the valve *s* with the pipe for service of filtered water. Connect waste-pipe W so that the waste water may be properly carried away. Connect the supply-pipe
45 of the alum-box with the supply-pipe R at the junction next to the water-supply connection. Connect the discharge-pipe Z of the alum-box with the supply-pipe R between the valve *r*
50 and the tank A. Enough washed small gravel should be put into the opening H on top of the tank A to cover the nozzles C C. Then the crushed quartz should be put in until it reaches to within about one-sixth of the
55 height of the tank from the top.

The operation of this filter is very simple and readily understood, as is also the manner of cleaning it, and is as follows: Valves *t*, *s*, and *w* should be closed and then valves *r*

and *x* opened. Let the water run out of the
60 waste-pipe W until it is clear, which may be seen upon opening the faucet *w'*. When the water is clear, open valve *s* and close valve *x*. After considerable use of the filter the water
65 should be tested by opening the faucet *v*, and when the water appears cloudy the current should be reversed and the filter thereby cleaned. This is accomplished as follows: Close the valves *z* and *y* on the alum-box, then
70 close valves *r* and *s* and open valves *w* and *t*. At first the water will be muddy, but gradually will become clear, as shown at the faucet *w'*. When cleaned in this manner, the filter is ready for operation, as at first. The pipes
75 may be drained at the plug V. The supply of alum-water may be regulated by the adjustment of valves *r*, *y*, and *z*.

A decided advantage of the construction as set forth above is the ease with which the
80 parts can be removed and replaced.

Having described all that is necessary to a full understanding of my invention, what I claim, and desire to secure by Letters Patent, is—

1. A vertical filtering-tank, provided with
85 inlet and outlet for the water, having the disk B and nozzles C, the system of perforated pipes G, and adapted to support upon said disk B, suitable filtering material; in combination with the pipes R, S, T, U, W, and
90 X, and valves *r*, *s*, *t*, *u*, *w*, and *x*; connected and disposed substantially as shown and described.

2. In a water-filter, a controlling system for
95 supply, discharge, and cleaning, consisting of the pipes R, S, T, U, W, and X, and the valves *r*, *s*, *t*, *u*, *w*, and *x*, all connected and disposed substantially as shown and described.

3. In a water-filter, a controlling system for
100 supply and discharge, consisting of the pipes R, S, T, W, and X, valves *r*, *s*, *t*, *w*, and *x*, and connected and disposed as shown.

4. A filtering apparatus, consisting of the
105 tank A, having the disk B with the nozzles C, the system of pipes G, adapted to contain upon said disk C suitable filtering material and provided with inlet and outlet for water; the pipes and valves R, *r*, S, *s*, T, *t*, U, *u*, W, *w*, X, *x*, Y, *y*, and Z, *z*, all arranged and disposed as shown; and the alum-box N, adapted
110 to receive the ends of the pipes Y and Z; substantially as shown and described.

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

WILLIAM H. RANDALL.

Witnesses:

SAML. CRUMBAKER,
WM. H. GUDGEL.