

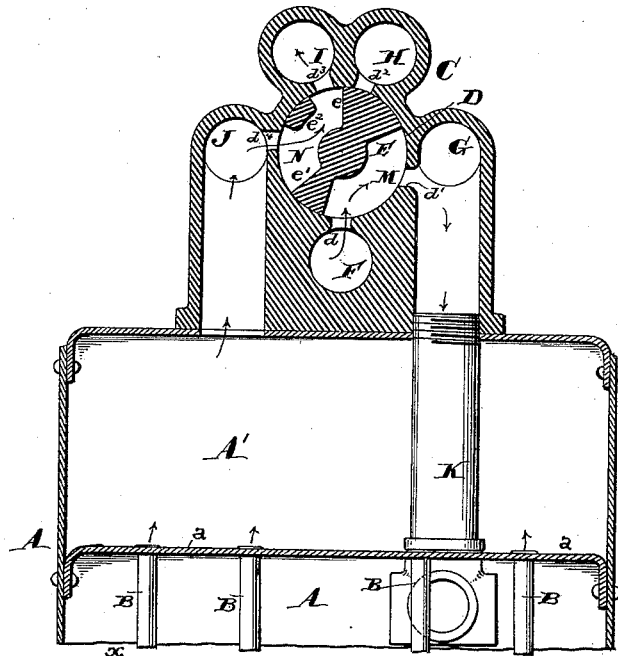
(No Model.)

E. BURHORN.  
FILTER VALVE.

No. 423,122.

Patented Mar. 11, 1890.

FIG. 1.



**FIG. 2.**

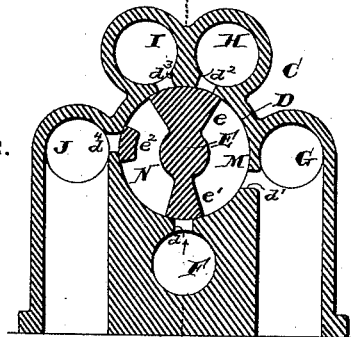


FIG. 3.

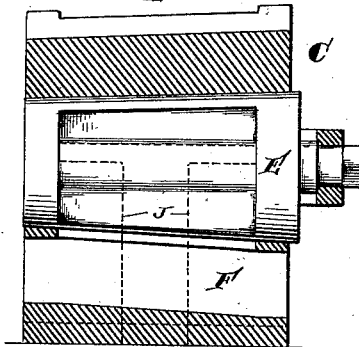


FIG. 4.

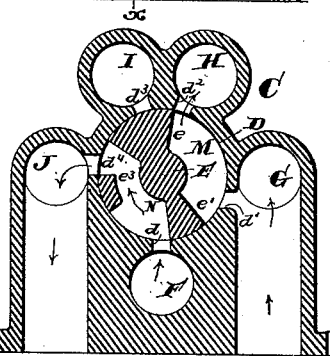
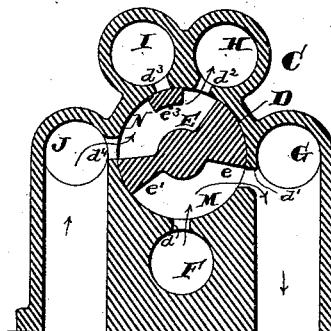


FIG. 5.



**WITNESSES:**

Henry Diney  
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Francis T. Chambers

# UNITED STATES PATENT OFFICE.

EDWIN BURHORN, OF PHILADELPHIA, PENNSYLVANIA.

## FILTER-VALVE.

SPECIFICATION forming part of Letters Patent No. 423,122, dated March 11, 1890.

Application filed June 21, 1889. Serial No. 315,076. (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 filters by which the flow of water can be reversed at will, or, if desired, shut off; and my object is to provide a valve of this kind which shall be easily operated and have little tendency to get out of order.

My new device will be best understood after a description of the drawings, and its novel features will be hereinafter clearly pointed out in the claim.

