(No Model.)

J. T. WALLS.

FILTER.

No. 342,151. Patented May 18, 1886.

Fig. 1.

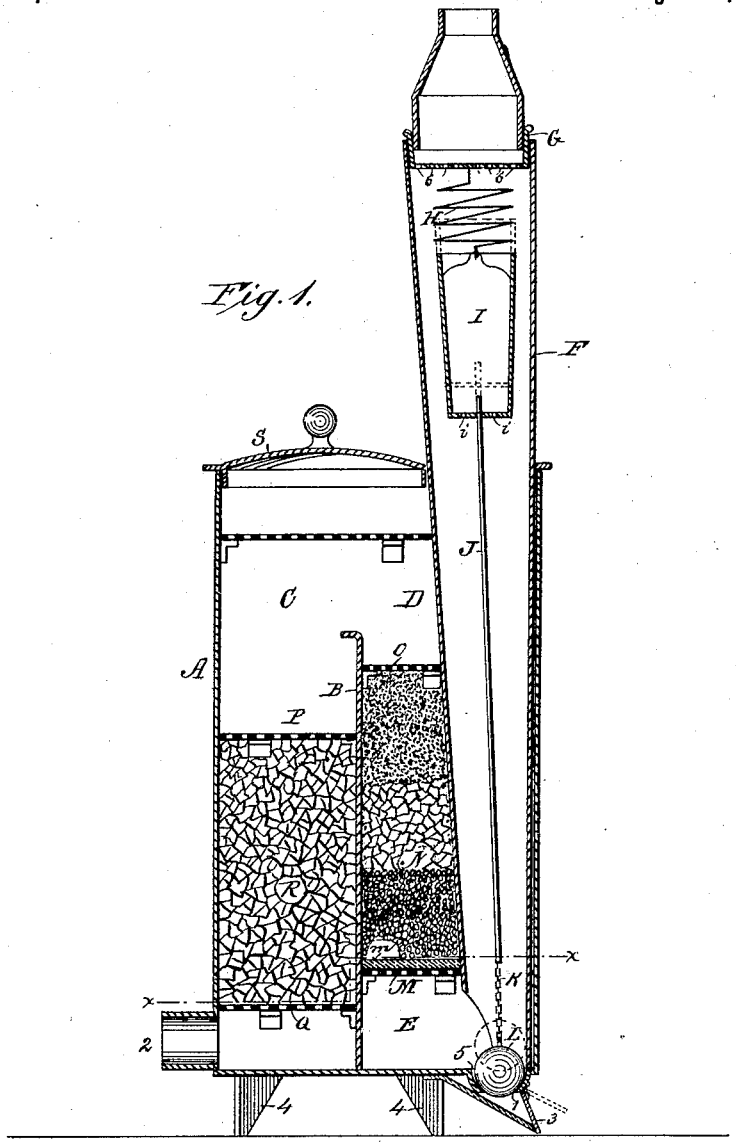
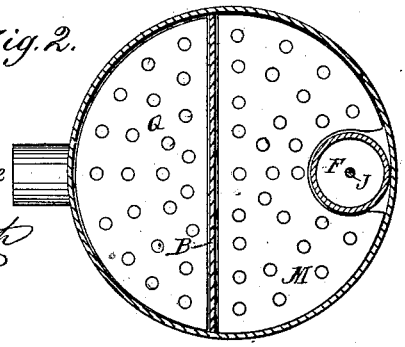


Fig. 2.



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JAMES T. WALLS, OF BUTLER, MISSOURI.

FILTER.

SPECIFICATION forming part of Letters Patent No. 342,151, dated May 18, 1886.

Application filed February 4, 1886. Serial No. 190,877. (No model.)

To all whom it may concern:

Be it known that I, JAMES T. WALLS, of Butler, in the county of Bates and State of Missouri, have invented a new and useful Improvement in Filters, of which the following is a description.

My invention is an improvement in that class of filters intended for use in connection with a hydrant or elsewhere where the water to be filtered is furnished in a stream, and is cleansed in its passage through the apparatus, and wherein the first portion of water received from said source of supply passes directly out of the receiving-chamber of the filter, and cleanses the same, while the water following is directed through the filtering or purifying chambers.

The invention consists in the novel construction and combination of parts hereinafter described, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal section of my filter. Fig. 2 is a cross-section thereof drawn through the filtering-chambers, and looking toward the end plates thereof.

