(No Model.)

J. L. WELSHANS.

WATER FILTER.

No. 574,858. Patented Jan. 5, 1897.

Fig. 1.

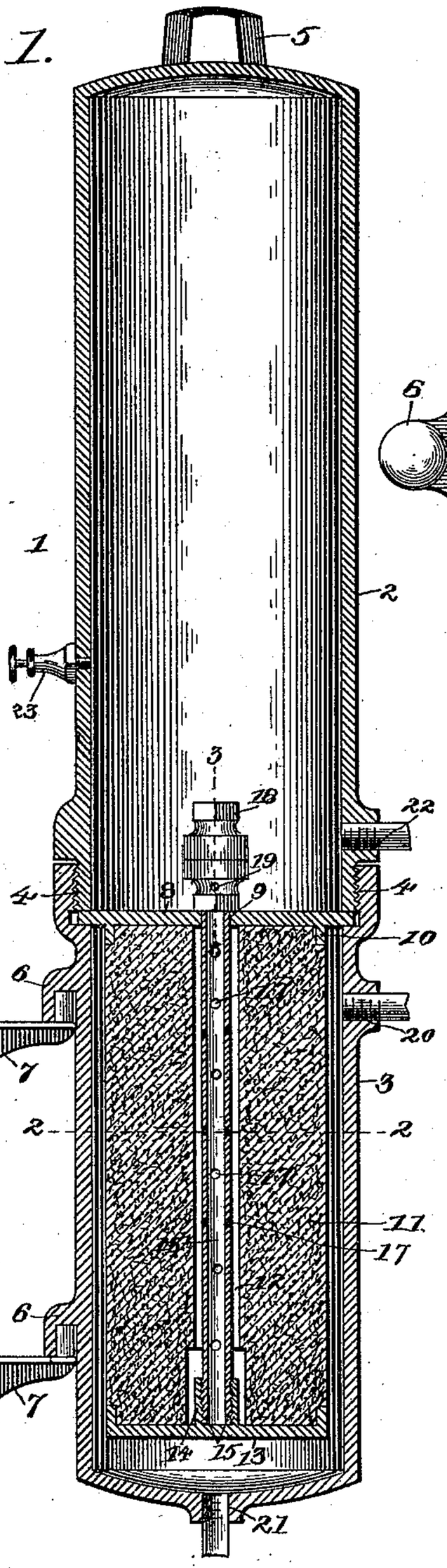


Fig. 2.

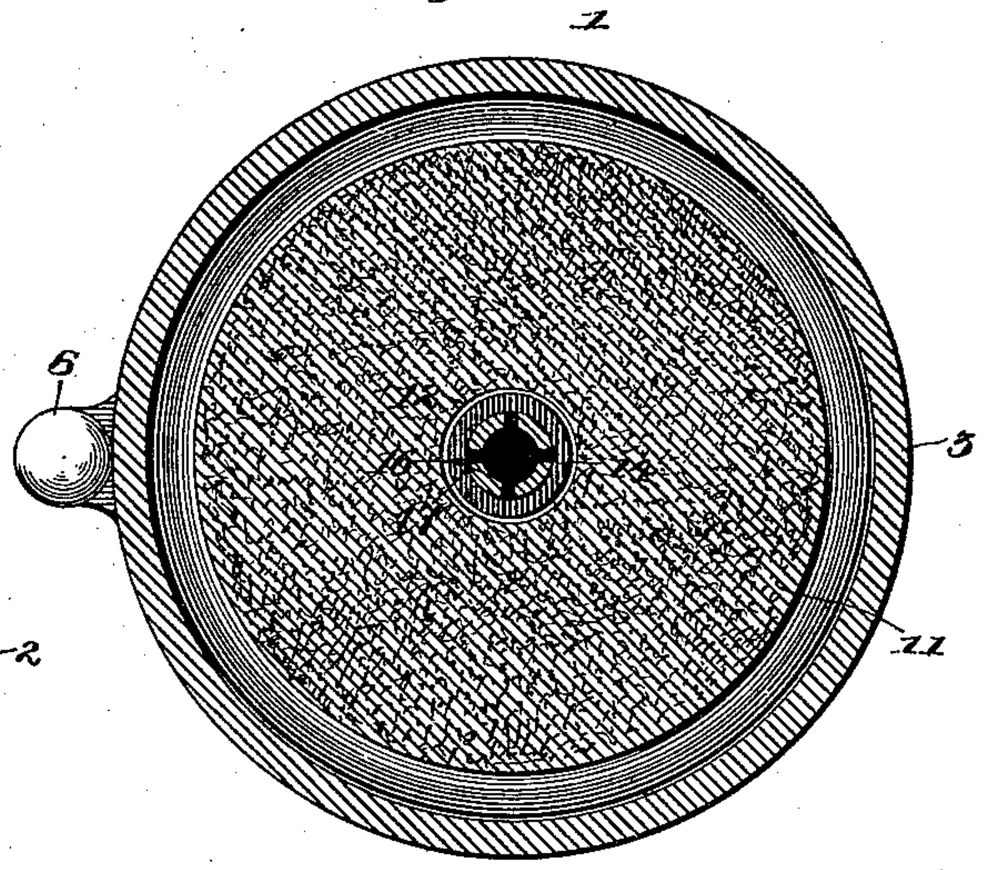
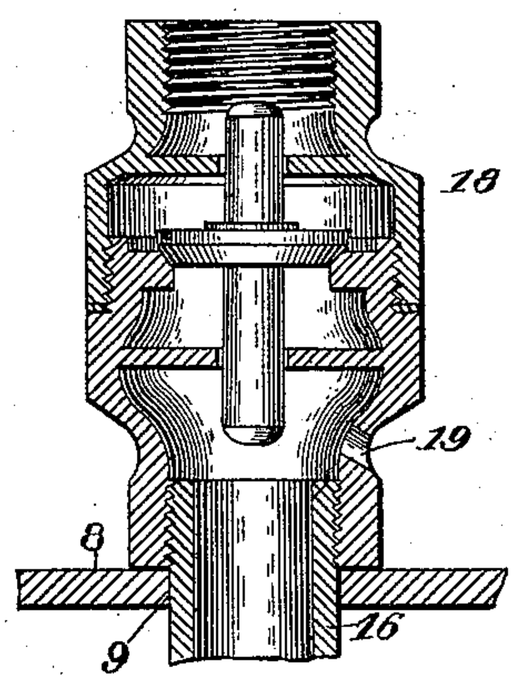


