

J. W. HYATT.
FILTER.

No. 355,694.

Patented Jan. 11, 1887.

Fig. 1.

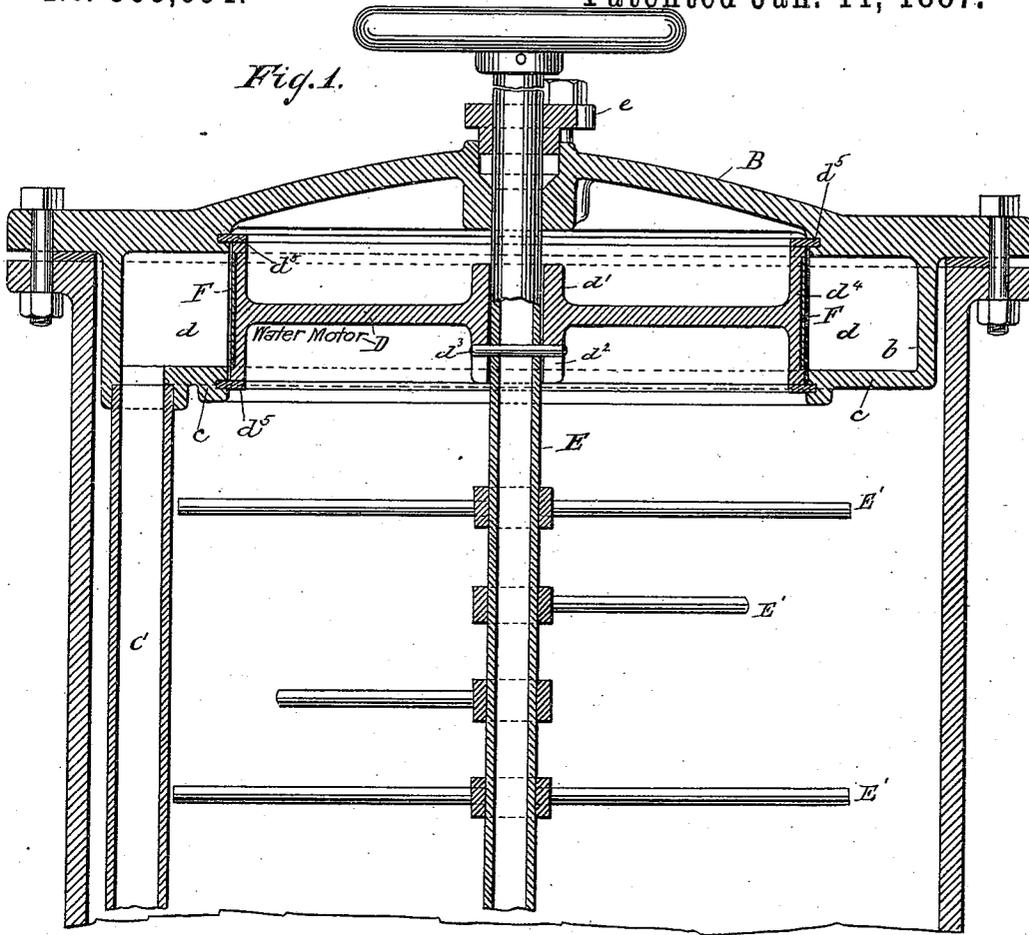
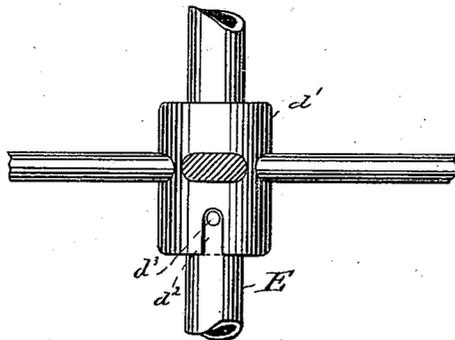


Fig. 3.



WITNESSES:

Edward Wolff.
Herman Custow.

INVENTOR

John W. Hyatt

(No Model.)

