(No Model.) 3 Sheets—Sheet 1.

J. W. HYATT.

FILTER.

No. 293,742. Patented Feb. 19, 1884.

Fig. 1.

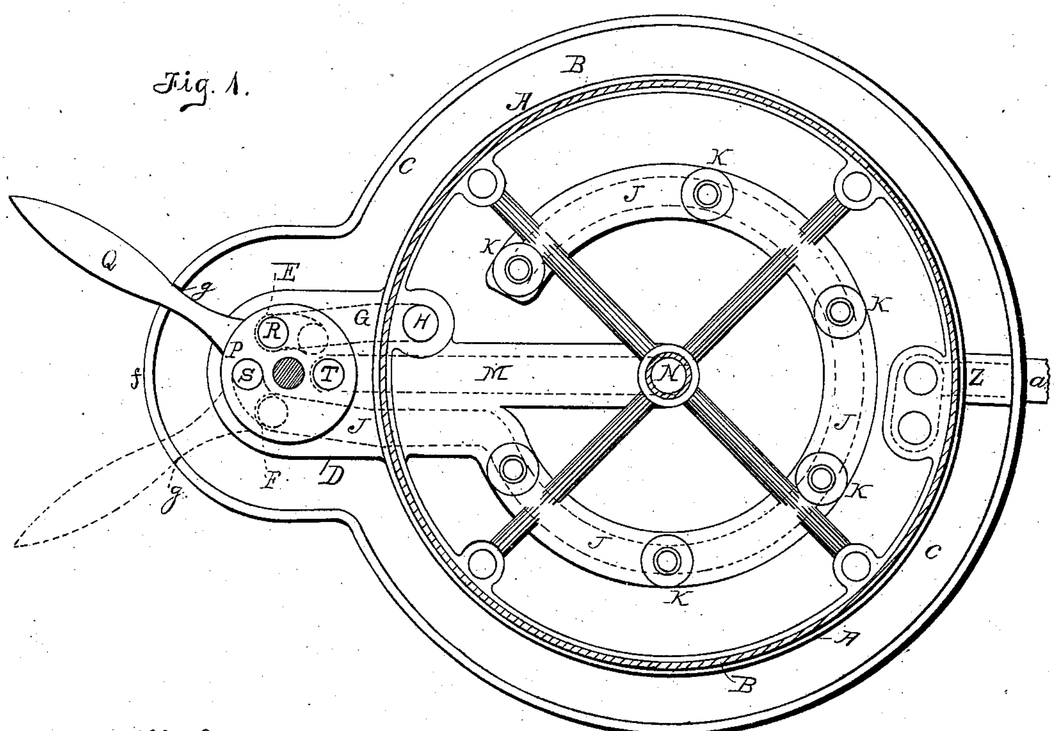


Fig. 2.

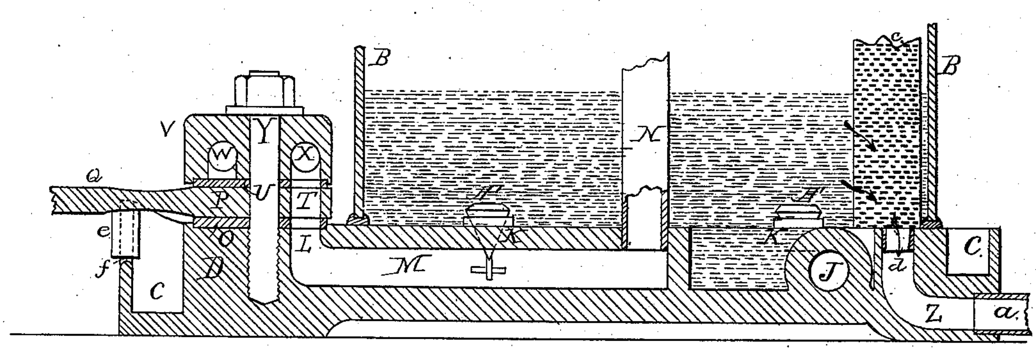
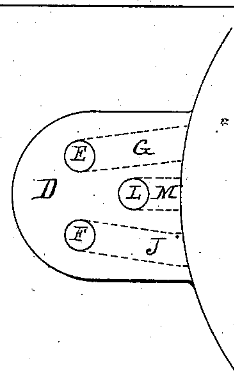


Fig. 3



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By his Attorney,
Rowland Cox.

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.)

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Fig. 4.

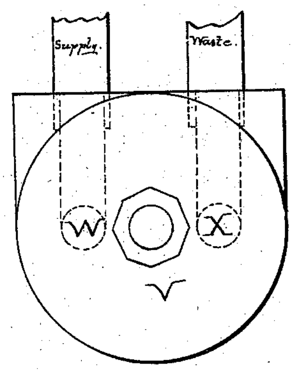


Fig. 5.

