H. W. WATSON.

SELF-CLEANING FILTER.

No. 192,313. Patented June 19, 1877.

Fig. 1

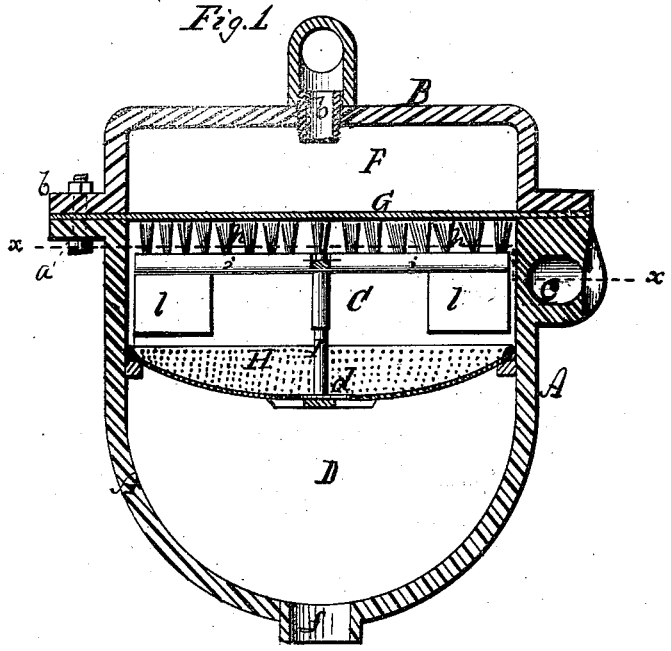


Fig. 2.

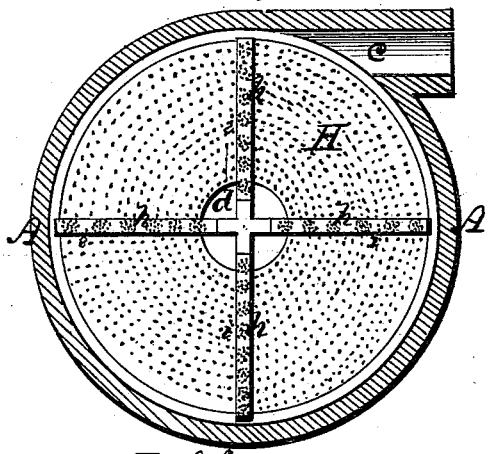
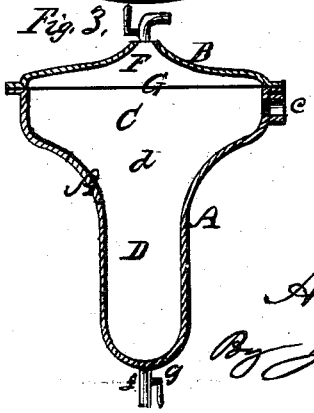


Fig. 3.



WITNESSES

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HENRY W. WATSON, OF NEW YORK, N. Y.

IMPROVEMENT IN SELF-CLEANING FILTERS.

Specification forming part of Letters Patent No. **192,313**, dated June 19, 1877; application filed February 16, 1877.

To all whom it may concern:

Be it known that I, HENRY W. WATSON, of the city, county, and State of New York, have invented an Improved Self-Cleaning Filter; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification—

Figure 1 being a central vertical section of the improved filter; Fig. 2, a horizontal section thereof, in a plane indicated by the line *x x*, Fig. 1; Fig. 3, a section showing a modification of the construction of the filter.

Like letters designate corresponding parts in all of the figures.

The nature of my invention consists in a filter, which has the elements of a water-inlet so arranged as to cause the water, by the motion of flowing into the filter, to flow laterally under and wash the lower surface of the filtering material; a mud or sediment receptacle below the water-inlet to receive the impurities deposited from the water; a partial partition or diaphragm between the water-inlet chamber and the sediment-receptacle, to prevent the motion of the inflowing water from disturbing the water in the said receptacle, either to stir up the sediment deposit, or to interfere with the deposit thereof; and in cases of large-sized filters, and wherein the water is unusually impure, a brush or set of brushes, acting upon the lower surface of the filtering material, and moved by the inflowing water, all substantially as hereinafter specified.

