

J. W. HYATT.

FILTER.

No. 273,540.

Patented Mar. 6, 1883.

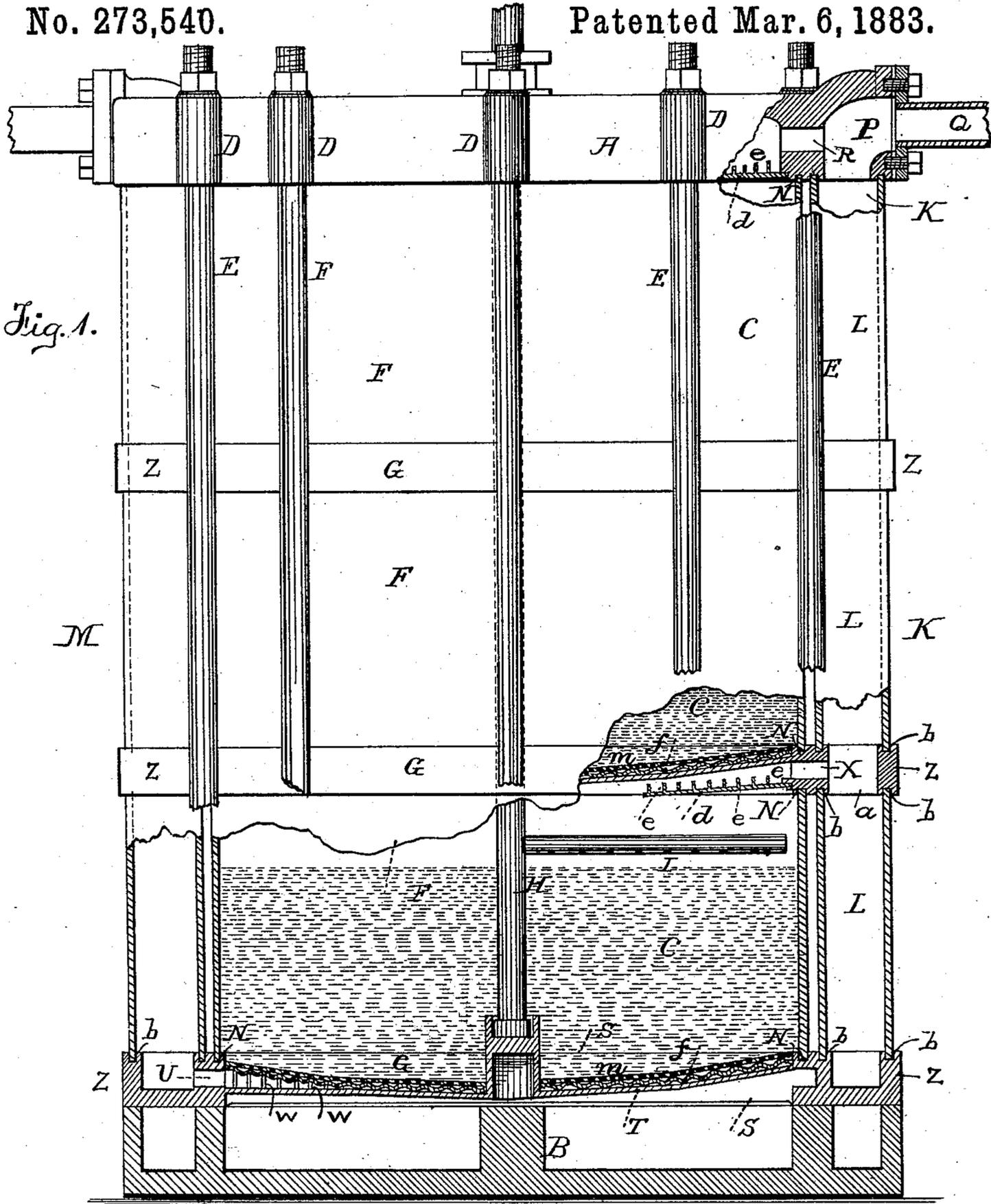
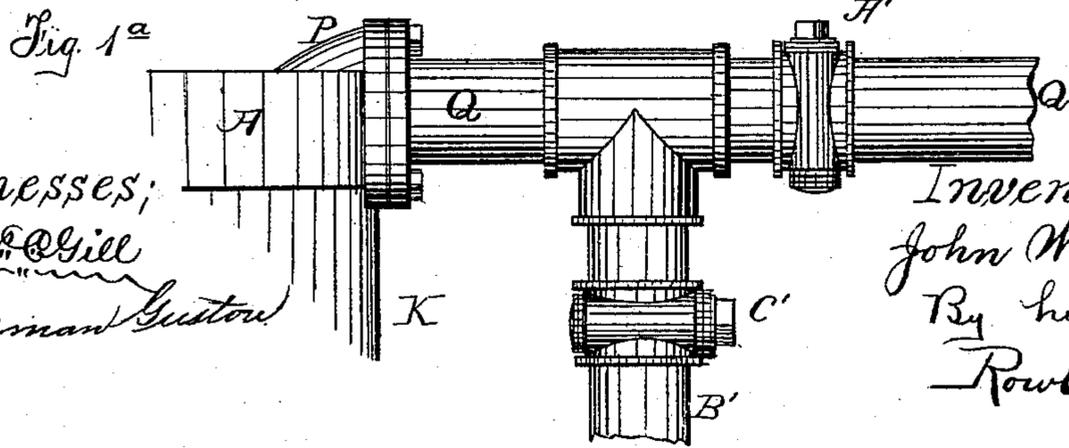