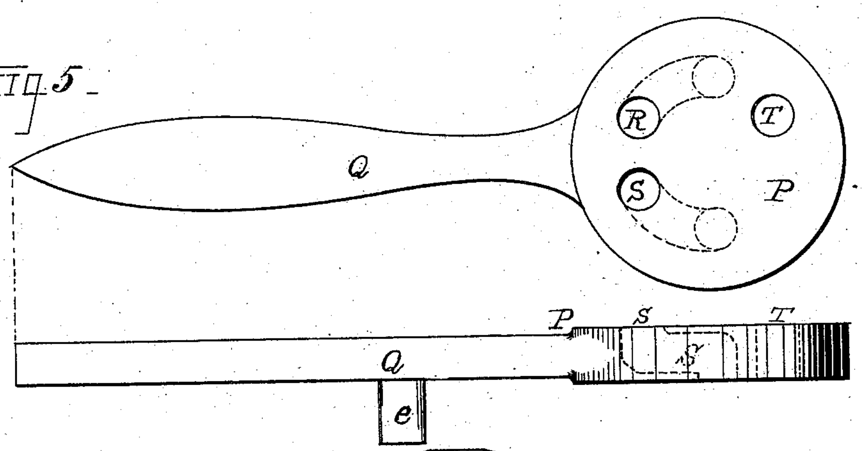
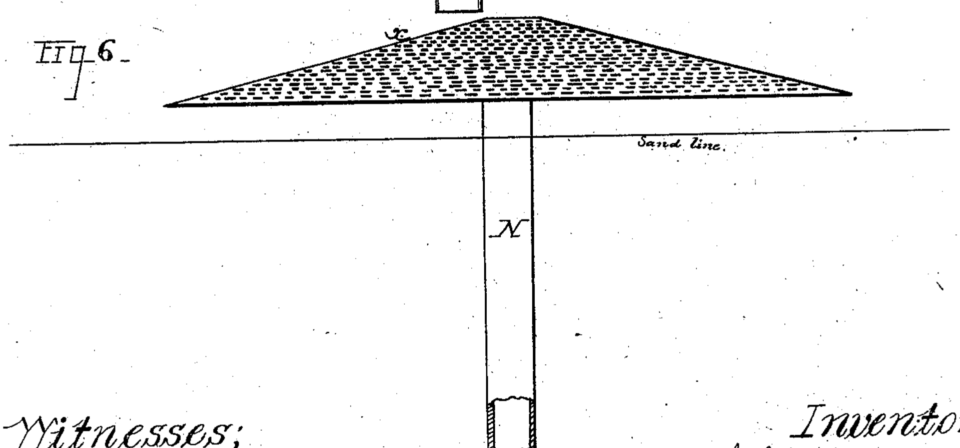


Fig. 6.



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(No Model.) 3 Sheets—Sheet 3.

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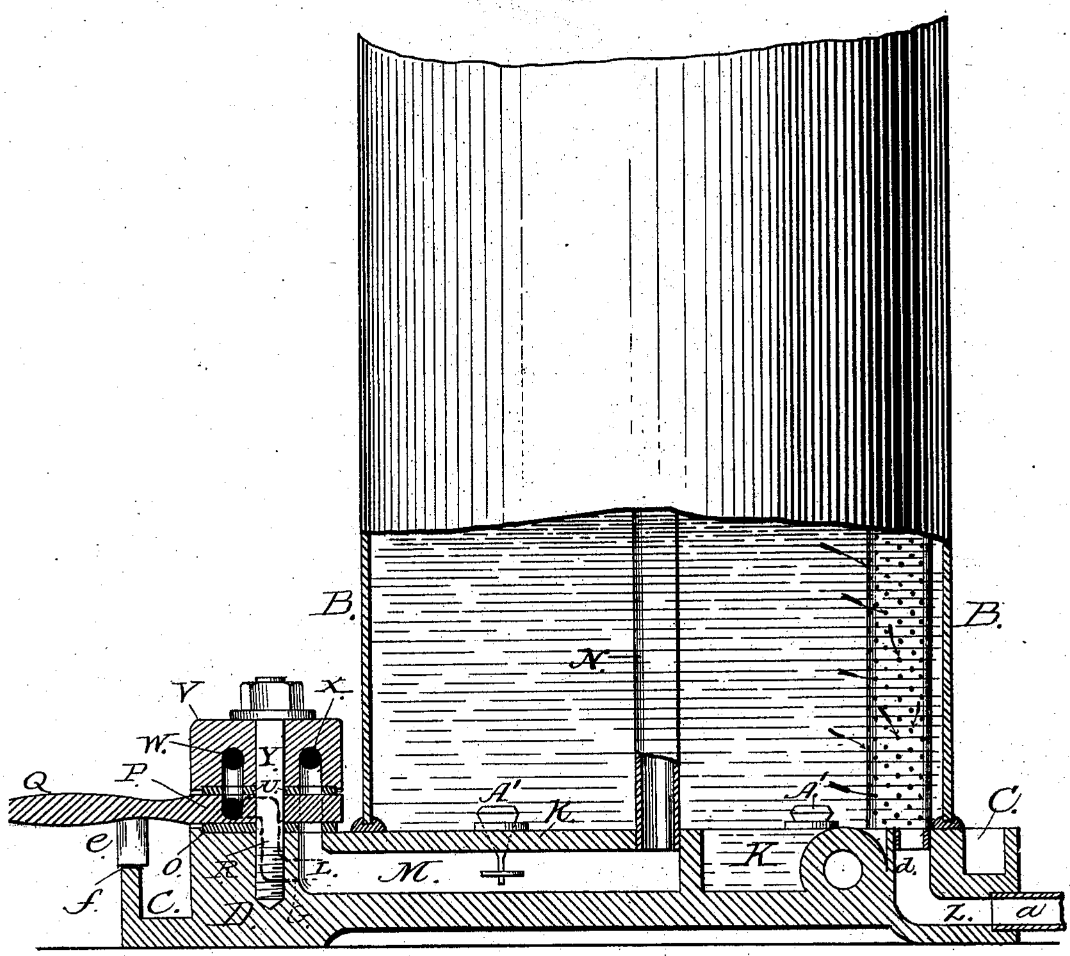
Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN W. HYATT, OF NEWARK, NEW JERSEY.

