(No Model.)

J. W. HYATT.

FILTER.

No. 273,543. Patented Mar. 6, 1883.

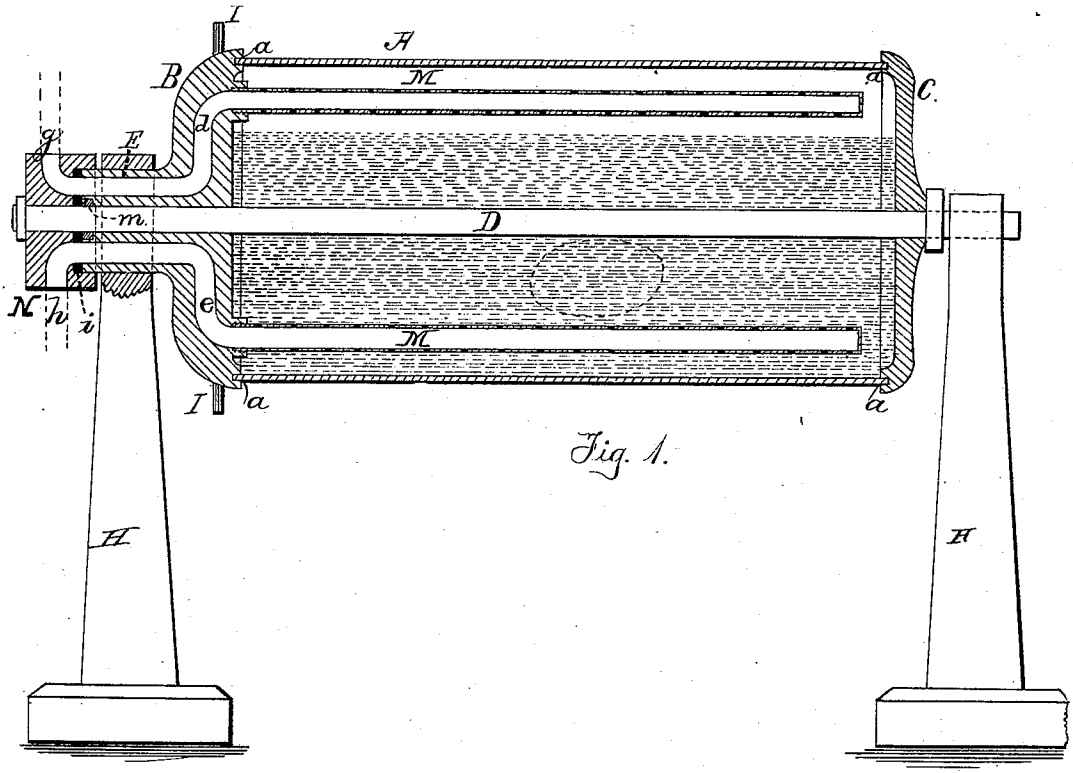

Fig. 1.

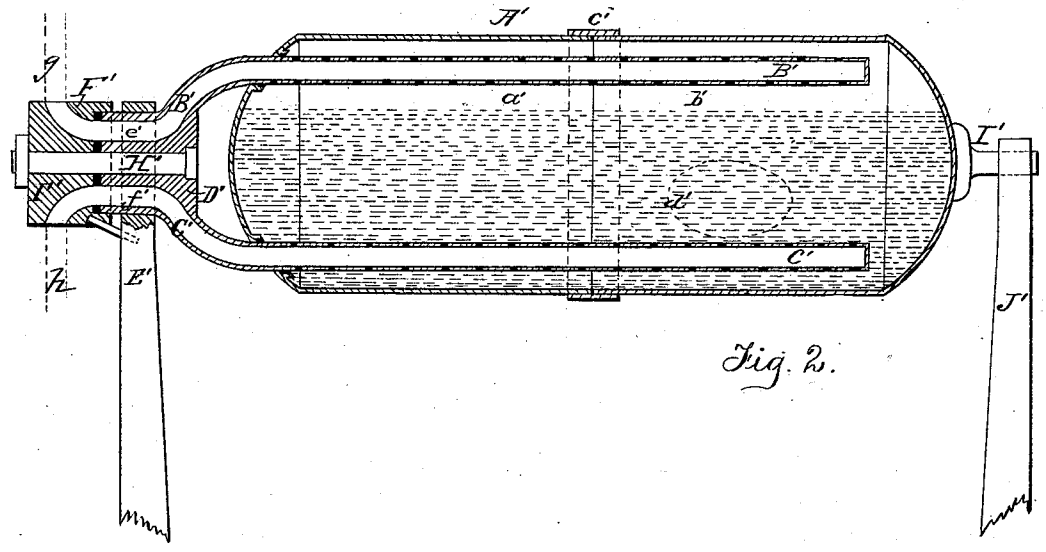

Fig. 2.