In the drawings, A represents the case or body of the filter, made of strong cast-iron, or otherwise, of sufficient strength to resist any pressure of water with which it is supplied; and B, a cover for the body A, also constructed with sufficient strength, and arranged to be connected removably with the body by bolts passed through flanges *a b* on the two parts, respectively, as shown, or otherwise. The body A is conveniently constructed to contain the inlet-chamber C, and the sediment-receptacle D; and the cover B to contain the pure-water outlet-chamber F. The filtering diaphragm G, of any suitable material, and desired thickness, extends across the interior of the filter between the inlet-chamber and outlet-chamber, the direction of the water in filtering being upward; and in case the material is a fibrous diaphragm, which I prefer for ordinary pipe-filters, it is convenient to hold it in place by clamping its edges between the body A and cover B. The water-inlet *e*, where the service or other pipe or water connection is attached, is located just below the filter diaphragm, and its position is oblique or as nearly tangential as practicable to the interior surface of the filter, as shown in Fig. 2, so that the water flowing in through the same will acquire a rotary motion in the chamber, and thereby, among other advantages, sweep the whole under surface of the filter; and, if the motion of the water is considerable, it will effectually keep the filtering surface free from impurities. This circular motion of the inflowing water also keeps the inner surface of the inlet-chamber C free from deposited impurities, and causes the impurities floating in the water to tend to the center of the filter, where the deposit proceeds freely.

To give greater efficiency to the depositing action, and to prevent the motion of the water in the inlet-chamber from disturbing the water in the depositing-chamber, I locate a partial diaphragm, H, between the two chambers, closing the space next to the periphery of the filter, where the motion of the water is principally produced, and being open at *d* in the middle, where the motion of the water is very slight. Through this opening *d* the main deposit takes place, especially large impurities, which sometimes enter the filter through the water-pipe, no impediment being offered to their descent into the sediment-receptacle. The diaphragm may be solid, but I have represented, and prefer it perforated, to give freer passage to the impurities downward, yet still to cut the motion from the receptacle below. Even a wire gauze may serve for the diaphragm, and ordinarily the central aperture might be dispensed with, though I prefer to use it.

In Fig. 3 is shown a modification of the construction whereby the diaphragm is dispensed with, the inlet-chamber being of larger diameter than the sediment-receptacle below, so that the annular bottom of the inlet-chamber, outside of the receptacle, serves for the diaphragm, and the upper opening of the recepta-

cle serves instead of the opening in the middle of the diaphragm. The sediment-receptacle terminates at the bottom in a narrow pocket, and a discharge-passage, *f*, opens therefrom, closed by a valve, *g*, Fig. 3, for discharging the accumulated impurities at proper intervals.

The outlet of the filtered water, to which the faucet or drawing-off pipe is attached, may be centrally at the top, as shown, or at one side of the cover.

The elements above described constitute the more essential features of my improved filter; but for the larger filters, and for use where the water is quite impure, I provide for a still more effective means of keeping the under surface of the filtering diaphragm clear from impurities, and thus give free passage to the water. I locate a set of freely-revolving brushes, *h h h h*, just below the said diaphragm, so that they may revolve in contact with or close to the same. They are attached to radial arms *i i i i*, which are wide vertically, or have vanes *l l l l*, arranged to be struck by the water as it flows into the chamber C; and since the inlet-passage *c* is oblique, the motion of the water causes these brushes to continually revolve as long as the flow continues; and when the water is not in motion, the deposit being downward, no impurities then adhere to the filtering diaphragm. The brushes are or may be mounted by a central bearing on a central pivot, I, supported conveniently by the partition H, as shown, or it may be sustained by a rod suspended from the cover B of the filter, and extending down through the filtering diaphragm. The mode of mounting the brushes is not essential.

In the top or cover B, over the filtering diaphragm G and above the bottom of the outlet-pipe *b*, is a space which contains air, that serves as an elastic cushion, to prevent shock and sometimes the consequent bursting of the filter by the sudden stopping of the flow of water into the filter.

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

1. In a filter, the combination of an inlet-chamber, C, having an oblique or nearly tangential water-inlet, *c*, with a sediment-receptacle, D, substantially as and for the purpose herein specified.

2. In a filter, a partition or diaphragm, H, constructed and operating substantially as described, situated between an inlet-chamber, C, having an oblique inlet, *c*, and a sediment-receptacle, D, substantially as and for the purpose herein specified.

3. In a filter, a revolving brush or brushes, *h h h h*, operated by the inflowing water, in combination with an upwardly-filtering diaphragm, G, substantially as and for the purpose herein specified.

4. In a filter, a water or fluid inlet, *c*, arranged to introduce the fluid in a laterally-oblique direction, so as to impart a rotary motion to the inflowing fluid in the filter, in combination with a filtering diaphragm or surface, E, arranged to receive the sweeping and cleansing action of the rotating fluid, substantially as and for the purpose herein specified.

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Witnesses:
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