2 Sheets—Sheet 2.

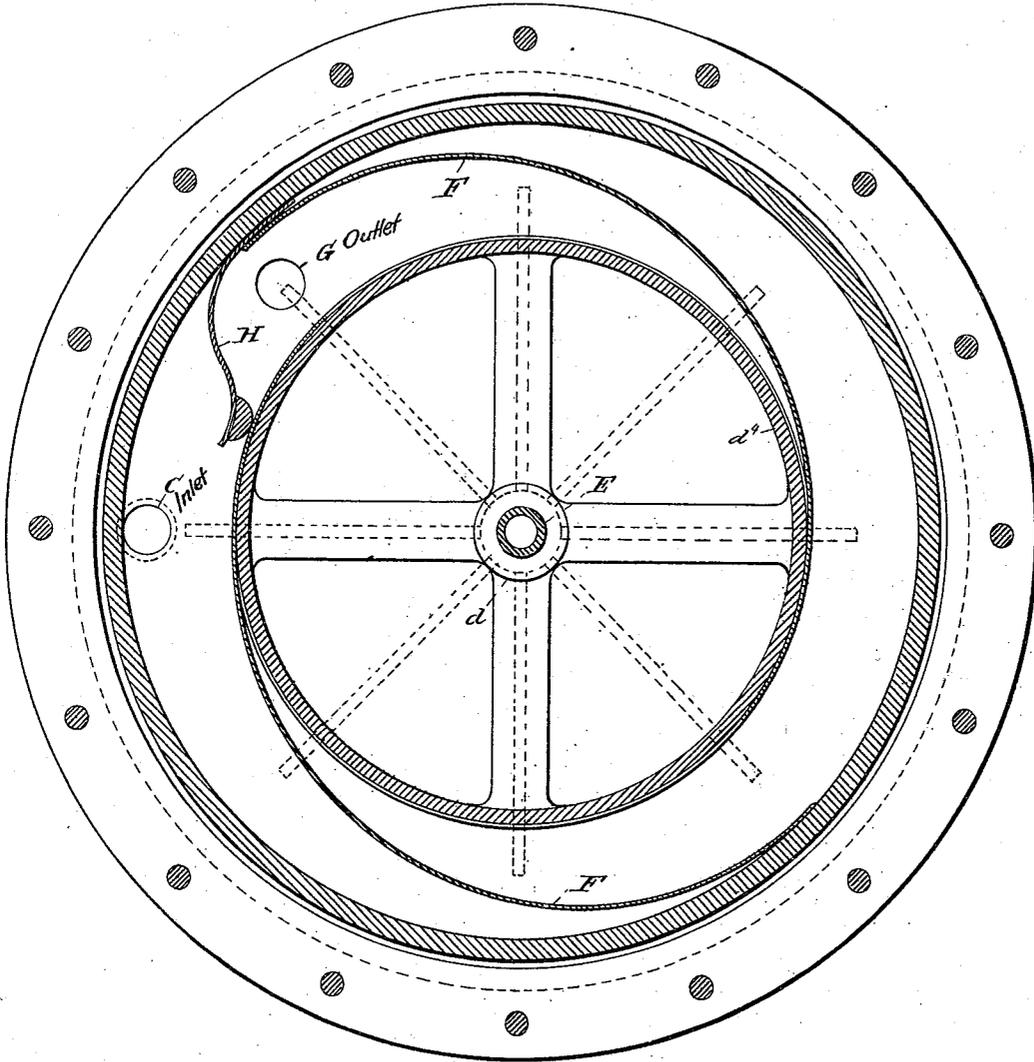
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Fig. 2.



WITNESSES:

Edmund Wolff.
Herman Gustow.

INVENTOR

John W. Hyatt

UNITED STATES PATENT OFFICE.

JOHN W. HYATT, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE NEWARK
FILTERING COMPANY, OF SAME PLACE.

FILTER.

SPECIFICATION forming part of Letters Patent No. 355,694, dated January 11, 1887.

Application filed July 17, 1885. Renewed April 12, 1886. Serial No. 198,652. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. HYATT, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Filters, of which the following is a specification.

My invention relates to an improvement in filters, the object being to provide devices whereby the water, after being used to cleanse the filter-bed and during its passage from the filter into the outlet-pipe, shall be employed to actuate a central rod provided with laterally-extending arms, and thereby keep the sand or other filtering material during the cleansing process in a constant state of agitation.

With this end in view my invention consists in certain novel features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 represents in vertical section the upper portion of a filter embodying my improvement. Fig. 2 is a top plan view thereof, and Fig. 3 is a detached view showing the manner of securing the wheel to the rod or axle.

A represents the sides of a filter, to the upper portion of which is removably secured the cover B, a suitable packing, *a*, being inserted between them to form a water-tight joint. The cover B is cast with the downwardly and inwardly extending sides *b* *c*, respectively, which, together with the rim of the wheel D, hereinafter described, form a chamber, *d*. Into the side or bottom *e* of this chamber fits the upper end of the pipe C, which extends downwardly through the filter, and is connected at its lower end with the pipe which supplies the water to the filter, the said pipe C being designed to convey the water to said chamber during filtering process and to serve as an outlet-pipe during the cleansing process.