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UNITED STATES PATENT OFFICE.

JOHN W. HYATT, OF NEWARK, NEW JERSEY.

FILTER.

SPECIFICATION forming part of Letters Patent No. 273,543, dated March 6, 1883.

Application filed July 19, 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 Improvement 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 improvements in filters; and it consists, first, of a receptacle containing a filtering agent and supplied with interior perforated tubes connected with a supply and delivery, and each adapted for use in connection with either the inlet or outlet; second, of a receptacle only partially filled with the filtering agent and having inlet and outlet ports, and adapted to be turned so that either port may be brought into communication with the supply or the delivery pipes, whereby the current of water may be reversed and the filtering agent agitated by simply changing the position of the apparatus; and, third, in the special construction and arrangement of the filter hereinafter described, which I have selected and illustrate in the accompanying drawings as the preferred embodiment of the invention.

Referring to the drawings, Figure 1 is a central vertical longitudinal section of the invention. Fig. 2 is a similar view of a different embodiment thereof.

A denotes the body of the filter, which is a plain cylindrical vessel, having on its ends the heads B C, which, by preference, will be of cast-iron. The heads B C are supplied on their inner faces, adjacent to their peripheries, with the annular grooves *a*, in which the ends of the cylinder A are placed, and the parts thus secured by the central tie rod or bolt, D, which passes through the apparatus and is supplied with suitable nuts, whereby it may be made effective in locking the cylinder and heads firmly together. The grooves *a* in the heads B C may be provided with some suitable packing for the purpose of insuring water-tight joints, and the outer portions of the heads will be suitably fashioned to facilitate the effectuation of the objects of the invention and to lend to the appearance of the filter. In the present instance the outer portion of the head B is reduced at its center to form the trunnion E, which corresponds in position with the projected end of the tie-rod D, which acts as a trunnion at the opposite end of the apparatus. These trunnions are mounted in bearings formed in the upper ends of the standards H, and permit the rotation of the filter. I have provided the head B with handles I to facilitate the movement of the filter.

Within the cylinder A, and at opposite sides thereof, are arranged the subordinate cylinders or perforated tubes M, which are in direct communication with ports *d e*, and are secured in place by threads on their ends, substantially as shown. The ports *d e* pass through the head B and connect with the inlet and outlet ports *g h*, which are formed in the cap or sleeve N, the upper port, *d*, being in communication with the inlet-port *g* and the lower port, *e*, being connected with the outlet-port *h*. The sleeve N is a metallic piece centrally bored to permit the passage through it of the tie-rod D, and containing the inlet and outlet ports, as stated. The inner face of the sleeve N is provided with a recess or pocket, *i*, which snugly receives the outer end of the head B. A suitable packing of rubber, leather, or other material will be placed in the pocket *i*, between the sleeve and the end of the head, so as to insure a water-tight joint. The tie-rod D is provided with a nut or other locking device at *m*, so that the cylinder A, with the heads B C, may be rotated thereon without interfering with the sleeve N, which sleeve remains stationary upon the rod. The outlet-pipe *h* will be provided with a waste pipe or spout. The cylinder A will be about two-thirds full of filtering material.

In the operation of the device the water enters the inlet *g*, and then passes through the port *d* into the upper perforated tube M, whence it issues in fine streams, passes downward through the filtering material, and enters the lower perforated tube M. Thus the water, cleaned by its passage through the filter-bed, escapes through the ports *e* and *h* and enters the house for use.

It is plain that the filtering agent, after the

water has passed through it, will become foul from the silt and other impurities which it will detract from the water, and it will be necessary to clean and agitate it, so as to render the filter effectual. In order to agitate and clean the bed, I simply turn the cylinder A so that the outlet-port *e* comes into communication with the inlet *g*, and the inlet-port *d* assumes the former position of the outlet-port *e*. This is accomplished by a single semi-rotation of the cylinder A. When I have thus turned the cylinder A it is plain that the body of filtering material will fall to the then lower port of the filter and be agitated and broken, and that the supply of water will pass through the port *e*, where it formerly escaped, and into the tube M, thence downward through the bed of filtering agent, and out through the tube M′ and the port *d*. This is a direct reversal of the current of water, since it now passes through the pipes and bed in an exactly contrary direction to which it did before, and it is plain that the interior of the perforated tubes as well as the bed will be thoroughly cleansed. During the cleaning process the waste-pipe will be opened, so that the dirty water may pass off into a sink or other receptacle. After the bed has become cleaned the waste-pipe will be closed, and the water directed through the house without further alteration of the apparatus. After the bed has become foul again the cylinder A is simply turned to the position again in which it was first described, when the current will pass through the apparatus in a contrary direction, cleaning the same.