Reference being now had to the drawings, Figure 1 is a central vertical section through my new valve set for filtering, showing also the upper portions of a filter, to which it is attached. Fig. 2 is a similar view with the valve set to close the flow of water. Fig. 3 is a sectional view of the valve-casing on the line *x x*, showing also, but not in section, the conical cock or plug. Fig. 4 shows the valve set to reverse the current of water through the filter and allow the water to flow to waste; and Fig. 5 shows the valve set to direct the water through the filter in the normal direction, but allow it to flow to waste, instead of into the service-pipe, as in Fig. 1.

A is the filter, A' being the chamber into which the filtered water flows, and A<sup>2</sup> the filtering-chamber, *a* being the diaphragm, which divides chambers A' and A<sup>2</sup>, and B B, &c., pipes leading from the bottom of chamber A<sup>2</sup> into chamber A'.

C is the valve-casing, having a conical seat D for the valve, in which seat are formed ports *d*, *d'*, *d*<sup>2</sup>, *d*<sup>3</sup>, and *d*<sup>4</sup>, leading, respectively, into the supply-pipe F, a pipe G, connected to the top of the filter-chamber, the waste-pipe H, the service-pipe I, and the pipe J, leading from the water-reservoir A'. The ports *d* *d'*, &c., are arranged as shown, and the conical valve E, which turns in seat D, has a partition formed across it by the flanges *e* and *e'*, of which *e* is broad enough on its face to close both the ports *d*<sup>2</sup> and *d*<sup>3</sup>, while the face of *e'* is only broad enough to cover

one port *d* at a time. Two chambers M and N are thus formed in the valve E. A bar *e*<sup>2</sup>, having a face broad enough to cover a single port, is extended across the chamber N, as shown. The relative arrangement of the ports *d* *d'*, &c., and of the arms *e* *e'* *e*<sup>2</sup> are important features of my invention.

When the valve is in the position shown in Fig. 1, the water passes from supply-pipe F into chamber M, thence through port D' into pipe G, and thence through connecting-pipe K into filter-chamber A<sup>2</sup>, from the bottom of which it rises through pipes B into chamber A', and thence through pipe J it passes into chamber N of the valve, and out through port *d*<sup>3</sup> to the service-main I. The waste-port *d*<sup>2</sup> is in this position of the valve covered by arm *e*. When I desire to shut off the flow of water, I turn the valve into the position shown in Fig. 2, the arm *e'* closing the service-port *d* and the cross-bar *e*<sup>2</sup> closing the delivery-port *d*<sup>4</sup>, while ports *d*<sup>2</sup> *d*<sup>3</sup> are closed by arm *e*.

To reverse the current of water through the filter, I turn the valve into the position shown in Fig. 4. The water then enters from port *d* into chamber N, passes through port *d*<sup>4</sup> and pipe J into chamber A', thence through pipes B, chamber A<sup>2</sup>, pipes K and G, and port *d'* into chamber M, and out through port *d*<sup>2</sup> to waste-pipe H, the service-pipe being closed by arm *e*. After reversing the current it is desirable that after resuming the normal direction of flow the water should be run to waste until the filter is cleaned of the unfiltered water, and this I accomplish by turning the cock to the position shown in Fig. 5, which causes the water to flow as described with reference to Fig. 1, except that the service-pipe is closed by bar *e*<sup>2</sup> and the arm *e* thrown over so as to open the waste-port *d*<sup>2</sup>.

In an application filed by me April 12, 1889, Serial No. 307,022, I have described a valve somewhat similar in principle to the one which forms the subject-matter of this application; but said valve was in the form of a disk working on a flat seat, and while the construction there shown has been found efficient in practice it is inconvenient where very large ports are required, while by my present device it is not necessary to increase the diameter of the valve for different sizes

of ports, the difference being provided for by increasing the length of the ports  $d$   $d'$ , &c. The pipe or conduit sections F, H, and I, &c., are preferably made to open at each end of  
5 the valve-casing C, which they surround, so that connections may be made with them at either side, the end not connected being closed by a plug or cap.

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

A filter-valve having a conical seat D, with ports  $d$ ,  $d'$ ,  $d^2$ ,  $d^3$ , and  $d^4$  leading from it and arranged as specified, in combination with a conical cock E, divided into chambers M and  
15 N by arms  $e$   $e'$  and having a bar  $e^2$  extending across chamber N, said arms and bar being arranged and constructed as described.

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Witnesses:

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