

(No Model.)

C. F. HITCHCOCK.
WATER FILTER.

No. 604,615.

Patented May 24, 1898.

Fig. I.

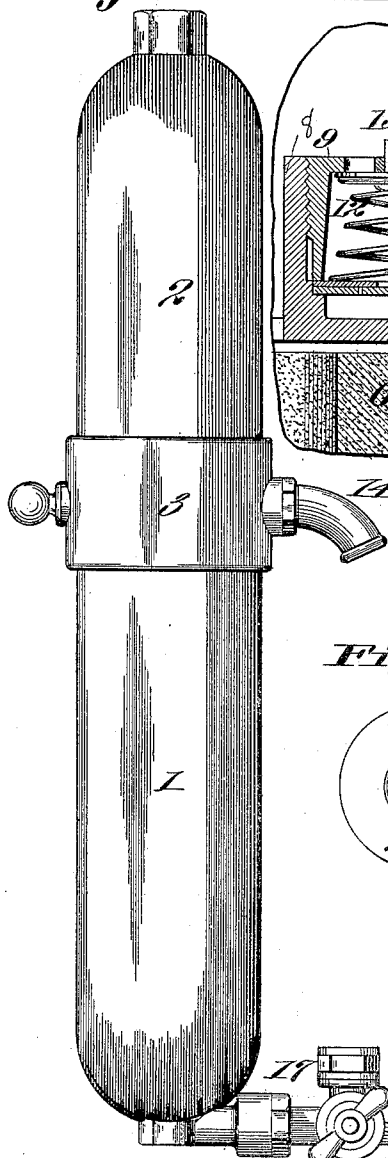


Fig. III.

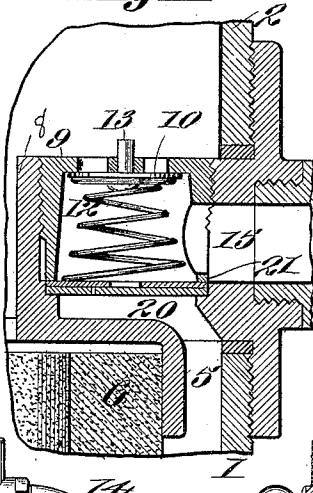


Fig. II.

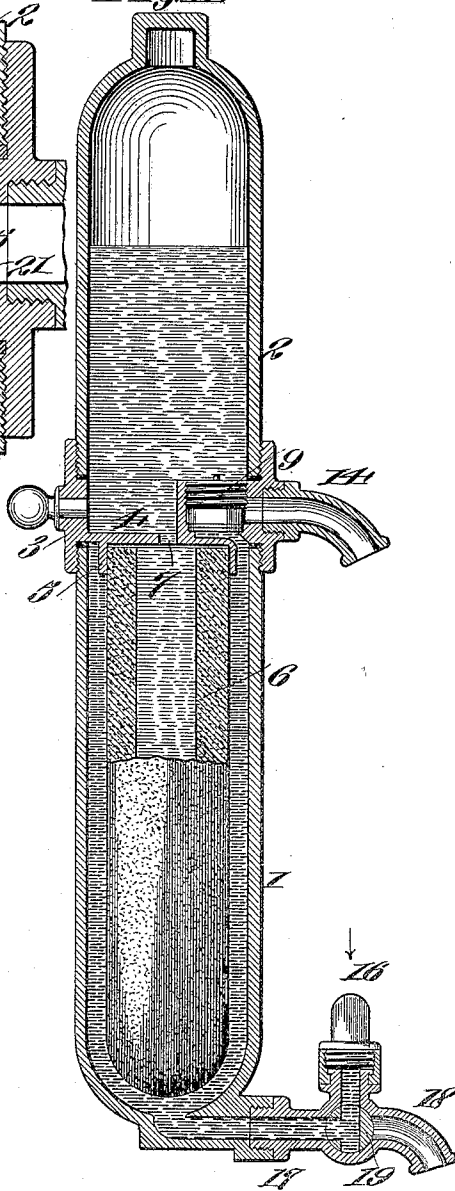
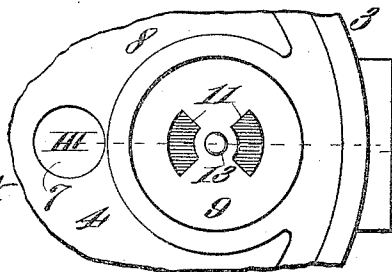


Fig. IV.