Fig. 1.



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Fig. 2

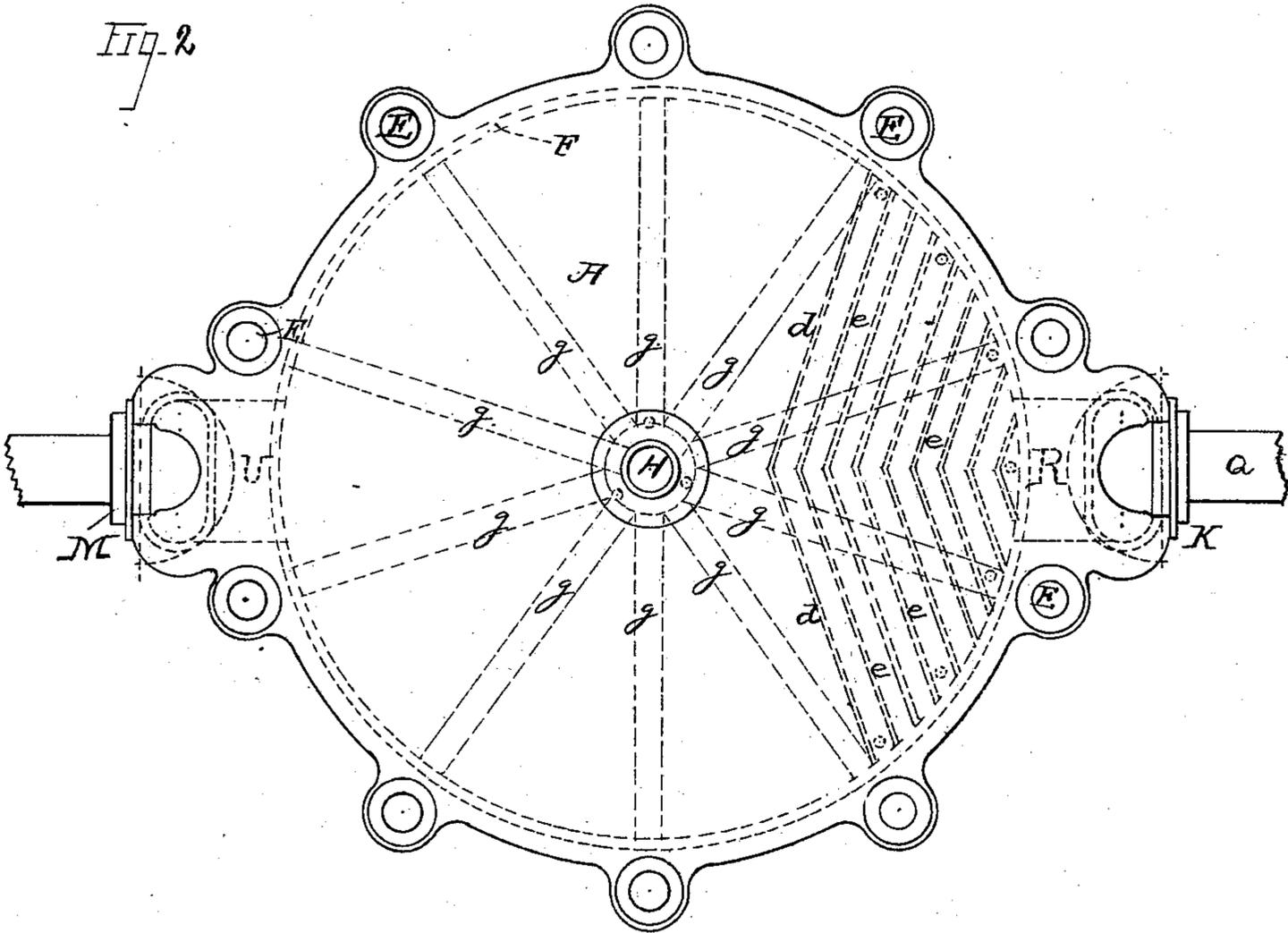
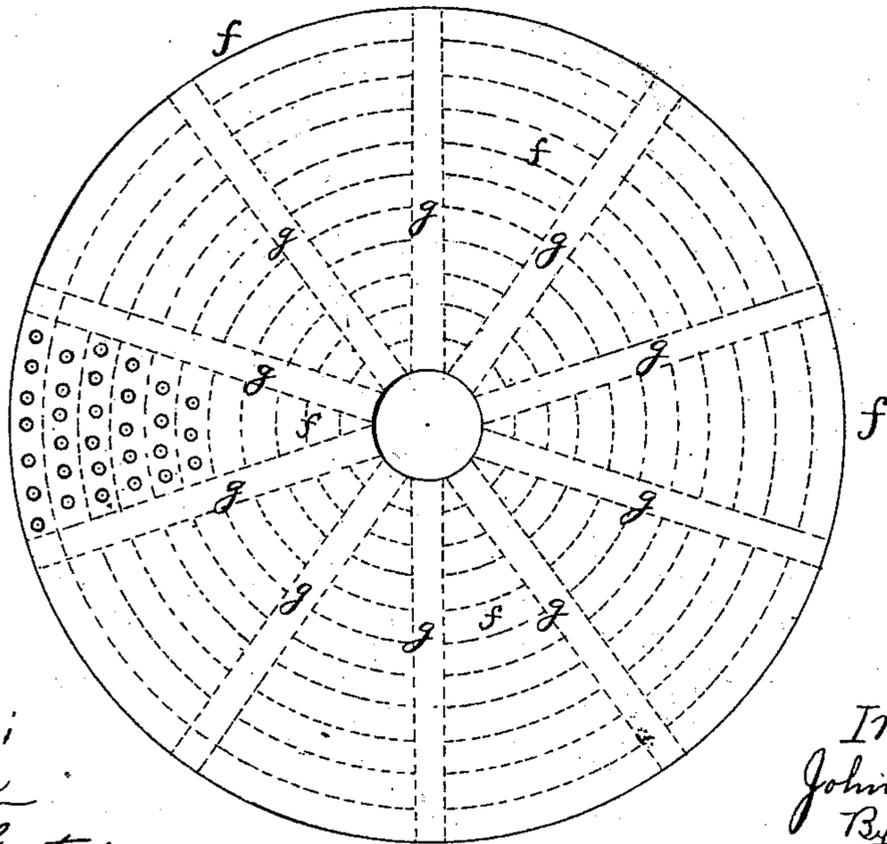


Fig. 3



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UNITED STATES PATENT OFFICE.

JOHN W. HYATT, OF NEWARK, NEW JERSEY.

