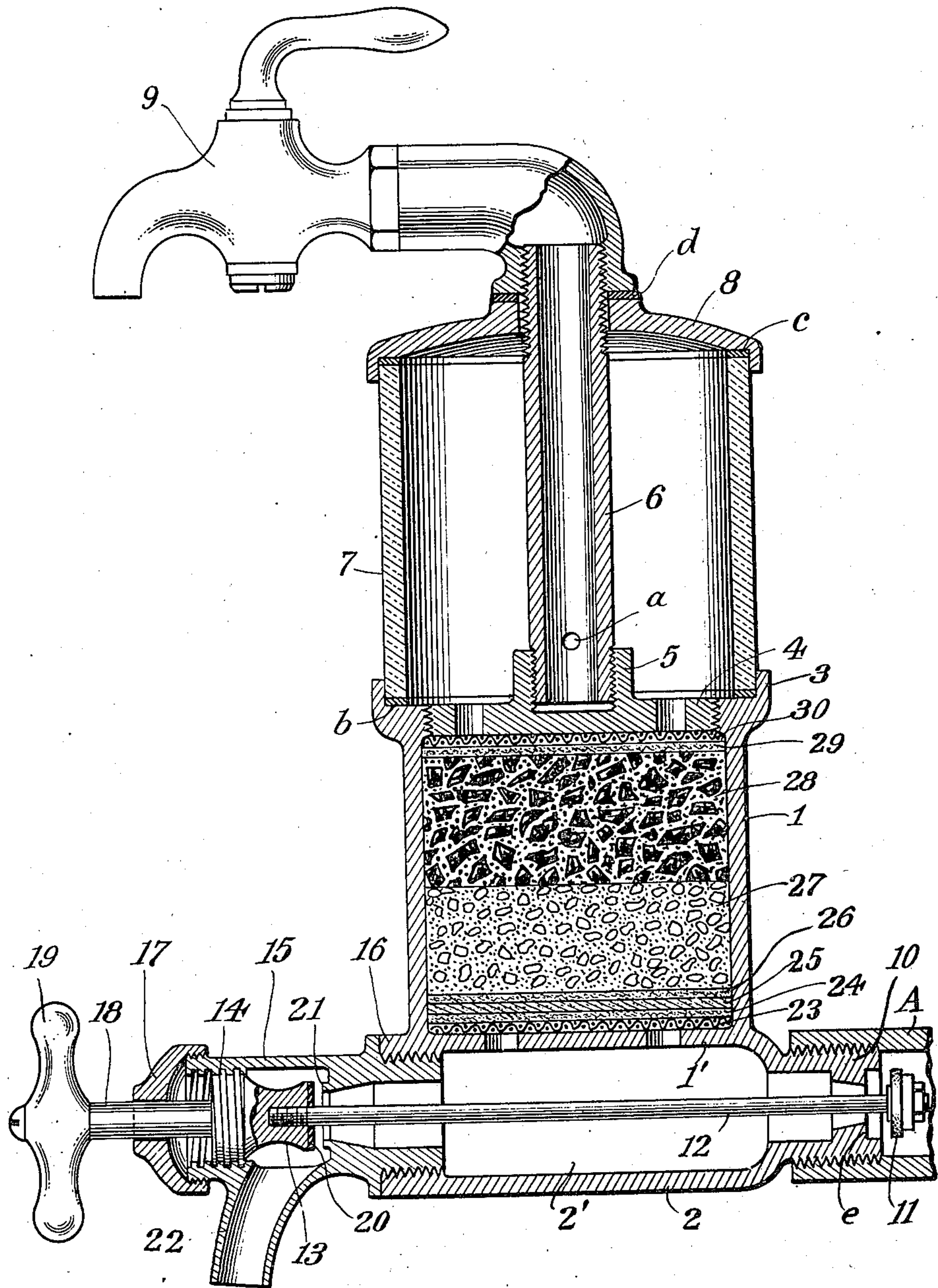


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FILTER.

APPLICATION FILED NOV. 28, 1914.

1,167,094.

Patented Jan. 4, 1916.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

VALENTINE MÜLLER, OF NEW YORK, N. Y.

## FILTER.

1,167,094.

Specification of Letters Patent.

Patented Jan. 4, 1916.

Application filed November 28, 1914. Serial No. 874,371.

*To all whom it may concern:*

Be it known that I, VALENTINE MÜLLER, a citizen of the United States, and a resident of the borough of Bronx, in the city, county, and State of New York, have invented new and useful Improvements in Filters, of which the following is a specification.

This invention relates to improvements in filters, and particularly that type of filter for purifying water supplies in which the purified effluent is tapped directly from a storage reservoir when required for use.

The objects of the invention are the production of an economical and sanitary filter and in which the filter bed can be rapidly and uniformly cleansed by the return flow of water therethrough, and also the elimination of suction in the storage reservoir during such cleansing operation.

The invention is fully set forth and described in the accompanying specification and drawing forming a part thereof in which the figure shown is a vertical section of the filter, a portion thereof being shown in elevation.

