(No Model.)

E. BURHORN.

FILTER.

No. 457,025. Patented Aug. 4, 1891.

FIG. 1.

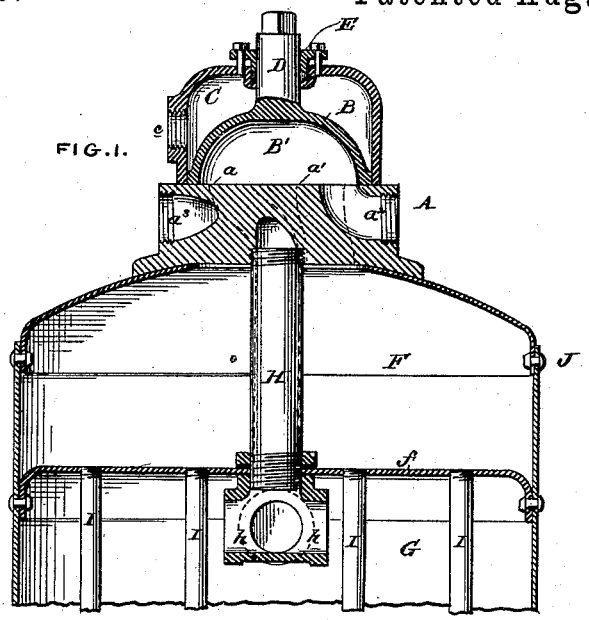


FIG. 6.

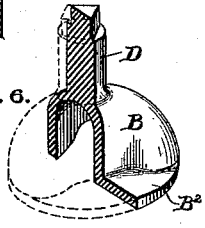


FIG. 2.

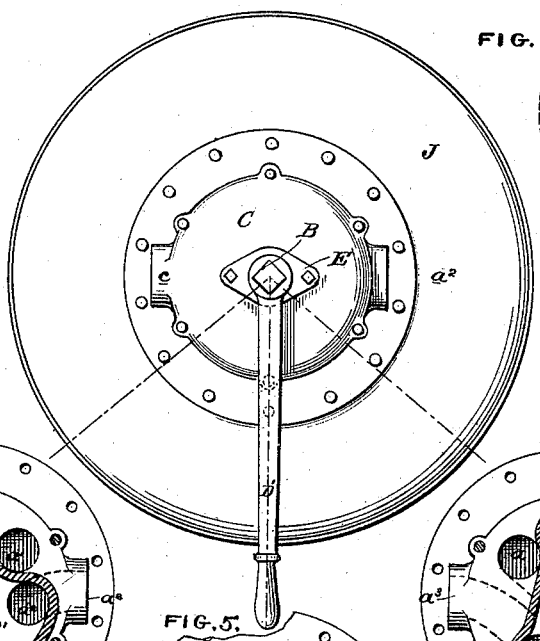


FIG. 4.

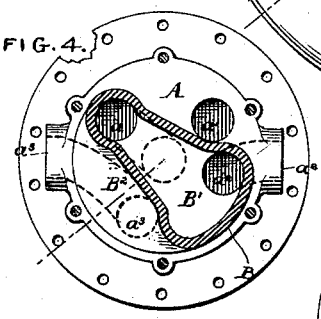


FIG. 5.

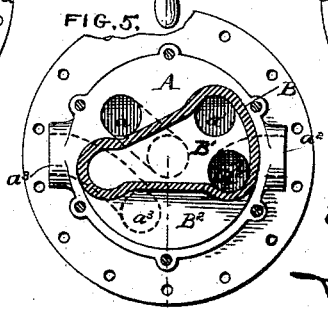
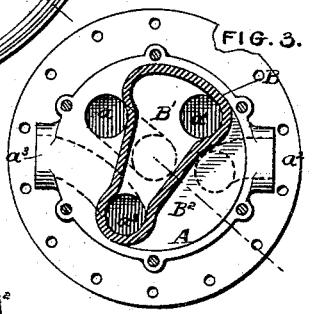


FIG. 3.



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FILTER.

SPECIFICATION forming part of Letters Patent No. 457,025, dated August 4, 1891.

Application filed April 12, 1889. Serial No. 307,022. (No model.)

To all whom it may concern:

Be it known that I, EDWIN BURHORN, of the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Filter-Valve, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to the construction of a valve for governing the flow of water through a filter and enabling the current to be reversed and the filter cleaned at will, my object being to provide a valve especially fitted for this use and which can be easily operated and with little tendency to get out of order.

My device will be best understood after a description of the drawings, and its novel features are hereinafter clearly set forth in the claims.

In the drawings, Figure 1 is a sectional elevation through a filter having my improved valve. Fig. 2 is a plan view of said filter; and Figs. 3, 4, and 5, plan views of the valve in place on its seat, with its upper projecting dome cut away. Fig. 6 is a perspective view, partly in section, of the flat-faced valve.