Fig. 3.



Witnesses
P. L. Mockabee
D. B. Hollinger

Inventor
Joseph L. Welshans.

By his Attorneys,
Church & Co.

UNITED STATES PATENT OFFICE.

JOSEPH L. WELSHANS, OF OMAHA, NEBRASKA.

WATER-FILTER.

SPECIFICATION forming part of Letters Patent No. 574,858, dated January 5, 1897.

Application filed March 23, 1896. Serial No. 584,529. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH L. WELSHANS, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented a new and useful Water-Filter, of which the following is a specification.

This invention relates to water-filters; and it has for its object to provide a new and useful filter of this character having simple and efficient means for the thorough filtration of water for domestic or other purposes without the absorption of the impurities into the pores of the filtering medium or stone, and also providing means for automatically washing or relieving the exterior face of such filtering medium or stone from accumulations of impurities separated out of the water.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the drawings, Figure 1 is a vertical sectional view of the water-filter constructed in accordance with this invention. Fig. 2 is a cross-sectional view on the line 2 2 of Fig. 1. Fig. 3 is a detail sectional view on the line 3 3 of Fig. 1.

Referring to the accompanying drawings, the numeral 1 designates a cylindrical filter-casing, preferably made sectional and consisting of the separate upper and lower sections 2 and 3, joined together at their meeting ends by a screw-joint 4, and the upper of which sections 2 is provided at its closed top end with a wrench-nut 5, to which is adapted to be fitted a suitable wrench to provide for screwing and unscrewing the two sections of the casing. The sectional filter-casing 1 is preferably supported in an upright position by providing the lower section 3 of the casing at one side thereof with a pair of vertically-alined hooks 6, adapted to detachably engage with the flanged hanger-brackets 7, suitably attached to a wall or other stationary object.

Clamped in position between the meeting ends of the upper and lower sections of the casing 1 is a horizontal partition-plate 8, provided with a central pipe-opening 9, and on its lower side with a depending annular retaining-flange 10, which embraces the top edge of a cylindrical filter-stone 11, which is sufficiently porous to allow water to be forced therethrough under pressure, while at the same time not allowing impurities to work through the pores. The cylindrical filter-stone 11 is disposed entirely within the lower section 3 of the casing, and is of a smaller diameter than the same in order to leave an annular water-space between the exterior of the stone and the inner sides of the lower section of the casing. The stone 11 is provided with a central longitudinal bore 12, and is seated at its lower end in a flanged supporting-plate 13, having a central interiorly-threaded upwardly-disposed collar 14 projecting into the lower end of the bore of the stone and receiving the lower threaded end 15 of the vertically-disposed circulating-pipe 16. The circulating-pipe 16 is of a smaller diameter than the bore 12 of the filter-stone, and is provided throughout its length with a series of perforations 17, communicating with the said interior bore 12 of the stone.