It will be observed that the filter-bed is thoroughly broken and agitated and the passage of the water through the pipes reversed by simply giving the cylinder a semi-rotation. This is a very important part of my invention, and is of great utility. The fact that the receptacle A is only about two-thirds full of filtering material permits it to fall when the cylinder is turned, and of course facilitates the agitation and cleaning process. If the cylinder A were packed full of filtering material, the agitation thereof would be difficult and the cleaning require more time and be less satisfactory.

Another construction embodying my invention is illustrated in Fig. 2. The filter shown in this figure is one of great simplicity, besides being durable and inexpensive. Referring to this embodiment of my invention, A′ indicates the cylinder or main receptacle, and it is made of two sections, *a′ b′*, of sheet-copper, struck up and united by the band *c′*, forming a complete body. The sections *a′ b′* are struck up according to the usual method of making boilers for houses. Within the cylinder A′ is placed the usual bed of filtering material, and a hand-hole, *d′*, is provided to facilitate the introduction and withdrawal of the filtering agent, when desired. The inlet and escape pipes B′ C′ are cast in one piece with the contracted portion D′, wherein are formed the inlet and outlet ports *e′ f′*, leading to the said pipes B′ C′. The contracted portion D′ is journaled in the upper end of the standard E′, while the pipes B′ C′ pass into the cylinder A′ through apertures formed in the end thereof, as shown in Fig. 2. Upon the end of the contracted portion D′ is placed the cap T′, which is similar in all respects to the cap N described in connection with the first embodiment of my invention. The cap T′ is held in place by a bolt, H′, which passes through it and the contracted portion D′, and is held in place by nuts on the ends thereof. The cap F′ is provided with supply and delivery ports, and may be prevented from turning by a pin or other device connecting it with the standard E′. The pipes B′ C′ within the cylinder A′ are provided with apertures to permit the escape of the water; and the contracted portion D′ may be supplied with handles to facilitate the turning of the apparatus. Upon the end of the cylinder A′ opposite to the contracted portion D′ is provided a lug, I′, which will be mounted in journals in the upper end of the standard J′.

The operation of the filter which I have just described is the same as that set forth in the first part of my specification, and need not be repeated here.

In withdrawing the filter-bed from the cylinder A′ some suitable receptacle is placed beneath the cylinder and the hand-hole opened. The water will then issue with the sand or other filtering agent and fall into the receptacle.

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

1. A rotating filter containing a bed of filtering material, and supplied with inlet and outlet ports *d e* and fixed supply and delivery ports *g h*, whereby when the filter is turned either the port *d* or *e* may be brought into communication with either the port *g* or *h*, substantially as set forth.

2. A rotating filter consisting of a receptacle mounted in bearings and containing a bed of filtering agent, and supplied with inlet and outlet ports protected by perforated metal, in combination with fixed supply and delivery ports, the inlet and outlet being arranged to be brought into communication with either the supply or the delivery port when the filter is turned, substantially as and for the purpose set forth.

3. A rotating filter consisting of a receptacle partially filled with a filtering material loosely placed within the same, and having inlet and outlet ports protected by perforated metal, in combination with the supply and delivery ports, the inlet and outlet being arranged to come into communication with either the supply or delivery as the filter is turned, whereby the current is reversed through the apparatus without interfering with the supply, substantially as specified.

4. A filter consisting of the receptacle mounted on trunnions and containing a bed of filtering material, the perforated tubes M M′, the inlet and outlet ports connecting with the sup-

ply and delivery, the cylinder A being adapted to be turned so that either inlet or outlet port may be brought into communication with the supply or delivery, the supply and delivery remaining unchanged, substantially as set forth.

5. The cylinder A, mounted on trunnions and supplied with the perforated tubes M M′ and the ports *d e*, in combination with the cap N, containing the supply and delivery ports, the cylinder being adapted to be turned so that either the inlet or outlet ports may be brought into communication with the supply or the delivery, substantially as set forth.

6. The cylinder A, supplied with the heads B C and tie-bolt D, in combination with the perforated tubes M M′, the ports *d e*, and cap N, having a supply and delivery, the cap being fixed and the cylinder adapted to be rotated, substantially as set forth.

7. A reversible filter having inlet and outlet ports adapted to be used either for the supply or delivery, respectively, and containing a loosely-placed bed of filtering material, which only partially fills the receptacle, whereby when the position of the filter is reversed the bed will change position and be thus broken apart and agitated, the silt and other impurities being carried away by the current of water, substantially as set forth.

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

JOHN W. HYATT.

Witnesses:
CHAS. C. GILL,
HERMAN GUSTOW.