FILTER.

SPECIFICATION forming part of Letters Patent No. 293,742, dated February 19, 1884.

Application filed December 28, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. HYATT, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Filters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to an improvement in filters; and it consists in the mechanism hereinafter described for regulating the entrance of water to be filtered, or for use in washing the elements of the filter-bed.

The invention particularly relates to the construction of the base of the filter and to a novel valve, whereby the water may either be caused to pass through the bed of filtering material for the purpose of cleaning it, or it may be directed through other channels and employed for washing the bed.

The invention will be understood more fully from the description hereinafter presented, reference being had to the accompanying drawings, in which—

Figure 1 is a top view of the base of the filter, illustrating the passages leading from the valve, the top section (lettered V) of the valve being removed. Fig. 2 is a central vertical longitudinal section of same, the cores being illustrated in full lines and the upper section of the valve being in place. Fig. 3 is a top view of the lower section (lettered D) of the valve. Fig. 4 is a top view of the upper section of the valve, the cores running through which being indicated by dotted lines. Fig. 5 is a plan view and an edge view of the valve-plate Q, enlarged for purposes of illustration. Fig. 6 is a side elevation of the central washer-pipe, having upon its upper end the perforated cone. Fig. 7 is a central vertical section of the valve, showing the ports W, R, and E in communication with each other, the plate P in this view being turned to a position opposite to that shown in Fig. 2.

The base of the filter will be of cast-iron, and will contain the annular vertical flange A, upon which the boiler-iron B, composing the cylinder or shell of the casing, is secured. Beyond the vertical flange A the base will, by preference, have formed about and cast with it the trough C.

Upon one side of the filter, between the outer edges of the trough C and the flange A, will be formed the projection D, in which are formed the inlets E F, the former of which leads into the passage G, which has an outlet at H within the filter and at one edge thereof, as indicated in Fig. 1.

At the outlet H, for the unfiltered water to enter the filter, will be provided, preferably, a valve similar to that lettered A′, and described hereinafter, which valve will permit the water to enter the bed of filtering material, and at the same time prevent the elements thereof from escaping into the passage G. The port F leads into the passage J, which, by preference, passes through the base of the filter in a line concentric with the outline of the filter, as indicated.

At suitable points on the passage J openings K are provided for permitting the water to escape into the filter-bed. These openings K will preferably be provided with valves A′, to permit the entrance of the water into the filter without allowing the sand to escape.

In the lug or projection D is also provided a port, L, which leads into the passage M, which passes to the center of the base of the filter, and is connected with the vertical pipe N. The pipe N passes upward through the filter-bed, and is provided on its upper end with a plate of perforated metal constructed into the contour of a hollow cone.