FILTER.

SPECIFICATION forming part of Letters Patent No. 273,540, dated March 6, 1883.

Application filed March 31, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. HYATT, of Newark, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Filters, of which the following is a specification, reference being had to the accompanying drawings.

The nature of the invention will appear from the following detailed description, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of an apparatus embodying the elements of the invention. Fig. 1^a is a detached view of the supply-pipe and of the waste-pipe, the latter to be brought into use during the operation of cleansing the filter-beds; and Fig. 2 is a top view of the same. Fig. 3 is a view of the corrugated plate *f*, presented to show the position of the outlet-perforations, the corrugations being shown in dotted lines.

The apparatus is of cylindrical form; and it consists of a series of independent chambers or sections containing beds of filtering material.

A denotes the head of the apparatus, B the base, and C the sections or independent chambers. The head and base will be formed of cast-iron, and provided at proper intervals on their edges with lugs D, adapted to receive the connecting bolts or rods E, whereby the wrought-iron bands F and cast-iron diaphragms G, forming the chambers C, are held in place.

The apparatus is provided with a central washer-pipe, H, having perforated arms I, which extend over the filter-beds in each chamber C.

Upon one side of the apparatus, and connected with each chamber C, is an inlet-pipe, K, made in sections L, and upon the opposite side of the apparatus, also in sections and connected with each chamber C, is an outlet or delivery pipe, M.

The bands F are cylindrical pieces of wrought-iron, the edges of which, when the apparatus is built up, fit in grooves or seats N, formed in the cast-iron diaphragms G and in the head A and base B.

The head A is cast or otherwise provided with a port, P, adapted to be connected with a

supply-pipe, Q, and is also provided with the port R, leading from the port P to the uppermost chamber C. The port P is connected with the sections of pipe which form the inlet-pipe K.

The cast-iron diaphragms G are similar in outline to the head A shown in Fig. 2, though slightly smaller, and each consists of the rim S and floor T. The rims S are of sufficient diameter to snugly receive the edges of the wrought-iron bands F, as indicated in the drawings. The floors T will preferably have a smooth surface, except at those parts adjacent to the outlet-ports U, where the series of lugs W are provided, the parts U being cast in the rims S and leading to the outlet-pipe M. The lugs W are tallest at the ports U, and gradually diminish in height as they approach nearer the center of the floor T.

In all of the diaphragms G are provided at one side the inlet-ports X, (which correspond exactly with the inlet-port R, formed in the head A,) the outlet-ports U being provided at the opposite side. The inlet-ports X lead into each chamber C in close relation to the under surface of the floor of each diaphragm G, and the ports U are connected with the outlet-pipe at points on a level with the upper surface of the floor of each diaphragm.

The diaphragms G are cast with projections Z on opposite sides, containing apertures *a*, and with the grooves *b*, which encircle the apertures *a*, and are adapted to receive the edges of the sections composing the inlet-pipe K and outlet-pipe M. The apertures *a* form a communication between the sections of the inlet and outlet pipes, whereby a complete discharge and delivery service is provided.

Immediately below each inlet-port X and the upper inlet-port, R, are secured, by bolts, rivets, or otherwise, the rippling-plates *d*. (Illustrated in section in Fig. 1, and the general form and character of which are indicated by dotted lines in Fig. 2.) The rippling-plates consist of plain pieces of metal inclining slightly downward and away from the inlet-ports, and having numerous pins or ribs, *e*, upon their upper surfaces, which pins or ribs may be cast with the plates, and will preferably extend in lines parallel with their interior edges, as shown in Fig. 2.

Upon the floor of each diaphragm is secured the corrugated sheet of metal *f*, which is of sufficient size to completely cover the floor, and is secured at its edges so as to form a water-tight joint. At the center of the plate is cut an aperture, through which the sleeve surrounding the washer-pipe *H* passes. The corrugations in the plate *f* will preferably be in circles concentric with the filter-bed, and will be traversed by any suitable number of grooves or corrugations, *g*, radiating from the center to the circumferential edge of the plates, as indicated by dotted lines in Figs. 2 and 3. The parts of the plates which are over and rest upon the lugs *W* adjacent to the outlet-ports are perforated, as shown, so as to permit the escape of the water to the ports when the apparatus is in use. Upon the corrugated plates *f* are placed the sheets of perforated metal *m*, upon which are the beds of sand or other filtering agent in granular form.