E represents a brass pipe extending upwardly through the cover B, and having its lower end journaled in a suitable bearing secured to the bottom of the filter, said pipe being encircled by the gland *e*, and having secured thereto laterally-extending arms *E'*. To the pipe E is secured the wheel D, the hub *d'* thereof being formed with a horizontal slot, *d''*,

in which is adapted to fit the horizontal pin or bar *d''*, the latter passing through the pipe E, the rim *d'* of said wheel D forming, as before described, the inner wall of the chamber *d*. On the upper and lower edges of the rim *d'* bear the leather packing rings *d'*, which are forced into grooves cut in the cover B and lower wall, *c*, of the chamber *d*, said rings being employed for the purpose of forming the chamber water-tight. It will be readily seen from this construction and arrangement of parts that by removing the cover B the wheel D is also removed therewith and easy and ready access had to the interior of the filter.

To the rim of the wheel D is secured one end of the vanes F, the free ends thereof bearing against the inner side of the wall *b*, as shown in Fig. 2 of the drawings. During the operation of cleansing the water flows up through the filter-bed and enters the chamber *d* through an opening, G, formed in the lower wall, *c*, thereof, and bearing against the vanes F forces them around until the water escapes through the pipe C. At this period of the operation the water enters the opening G behind the secured vane and forces it around, thereby exerting a continuous force on the vanes, which, by having their ends secured to the wheel D, as before described, will, through the intervention of the latter, continuously revolve the pipe E and the arms *E'*, secured thereto, thereby keeping the filtering material in a constant state of agitation.

To prevent the water from escaping directly from the opening G through the pipe C, I secure to the inner side of the wall *b* one end of the wide spring H, the free end of which bears against the periphery of the wheel D and effectually checks the backward flow of water. This spring also operates as a relief-valve, in that if the pressure of the water becomes excessive the free end of said spring will be forced outwardly and allow the water to escape directly into the pipe C.

During the filtering process the water will enter the chamber *d* through the pipe C, and, passing behind the vanes F, will circulate down through the opening G and into the filter without disturbing the wheel or agitating-arms.

This device is automatic in its operations, is effective in use, thoroughly agitating the fil-

tering material by means of power derived from the water which has been previously used for cleansing the bed, and, further, can be applied to filters at a small cost.

5 It will be understood from the above description that the rotation of the water-wheel and agitating-arms is effected automatically when the current through the filter-bed is reversed to cleanse the same, and that the wheel
10 and arms become automatically inoperative when the current is restored to its normal direction for filtering the fluid. Such automatic operation results from the arrangement of the water-passages relative to the water-
15 wheel and the filter-bed, whereby the fluid produces no effect upon the wheel when moving in one direction, but actuates the same continuously after its passage through the bed, when reversed to cleanse the same. My invention
20 is thus readily distinguished from such constructions as do not require the agitation of the filter-bed or the reversal of the current to cleanse the same, and I wholly disclaim any mechanism which operates during the filtering
25 operation, or which does not lie within a bed of loose material to stir the same and disengage the impurities therefrom.

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

30 1. The combination, with a filter having a bed of loose filtering material, and having an inlet and outlet and means for reversing the current of the water through the same when
35 cleansing the bed, of a stirring-shaft having stirring-arms located within the substance of the filter-bed and a water-wheel secured to the said shaft within the filter, the whole being arranged and operated to rotate the stirring-
40 shaft when the current is reversed to loosen and cleanse the filter-bed.

2. In a filter, a motor for agitating the filter-

bed during the cleansing thereof, which consists of a water-wheel, agitating-arms connected therewith and located within the filter-bed, a
45 chamber having an inlet and outlet formed around the wheel, vanes secured to the wheel and fitting against the outer wall of the chamber, and a movable partition located within the chamber between said inlet and outlet, substantially as set forth. 50

3. In a filter, a motor for agitating the filtering-bed during the cleansing process, which consists of a wheel, D, agitators connected therewith and located within the filter-bed, a
55 chamber, d, formed around the wheel and provided with the opening G, the pipe leading into the chamber, vanes secured to the wheel and fitting within the chamber, and a partition extending across the chamber between the opening G and said pipe, substantially as set
60 forth.

4. A motor for agitating a filter-bed during the cleansing thereof, which consists of the wheel D, cover B, formed with the chamber d,
65 vanes F, spring H, shaft E, and arms E', the above parts being adapted to operate substantially as set forth.

5. The combination, with a filter-casing, of a filter-bed located therein, an agitator for stirring the said bed while cleansing, and a motor
70 arranged to drive the said agitator and connected with the waste-pipe of the filter and operated by the waste-water used in washing the filter, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 15th day of
75 July, A. D. 1885.

JOHN W. HYATT.

Witnesses:

HERMAN GUSTOW,
ARTHUR L. HENTHORN.