Referring to the drawing and the construction shown therein, the reference numeral 1 represents the casing of the filtration chamber, the same being provided with an integral perforate false bottom, 1' also a supplemental integral casing 2 at the lower end thereof, which forms the raw water inlet chamber 2', and a circumferential upwardly projecting flange 3. A perforate metallic plate 4 is threaded in the upper end of said casing 1, the same being provided with an upwardly extending central boss 5 adapted to receive a tubular support 6 having one or more openings, such as indicated by the reference letter (a), adjacent the bottom thereof and above said boss. The glass reservoir 7 is supported within the said annular flange 3, the same being tightly fitted therein by means of an annular gasket (b). Said glass reservoir is held in position by means of a cap 8 which spans the top thereof and is threaded over the said tubular support 6, being tightly locked thereto by means of a faucet 9, which is also threaded to said tubular support. As shown, another annular gasket (c) is interposed between said cap and said reservoir and a gasket (d) is interposed between said cap and the base of said faucet, in order to seal the same against the escape of liquid. The said supplemental casing 2 is provided with a hollow threaded

boss 10 adapted to be connected with the inlet pipe A as shown, and said boss is provided with an annular seat e adapted to receive the valve 11 mounted upon a stem 12. At the opposite end of said stem 12 is threaded a spool 13 which is provided with a peripheral thread 14 adapted to engage with a corresponding thread upon the inner surface of the union 15, threaded into a second boss 16 of said supplemental casing. The outer end of said union 15 is equipped with a cap 17 which is threaded thereover and through this cap projects the shank 18 carrying the faucet grip 19. The said shank 18 is secured to one end of said spool 13 and the opposite end of the said spool 13 is threaded upon the aforesaid stem 12. Furthermore, a washer or disk valve 20 is secured to said innermost end of said spool 13, the same being adapted to seat against an elevated annular valve 21 and thereby control the flow of water through the outlet nozzle 22, depending upon whether or not said valve is in engagement with said seat.

The filter proper is preferably built up in the following manner: Upon the false perforate bottom 1' is laid a screen 23, for example 120 mesh, then a layer of felt 24, then a layer of compressed asbestos wool 25, and above this another layer of felt 26. The filtering medium comprises a body of crushed quartz or other suitable mineral aggregate as indicated by the numeral 27, which is positioned in the casing above the upper of said layers of felt, and above this aggregate is positioned a layer of finely divided mineral charcoal as indicated by the reference numeral 28, the said filtering medium being held in position by a layer of felt 29 and a second screen 30 corresponding to the screen 23. As shown the filter medium is adapted to completely fill the space between the said layers of felt at the top and bottom of said medium respectively.

The operation of the apparatus above described is as follows: After the cock 9 is closed, the valve 11 is unseated and the valve 20 seated by turning the grip 19 in a clockwise direction. Thereupon the raw water enters from the main A into the raw water chamber 2', and its escape through the nozzle 22 being prevented, it is forced upwardly by pressure in the main through the first false bottom 1', thence through the filter bed and the perforate plate 4 into the reservoir 7, wherein the effluent will collect. By



opening the cock 9 the said effluent may be drawn off, the said cock being in communication with the tubular support 6 which receives said effluent through the aperture or apertures (a). When it is desired to cleanse the filtering medium it is merely necessary to open the valve 20 into the position shown in the drawing without sealing the valve 11, whereupon the purified water effluent in the reservoir, owing to the pressure of the air which will be confined above the effluent therein, will rapidly be forced downwardly through the said filtering medium and upon issuing therefrom will unite with the raw water which cleanses the bottom of the false bottom 1', and thence said stream consisting of the mixed raw and purified water will pass outwardly through the cock 22. Preferably in order to effect proper cleansing of the filter bed, the capacity of the reservoir should be larger than the capacity of the filtration chamber, as thereby an amount of water can be forced through the filter bed which is in substantial excess of the amount necessary to thoroughly subject every portion of the same to the flushing action of purified effluent.

The herein described construction permits of the inlet to the raw water chamber being periodically cut off without closing the outlet thereto, by a single cock such as indicated by the reference numeral 19. As a consequence, if said valve 11 is seated the air can pass up through the filter and through the siphon tube in the reservoir into the partial vacuum which will exist above the same, whereas if the water in said main is continually in communication with the raw water chamber 2', it is impossible for the air to enter said water reservoir in order to replace any air removed therefrom by entrainment.

Having thus described my invention what I claim and desire to secure by Letters Patent is:—

In a filter, the combination comprising a casing provided with a raw water chamber the entire interior of which is substantially free from obstructions projecting thereinto

from the inner surface of the walls thereof, said chamber being provided with an inlet opening and valve controlled outlet opening, a purified water reservoir adapted to confine in its upper portion a body of compressed air substantially equal in cross sectional area to the maximum cross sectional area of the reservoir, a filtering chamber intermediate said raw water chamber and said purified water reservoir, the said filter chamber being of smaller capacity than the said purified water reservoir, and having a cross sectional area not exceeding that of the said reservoir, fibrous pressure distributing means extending completely across each end of said filter chamber, a granular filtering medium interposed between said fibrous pressure distributing means and completely filling the space therebetween, a siphon, the lower end of which is in communication with the lower end of said reservoir and which is adapted to tap off a body of water stored in said reservoir at a point adjacent the bottom of said water, whereby the escape of the confined air above said water is substantially prevented during the efflux thereof, cut-off means for sealing said siphon and for optionally preventing the escape of water or air therethrough, means for sealing the inlet to said raw water chamber against the admission of raw water thereto without simultaneously obstructing the outlet from said raw water chamber, whereby the supply of air in said reservoir may be replenished at will when the pressure therein falls below a predetermined minimum, and perforate metal plates forming the opposite ends of said filter chamber and adapted to resist distortion and hold said filtering medium permanently in place irrespective of the pressure upon said plates.

Signed at New York, in the county of New York and State of New York, this 24th day of November, 1914.

VALENTINE MÜLLER.

Witnesses:

W. B. MORTON,

W. H. SWENARTON.