The supply-pipe leading into the inlet *K* and the delivery forming an outlet from the machine being opened, the water will enter the chambers *C* through the ports *R* and *X*, passing over the rippling-plates *d*, and percolate downward through the filter-beds, being thereby purified, after which it passes through the sheets *m* and follows the corrugations in the plates *f* until it comes in contact with the parts resting upon the lugs *W*, when it escapes through the perforations, and, passing out of the ports *U*, is conducted off by the delivery-pipe.

When the filter-beds are being washed by reversing the current of water through the apparatus and the employment of the washer-pipe *H* and auxiliary arms, the sand or other agent of which the beds may be composed will be greatly agitated, and if the rippling-plates *d* were not supplied a portion of it would be liable to escape through the ports *X* with the silt and unclean water. As suggested, however, the plates *d* prevent this result, the pins or ribs *e* catching the sand and retaining it until the operation of filtering is resumed, when it will be washed off upon the sand beds again.

The rippling-plates *d* have been found to be of greater utility than the "extensions *X*" shown in Patent No. 248,468, granted to me October 18, 1881, since they not only prevent the influx of water from discharging the sand beds, but permit a free escape of the silt and dirt agitated during the operation of washing the beds.

In the operation of washing and agitating the filter-beds the current is reversed through the apparatus, as aforesaid, and water permitted to pass through the central washer-pipe, *H*, and the auxiliary arms *I*. During this operation the valve *A'* is closed and the valve *C'* is opened, whereby the water, passing from the delivery *M* through the ports

U, the filter-beds, and ports *X* into the supply-pipe *K*, will have an outlet through the pipe *B'* away from the filter. After the reversed current of water has been passing through the filter for a few minutes, and the impure water allowed to escape through the pipe *B'*, the valve *C'* is closed and the valve *A'* is opened, and the operation of filtering the water proceeded with as before, the supply to the central washer-pipe, *H*, being also shut off.

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

1. A filter consisting of a series of independent chambers containing inlet and outlet ports and provided with beds of filtering material, the chambers being formed by independent wrought-iron bands separated by cast-iron diaphragms, the whole being held in position by tie-bolts, substantially as set forth.

2. In a filter, the chambers *C*, containing a bed of sand or other filtering agent, and supplied with an inlet and an outlet port, the inlet-port being supplemented by a rippling-plate, *d*, having ribs *e* extending over a portion of the filter-bed, substantially as set forth.

3. In a filter, the chamber *C*, having inlet and outlet ports, and having a floor consisting of the diaphragm *T*, the corrugated plate *f*, and the perforated plate *m*, supporting the filtering agent, the corrugated plate being perforated to permit the escape of the water, substantially as set forth.

4. In a filter, the chamber *C*, having upon its floor the corrugated plate *f*, that portion of which adjacent to the outlet-port being perforated, the chamber also containing a bed of sand or other suitable filtering agent, separated from the corrugated plate *f* by a sheet of perforated metal, and an outlet-port supplemented below by the ribbed plate *d*, substantially as and for the purposes set forth.

5. The filter herein described, consisting of a series of chambers formed by the wrought-iron cylinders and cast-iron diaphragms, the whole connected by tie-bolts and supplied with the inlet and outlet pipes, also formed of sections which are held between the cast-iron diaphragms, the said diaphragms being grooved to receive the edges of the wrought-iron cylinders and the sections forming the inlet and outlet pipes, the chambers being provided with suitable inlet and outlet ports and containing a bed of sand or other suitable filtering agent, substantially as set forth.

In testimony that I claim the foregoing improvement in filters, as above described, I have hereunto set my hand this 8th day of March, 1882.

JOHN W. HYATT.

Witnesses:

CHAS. C. GILL,
HERMAN GUSTOW.