Fig. V.



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UNITED STATES PATENT OFFICE.

CHARLES F. HITCHCOCK, OF ST. LOUIS, MISSOURI, ASSIGNOR OF TWO-THIRDS
TO URVILLE D. TIBBETTS AND PHILIP J. CONROY, OF SAME PLACE.

WATER-FILTER.

SPECIFICATION forming part of Letters Patent No. 604,615, dated May 24, 1898.

Application filed January 5, 1898. Serial No. 665,667. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. HITCHCOCK, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have
5 invented certain new and useful Improvements in Water-Filters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

10 My invention relates to certain improvements in water-filters, the construction being such that by opening a valve in the supply-pipe water is permitted to pass through a filtering medium into a closed tank and after
15 reaching a certain pressure therein opens an automatic valve and flows out through a discharge nozzle or faucet in a filtered condition. After the desired amount of filtered water has been drawn off the valve is moved to close
20 the supply-pipe and open up a communication between the filter and a waste nozzle or pipe, whereupon the automatic valve closes, and the water contained in the closed tank wastes back through the filtering medium,
25 which is cleaned thereby.

My invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a side view of my improved filter. Fig. II is a longitudinal section. Fig. III is a detail vertical section taken on line
30 III III, Fig. V, and which shows the automatic valve referred to. Fig. IV is a top view of the air-vent of the automatic valve. Fig. V is a detail top view of the automatic valve and its housing.

Referring to the drawings, 1 represents a lower tank or chamber, and 2 an upper tank or chamber, the two tanks being connected
40 together by a ring 3, into the lower end of which the tank 1 is tapped and into the upper end of which the tank 2 is tapped.

The ring 3 has a diaphragm 4, from which depends a flange 5, that receives the upper
45 end of the filtering-stone 6, that is located in the lower tank 1 and which is of less diameter than the interior of the tank, so as to leave a water-space between the two. The stone 6
50 through enters the tank 2 through a perfora-

tion 7 in the diaphragm 5. As the water enters the tank 2, which is a closed tank, it compresses the air therein, as will be readily understood.

Formed on the upper side of the diaphragm
54 is a flange or ring 8, in which fits a hollow plug or housing 9, that receives a valve 10. The plug is screwed into the flange or ring 8, as shown in Fig. III, so that it can be removed when necessary. The valve 10 seats
60 against the under side of the top of the plug 9 and closes openings 11 in the top of the plug. The valve is held to its seat by a spring 12, located within the plug. It is guided in its movement by a stem 13, fitting in a perfora-
65 tion in the top of the plug.

14 represents the discharge-nozzle, which communicates with the interior of the plug 9, as shown at 15, Fig. III.

16 represents the supply-pipe leading from
70 the city main or other source of supply and which connects with the lower tank 1 through a short pipe 17.

18 represents the discharge pipe or nozzle.

19 is a three-way valve which controls the
75 passage of water from the supply-pipe into the tank 1 and from the tank 1 to the discharge pipe or nozzle 18.

The operation is as follows: When it is desired to draw filtered water, the valve 19 is
80 turned to open up a communication between the supply-pipe and the tank 1. Water passing into the tank 1 filters through the stone 6 and enters the tank 2 in a filtered condition. As soon as the water in the tank 2 reaches a
85 sufficient pressure (due to the tank being a closed tank) the valve 10 will automatically open and the filtered water will flow through the discharge-nozzle 14. When sufficient
90 water has been drawn, the valve 19 is turned to close off the supply-pipe and open up a communication between the tank 1 and the discharge-nozzle 18. When this is done, the
95 valve 10 automatically closes under the influence of the spring 12 and the water contained in the tank 2 passes back through the filtering-stone and wastes through the nozzle
18. As the water passes back through the stone it cleans the latter of sediment and impurities that settled thereon while the water
100

was filtering therethrough. The filter now stands in an empty condition until more filtered water is wanted, and then the operation is repeated.