The upper end of the pipe 16 is extended through the central pipe-opening 9 of the partition-plate 8 and has fitted on said upper extremity above said plate a check-valve 18, which allows the free flow of water from the lower stone-holding section 3 of the casing into the upper section of the casing, which forms an enlarged filtered-water and compressed-air chamber. The said check-valve 18 is of an ordinary construction with the exception of being provided with a return-port 19, which pierces the casing of the check-valve below the valve-plate therein to allow the return flow of water from the filtered-water chamber back into the circulating-pipe 16 for a purpose to be presently explained, and at this point it is to be noted that the manner of arranging the circulating-pipe 16 and connecting the check-valve 18 therewith provides simple and efficient means for firmly and removably supporting the filter-stone in position.

The lower section 3 of the casing is provided at one side with a water-inlet pipe connection 20, with which a connection is made with an ordinary service-pipe to provide means for directing water under pressure into the lower portion of the filter-casing, and at

the extreme lower end of the casing the latter is provided with a drain-pipe connection 21, which is brought into play when the filter is being washed out and for drawing water for purposes for which filtered water is not required. The upper section 2 of the casing, inclosing the filtered-water chamber, is of a sufficient size to accommodate any desired amount of water and is provided near its lower end with a pipe connection 22 to allow the filtered water to be drawn off through the medium of an ordinary faucet, and at a suitable point above the screw-joint 4 the upper casing-section 2 is provided with an air-cock 23, which is brought into play to admit a fresh supply of air to the upper casing-section whenever required.

In the operation of the filter the water enters at the inlet 20 under pressure and, passing through the stone 11, enters the pipe 16 and discharges through the check-valve 18 into the filtered-water chamber above the partition-plate 8, and the impurities are removed from the water by the stone and are caught and held on the surface of the latter, as will be readily understood. The filtered water will continue to pass up into the upper section of the casing, thereby compressing the air therein, until the pressure of air within the top part of the upper section of the casing equals the pressure of water in the supply-pipe, at which time the filtering action will cease until a sufficient amount of filtered water has been drawn off to relieve the air-pressure.

When the pressure in the supply or service pipe is reduced by water being drawn from other fixtures in the house or system or from other causes, the pressure of air within the upper end of the casing above the filtered water will force the water back through the return-port 19 of the check-valve into the pipe 16 and, passing back through the stone, will loosen the sediment or impurities on the surface thereof and cause such sediment or impurities to fall or wash to the bottom of the casing, from which the same may be readily drawn off, as desired, from the drain-pipe 21. So it will therefore be seen that the cleaning of the filter-stone is automatic whenever the pressure of the water-supply is reduced in the manner described. Whenever the air within the upper part of the casing above the filtered water becomes exhausted by passing out with the filtered water through the outlet 22 by opening the air-cock 23 and the said outlet 22 at the same time, a proper supply of air may be restored to the upper part of the casing above the partition-plate 8.

Changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a water-filter, a cylindrical casing, a partition-plate fitted within the casing intermediate of its ends, a cylindrical filter-stone arranged below the partition-plate, a perforate circulating-pipe arranged within the filter-stone and carrying at its lower end a supporting-plate for the lower end of the stone, and a check-valve casing detachably fitted on the upper end of the circulating-pipe above said partition-plate and serving to clamp the filter-stone between said supporting-plate and the under side of the partition-plate, substantially as described.

2. In a water-filter, an upright cylindrical casing having an intermediately-located partition-plate, a filtered-water outlet above said plate, a bottom drain-opening, and an inlet-opening below the plate, a cylindrical filter-stone supported below said plate and having a longitudinal bore, a perforate circulating-pipe arranged within the bore of the filter-stone and projecting at its upper end above the partition-plate, and a check-valve fitted on the upper end of the circulating-pipe above the partition-plate and provided in its casing below the valve proper with a return-port, substantially as set forth.

3. In a water-filter, an upright cylindrical filter-casing having a partition-plate between its upper and lower ends, and suitably-arranged inlet, outlet and drain openings, said partition-plate being provided with a central pipe-opening and a depending annular retaining-flange, a cylindrical filter-stone fitted at its upper end with said retaining-flange and having a longitudinal bore, a perforate circulating-pipe arranged within the bore of the stone and carrying at its lower end a flanged supporting-plate embracing the lower end of the stone, and a check-valve fitted on the upper end of said pipe above the partition-plate and provided in its casing below the valve proper with a return-port, substantially as set forth.

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

JOSEPH L. WELSHANS.

Witnesses:
WM. J. WELSHANS,
GEO. P. SMITH.