Upon the projection or lug D, containing the ports E F L aforesaid, is placed a packing of leather or other suitable material, O, having apertures corresponding with the said ports, and upon this packing is placed the rotating valve P, having a handle, Q, by which it may be operated. The valve P is provided with three ports, R S T, which are so arranged that the ports S T may be thrown into communication with the ports F L, the port R remaining closed, or that the port R may be in register with the port E, as shown in Fig. 7, the ports S T being thereby closed, according as the valve P, by its handle Q, is drawn either to the left or right. In Fig. 2 of the drawings I have illustrated the valve turned to form a communication with the ports F L and their connecting-passages, hereinbefore described. This is the condition of the valve P when it is desired to wash the filter-bed, the supply for the unfiltered water being cut off by the removal of the port R from communication with the port E.

Upon the valve P is placed another layer of packing, U, upon which is arranged the block V, containing the inlet-port W and outlet X, the inlet-port being for the supply of unfiltered water, and the outlet-port for the escape of water which has been used in cleaning the filter-bed. The ports W X, formed in the block V, lead to the ports S T, formed in the valve P, and with the ports F L, formed in the projection D, during the operation of washing the bed, when the valve-plate P is turned to effect this result, which is the condition of the apparatus illustrated in full lines in Figs. 1 and 2. When the valve-plate P is turned to the position indicated in dotted lines in Fig. 1, the ports W X and the ports S T will be removed from communication with the ports E L, and ports W, R, and E and the passage G will be caused to connect with each other, as shown in Fig. 7, and in this condition of the apparatus the water will enter the supply-port W, passing downward through the port R in the valve-plate P and port E in the projection D, and find its way through the passage G into the filter, whence it will pass through the bed of filtering material and be thoroughly cleansed.

It will be noted that by turning the handle of the valve-plate P in one direction the water to be cleansed is permitted to enter the filter, and when the valve-plate P is turned in the opposite direction the said supply to the passage G is cut off and the water is caused to flow through the cores M J. The valve-plate P and the block V are secured over the projection D by the bolt Y, as indicated in Fig. 2.

Upon the side of the filter opposite to the ports above described is provided an outlet for the filtered water, which consists of the passage Z, leading to the pipe *a*. The passage Z has two openings into the filter, upon which are placed cylinders of perforated metal, *c*, connected with the passage Z. The water, after it is forced through the filter-bed, enters the cylinders *c*, and passing downward through the same enters the passage Z, and is conveyed away through the pipe *a*.

Upon the lower surface of the handle of the valve-plate P is formed the projection *e*, which moves in the space *f*, formed by cutting away a portion of the trough C, and which strikes the edges *g g* at each end of the said space when the full movement of the said valve-plate P has been made either to the right or left. The ends *g g* constitute stops for arresting the movement of the valve P when the ports are in communication.

In the operation of the filter, when it is desired to filter water, the valve-plate P is turned until its handle is in the position indicated in dotted lines in Fig. 1, which causes a communication of the inlet-port W with the port R in the valve-plate P, and the port E in the projection D, whereby the water will be permitted to pass through the said ports and enter the passage G, and find its outlet into the filter-bed at H, as hereinbefore described. The water will pass through the filter-bed, being thoroughly cleansed, and will find its outlet by means of the cylinders *c*, passage Z, and outlet-pipe *a* above mentioned. After the operation of filtering has proceeded a given length of time, according to the condition of the water, the filter-bed will become foul and will require cleansing.

In order to effect the cleansing of the filter-bed, I turn the valve-plate P to the direction indicated in full lines in the drawings, which has the effect (the outlet-pipe *a* being closed) of bringing the port S into communication with the supply-port W, the said port S also communicating with the port F. This movement of the valve-plate P also brings the port T into communication with the port L, formed in the projection D, and with the port X, for the escape of the waste water. When the valve-plate P is in the condition last described, the water from the supply-port W will pass through the port S and port F into the passage J, whence it will pass beneath the filter-bed and issue therein through the openings K. The water passing into the bed from the passage J will rise through the elements thereof, thoroughly agitating and cleansing the same, and after ascending above its upper surface will enter the vertical pipe N, when it will pass into the passage M, finding its outlet through the ports L, T, and X, as shown very clearly in Fig. 2. The upward passage of the water through the filter-bed will remove all silt and other impurities arrested from the water, and will carry the same away during its escape from the filter. The perforated cone *x* permits the waste water to flow into the return-pipe N, and at the same time effectually prevents the sand or other filtering medium from escaping with the water.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a filter, the base having the passages G, J, and M, in combination with a valve by which the water may be caused to flow either through the passage G or through the passage J and return-passage M, substantially as set forth.

2. In a filter, the valve consisting of the movable plate P, placed between the blocks V D, the plate having ports R S T, the block V, having ports W X, and the block D, having the ports E, F, and L, in combination with the base having passages leading therefrom into the filter, substantially as set forth.

3. In a filter, the escape-passage M and central pipe, N, having a perforated cone on its upper portions, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN W. HYATT.

Witnesses:
CHAS. C. GILL,
J. R. SIDDALL.