- 5 In order that the water may drain out of the tank 1 each time the discharge-nozzle is opened, I provide the automatic valve with an air-vent, which I have illustrated in the form of a flexible disk 20, seated beneath a
10 perforated plate 21, upon which the plug 9 fits, as shown in Fig. III. The disk 20 is provided with a semicircular slit 22 (see Fig. IV) after the manner of forming an ordinary flap-valve. When the water wastes out of the
15 upper tank, this vent opens and allows a passage of air into the tank 1, so as to permit the water to flow therefrom each time the filter is turned off, and when the water is turned on again the vent will close, as will
20 be readily understood.

The valve 10 acts as a retaining-valve and its function is to hold a certain amount of water in the clear-water chamber. This amount depends upon the strength of the
25 spring 12, and after the force of the spring 12 has been overcome by the pressure of the water in the clear-water chamber the valve opens, allowing the clear water to flow out through the discharge. After the valve 19 is
30 moved to open a communication between the filtering-chamber and the waste nozzle or pipe the automatic valve closes and the water remaining in the clear-water chamber is forced back through the filtering-stone under
35 the pressure stored in the clear-water chamber by virtue of the presence of the check-valve.

I claim as my invention—

- 40 1. In a water-filter, the combination of a tank having a filtering medium, a clear-water tank to receive the water after it passes through the filtering medium, a supply-pipe, a valve controlling the flow of water from the supply-pipe to the filtering-tank and from the
45 latter to a waste pipe or nozzle, a discharge-nozzle and an automatic valve located in the discharge from the clear-water chamber, substantially as set forth.

- 50 2. In a water-filter, the combination of a tank or chamber for receiving the filtering medium, a tank or chamber for receiving the filtered water, a valve for controlling the passage of water to the filtering-chamber and from the chamber to a waste, and an auto-
55 matic valve located in the discharge from the clear-water chamber; said last-mentioned valve being arranged to open under the pressure of water in the clear-water chamber and to close on the opening of a communication

between the filtering-chamber and the waste, 60 substantially as set forth.

3. In a water-filter, the combination of a filtering-chamber, a valve controlling the flow of water into the filtering-chamber, a clear-water chamber and an automatic valve located 65 in the discharge from the clear-water chamber, substantially as set forth.

4. In a water-filter, the combination of a filtering-chamber with which supply and waste pipes connect, a single valve for controlling 70 the flow of water from the supply-pipe to the filtering-chamber and from the filtering-chamber to the waste-pipe, a clear-water chamber and an automatic valve located in the discharge from the clear-water chamber, substan- 75 tially as set forth.

5. In a water-filter, the combination of a filtering-chamber, a valve controlling the flow of water to and from the chamber, a clear-water chamber and an automatic valve located 80 in the discharge from the clear-water chamber; said automatic valve being arranged to open under the pressure created in the clear-water chamber and being arranged to close 85 when water wastes from the filtering-chamber, and said automatic valve being provided with a vent to permit air to pass into the filtering-chamber, substantially as set forth.

6. In a water-filter, the combination of a filtering-tank, a clear-water tank, a ring connecting the tanks together and which is provided with a perforated diaphragm, an auto- 90 matic spring-valve connected to said ring, and adapted to open up a communication between the clear-water tank and a discharge-nozzle, 95 a supply-pipe, a discharge pipe or nozzle, and a valve controlling the flow of water from the supply-pipe into the filtering-tank and from the latter to the discharge-nozzle, substan- 100 tially as set forth.

7. In a water-filter, the combination of a filtering-tank, a supply-pipe and a discharge pipe or nozzle communicating with the filtering-tank, a valve controlling the flow of water 105 from the supply-pipe to the filtering-tank and from the filtering-tank to the waste-nozzle, a clear-water tank, a ring connecting the filtering-tank and the clear-water tank, and which is provided with a perforated dia- 110 phragm and a raised flange, a plug fitting in said flange and a spring-actuated valve located within the plug, substantially as set forth.

CHARLES F. HITCHCOCK.

In presence of—

E. S. KNIGHT,
N. V. ALEXANDER.