The main casing A is formed, preferably, cylindrical in cross-section, and is divided longitudinally from its bottom nearly to its top by a partition, B, which divides it into two approximately similar sections, C and D. These sections are provided near their lower ends with outlets 1 and 2, the former being the outlet-pipe from the receiving-chamber E. This pipe leads downward from the chamber E, and its outer end is closed by a valve or trap-door, 3, hinged in such manner as to permit water to flow freely out of pipe 1, and to prevent the ingress of insects, mice, and the like, which otherwise might crawl into the chamber E and die, thus fouling the said chamber. The case A, it will be seen, is supported on legs 4, so that its bottom may be held clear of a supporting-base and a vessel to receive the purified water from outlet 2, which is the discharge from section C, and leads from the side thereof close to its lower end. The infeed pipe or tube F leads vertically into section D from the top of and extends close to the bottom of said section, where it opens into the chamber E directly above the outlet-pipe 1. The inner end or mouth of this opening 1 is dished or formed concave at 5, providing a concave seat for the ball-valve, presently described. Usually the tube F extends above the case A, and is provided at its upper end with a detachable cap adapted to form a connection with a hydrant or other supply-pipe. Within the upper end of the tube I fit removably the separating-pan G, which has a perforated bottom, 6, adapted to stop any large substances likely to clog the apparatus. This pan may be held from dropping through the tube F by tapering the latter gradually inward toward its lower end, as shown. From this pan G, I suspend by spring H the bucket I, to which is connected the rod J. To the lower end of rod J, I connect by chain K or other flexible connection the valve L, the same being a ball (usually of rubber) fitted to valve-seat 5, and closing the outlet 1 when said valve L is lowered. Spring H is formed with sufficient strength to hold the weight of bucket I, rod J, and valve L, so as to secure said valve clear of its seat when bucket I is empty; but when bucket I fills with water the increased weight expands the spring, lowering the bucket and valve, so that the latter will close the outlet 1. The valve-seat of this outlet being concaved, as shown, the ball will accurately adjust thereto and close the outlet. Thus in operation it will be seen the first water received flows into the chamber E and directly out thereof without passing through the filtering-chambers, presently described, while the water received after bucket I is filled passes through such chambers and is purified. Bucket I has a small discharge-opening, *i*, by which it may slowly empty when the supply of water ceases.

Above chamber E is arranged a perforated plate, M, forming the bottom of chamber N, the top of which is formed by a plate, O.

Perforated plates P and Q form the top and bottom of chamber R, the plate Q being arranged slightly above the discharge 2.

Close to the plate M, and usually immediately above the same, I arrange a felt diaphragm, *m*, which removes at once all mud and sand from the water, and prevents such matter from passing into the filtering-chamber.

In the chambers N R, I place filtering material—usually gravel, charcoal, and white lake-sand in one, and crushed magnesia-stone in

the other. The water, after filling the receiving-chamber, passes up through the gravel, charcoal, and sand, and then down through the crushed magnesia-stone, where it discharges through outlet 2.

A removable cover, S, may be provided, by which access may be had to the filtering-chambers in order to cleanse or renew the same. To facilitate such access it is preferred to support plates M, O, P, and Q on lugs projecting inwardly from the case.

By dividing the case into equal sections by a central partition the water-pressure is equalized, and any clogging likely to result from an unequal pressure is avoided.

By arranging the feed-tube within the case the construction is simplified and cheapened, all joints likely to become clogged are avoided, and the apparatus may be stored in a smaller space than where the feed-tube is arranged alongside of the filter-case.

The bottom of the pan G forms a perforated diaphragm, and may be easily removed.

By supporting the spring bucket and valve directly from the pan such devices may be easily removed for any desired purpose.

The filtering material is preferably disposed as follows: Upon the felt diaphragm I place a layer of coarse gravel, upon that a layer of charcoal, and on that a layer of white lake-sand, the sand layer being usually of about eight inches in depth, and the other two (charcoal and gravel) of six inches each. It is preferred to use the crushed magnesia-stone because of the great power such material has to neutralize all offensive odors. By its use stagnant and offensive water may be rendered pure, sweet, and free from all germs of disease. It will be noticed that the mouth of the pipe which discharges into the feed-tube is made larger than the bucket I, in order that the water discharged into said feed-tube will pass into and also alongside of the bucket. The object in this formation of the discharge-pipe is, that a portion of the first water entering the filter will serve to flush the receiving-chamber E thereof, while the water contained in the bucket when the supply of water ceases will also flush the said chamber at such time.

Having thus described my invention, what I claim as new is—

1. The combination, in a filter, with the case, of a valve-carrying bucket and a spring suitably secured at one or its upper end, and having its lower end connected with the bucket, said spring serving the double purpose of a connection for the bucket and as a yielding support therefor, substantially as and for the purposes specified.

2. A filter comprising a case, A, a feed-tube leading into and partially incased by said case, a valve-carrying bucket located in said tube, and a spring connected at one end with the feed-tube and at its other or lower end to the bucket, said spring being incased within the tube and serving the double purpose of a connection for the bucket and as a yielding support therefor, substantially as and for the purposes specified.

3. The improved filter herein described, consisting of the case A, having legs 4, whereby its bottom is held clear of a support, an outlet-tube, 1, leading from said case, a check valve or trap in said tube, a conical seat surrounding the opening into tube 1, the bucket, the valve-ball having a chain-connection with the bucket, and a yielding support for the bucket, substantially as set forth.

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Witnesses:
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