A is the valve-seat, having a flat face, in which four conduit-passages a a' a^2 a^3 are formed at equal distances from the center about which the valve turns and at four angles of a heptagon described around said center. The passages or ports a' a^2 are at adjacent angles and the ports a a^3 at alternate angles from the nearest ports and from each other. This valve-seat A is preferably secured, as shown, upon the top of the filter-casing J, which is divided by a partition f into a filter-chamber G and a settling or reservoir chamber F, the two chambers being connected by pipes I I, &c., which pass through the partition f and terminate near the bottom of the filter-chamber G, having openings at their lower ends, through which the water can enter them. This particular construction is shown, not because it is of the essence of my invention, but simply as an illustration of a filter to which my invention is applicable. One of the ports in valve-seat A a is connected with the filter-chamber in the drawings by means of a pipe H, having a T at its end, through the openings h h of which the water enters the chamber. Another port a' is connected with the delivery end of the filter—as shown, the reservoir F. A third port a^2 leads to waste, and the fourth a^3 to the delivery-main. (Not shown.)

B is the valve, having a flat face to fit on the valve-seat A and arranged to have a rotary motion upon the center, around which the ports are grouped. A portion B′ of the valve is formed into a hollow dome, on one side of which extends the flat flange B^2, which should have an outline bounded by a circular arc described from the center of the valve, while the other side of the valve is recessed, as shown—that is, does not extend beyond the dome, which is of the wedge shape shown, one end being large enough to extend over one port without covering ports situated at alternate angles of the heptagon, while the other end is large enough to cover two adjoining ports, as shown, the length of the dome being sufficient to include within it ports on opposite sides.

C is the valve-casing, in which is formed an entrance-port c for water, and at the top of which a stuffing-box E is preferably provided to give exit to a valve-rod D, by which I prefer to actuate the valve B.

D′ is a lever for moving the valve.

The operation of my valve is as follows: When the valve is in the position shown in Fig. 3, the water entering through c passes out of chamber C through port a to the filter, and, returning, enters the dome of the valve through port a', passing out through port a^3 to the delivery-main, the port a^2 being covered and closed by flange B^2. To reverse the current of water to clean the filter, the valve is moved to the position shown in Fig. 4. The water entering chamber C then passes into the normal delivery end of the filter through port a', returning enters the dome of the valve through port a, and passes out through port a^2 to waste, the delivery-port a^3 being closed by flange B^2. When the filter has been sufficiently cleaned, the valve is turned to the position shown in Fig. 5, the water now again passing through port a into the filter, and, returning, enters the valve-dome through a', but still passing out through the waste-opening a^2 and the port a^3, being still covered

by flange B^2. This last position of the valve is maintained until the unfiltered water in the filter has been washed out and the valve then again returned to its normal position, as shown in Fig. 3. The three positions of the lever D′ are indicated in Fig. 2 and by the dotted lines in Figs. 3, 4, and 5.

I am aware that in Haynes's patent, No. 282,313, a flat valve-seat is shown with perforations formed in it and in combination with a double-domed valve having a closing-flange and an opening to permit connection between a perforation and the valve-chamber. In this device, however, the dome is situated on the edge of the valve, while my single dome extends across the valve, and is thus enabled to make connections between perforations in the valve-seat which cannot be made by the Haynes construction. The important adjustment for filtering to waste, for instance, cannot be made by the Haynes valve.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a filtering-tank provided with a pipe for conveying water to be filtered to the filter-bed, of a valve-casing with an inlet-pipe, a waste-pipe, and a pure-water-discharge pipe, a circular valve-seat having four ports, one port communicating with the first-mentioned pipe, one port communicating with the filter-bed, one port communicating with the pure-water-discharge pipe, and one port communicating with the waste-water-discharge pipe, and a rotating valve having a cup portion to provide communication between two of said ports, and a port communicating with either of the two remaining ports, said ports in the valves and seat being arranged so that water passing through the filter in either direction may be discharged therefrom into the waste-pipe and so that filtered water may also be discharged from the filter to the pure-water-discharge pipe.

2. A valve for a filter, having in combination a flat seat A, with conduits a a' a^2 a^3 leading into it and opening on its flat face, as described, a valve B, having a flat face, a cavity B′, formed therein and extending across the valve, a flange B^2 on one side of said cavity and a recess on the other side, and a valve-casing C, having a passage c formed in it, all substantially as and for the purpose specified.

3. A valve for a filter, having in combination a flat seat A, with conduits a a' a^2 a^3 leading into it and opening on its flat face, as described, a valve B, having a flat face, a cavity B′, formed therein so as to extend across the valve, a flange B^2 on one side of said cavity and a recess on the other side, a valve-spindle D, secured to the top of valve B and extending through the valve-casing, and a valve-casing C, having a passage c formed in it, all substantially as and for the purpose specified.

EDWIN BURHORN.

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