C. C. TITTLE & J. F. NOLTE.

WATER-FILTERS.

No. 194,016. Patented Aug. 7, 1877.

Fig. 1

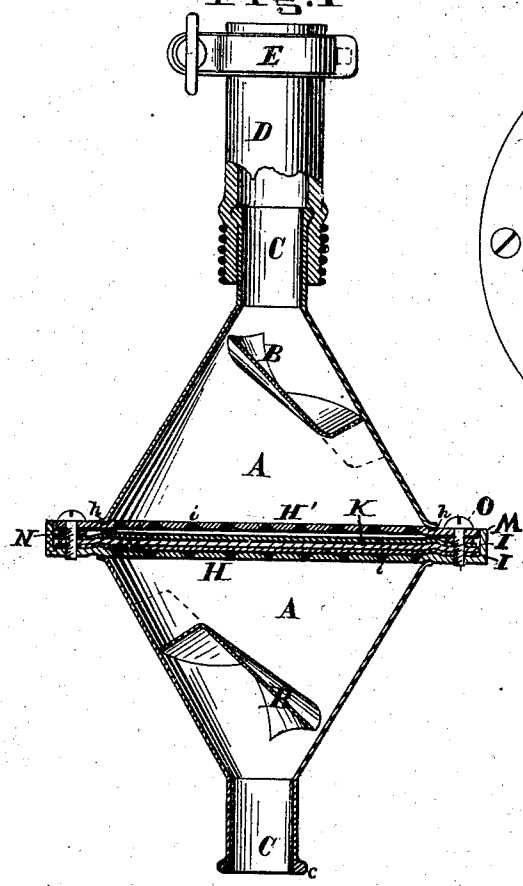


Fig. 2

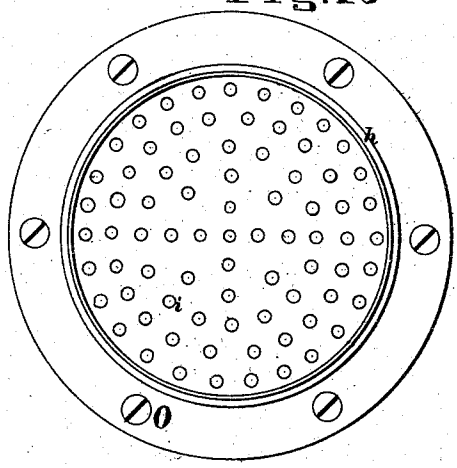


Fig. 3

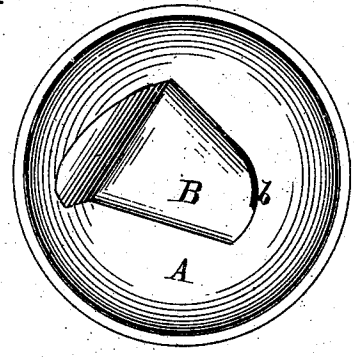


Fig. 4

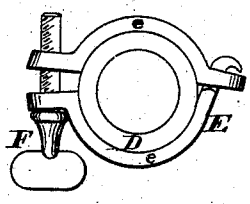
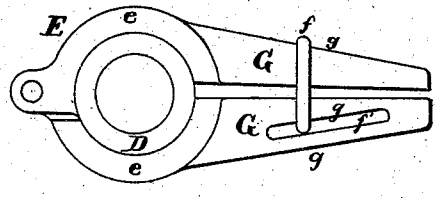


Fig. 5



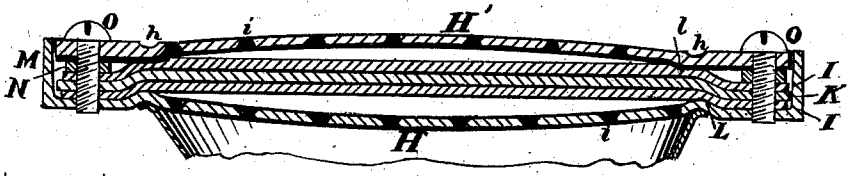


Fig. 6

Attest

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UNITED STATES PATENT OFFICE.

CHRISTOPHER C. TITTLE AND JOHN F. NOLTE, OF CINCINNATI, OHIO.

IMPROVEMENT IN WATER-FILTERS.

Specification forming part of Letters Patent No. **194,046**, dated August 7, 1877; application filed June 27, 1877.

To all whom it may concern:

Be it known that we, CHRISTOPHER C. TITTLE and JOHN F. NOLTE, both of Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Water-Filters, of which the following is a specification:

Our invention relates to that class of filters designed to be attached to a hydrant or nozzle of a force-pump, and constructed with two similar chambers on either side of a filtering-diaphragm, which construction enables it to be reversed when choked with sediment, thus allowing the force of the water to wash out the accumulated sediment through the same opening it came in at.

It consists, essentially, of a metallic casing of double cone shape, said cones being attached at their bases each to a perforated circular plate of cast-iron, brass, or other inflexible metal, between which plates are placed two pieces of felt, cloth, or similar material, inclosing a disk of asbestus board prepared for this purpose, with plaster-of-paris and London cement, as hereinafter described; also, of a breakwater or agitator near the apex of each cone, and directly opposite the openings, forming an inclined gutter, imparting to the water as it strikes it a circular motion, which prevents the sediment from settling, and distributes the water evenly over the plate.

As in other filters of this type, we attach a short piece of hose on the tube or neck at the end of each cone; but we also add a clamp of our own invention, consisting of two arms having inclined surfaces, one arm being provided with a link sliding in a slot, and adapted to bind the two arms together.

In the accompanying drawing, Figure 1 represents a vertical section of our improved filter; Fig. 2, a plan view of the perforated plates. Fig. 3 is a plan view of the conical casings, showing our agitator. Figs. 4 and 5 show devices for clamping the hose, and Fig. 6 is a sectional view of the perforated plates on a large scale.

A A are two precisely similar casings of conical shape, made of galvanized iron or other non-corrosive sheet metal, and having the agitators B B soldered to them directly opposite the openings in the ends of the vessel. The casings terminate near their apex in narrow necks C C, to which is attached a short piece of hose, D, that forms a connection between the filter and hydrant or pump. The tubes C C have a collar or flange, *c*, on their edges to prevent the hose slipping off when it is once "wired" on.

To hold the hose D securely on the cock or nozzle without the need of a screw-thread, we provide a metallic clamp, E, consisting of two semicircular pieces, *e e*, which may be provided with a thumb-screw, F, as shown in Fig. 4; but in our preferred form, as shown in Fig. 5, the semicircular pieces *e* and *e* are carried out into two arms, G G, having inclined surfaces *g g*, and one being provided with a link, *f*, sliding in slot *f'* for binding the two arms together, as shown.

The conical casings A A are soldered, or otherwise attached to galvanized iron, brass, or other non-corrosive cast-metal plates H and H', and to prevent lateral displacement are made to fit into grooves *h h* cast for that purpose in the plates.

Said plates H and H' are made of cast metal, for the reason that plates of tin, copper, wire-gauze or other flexible material, would be deflected by the great pressure of water every time the filter is reversed, and hence would soon wear out and break around the edges.

These plates are made preferably of slightly-bulging shape, being concave on the inner and convex on the outer surface, and one of them, H, is cast with a cylindrical rim or flange, M, around its edge, thus forming a casing into which the diaphragms I and K and plate H' are made to fit; and when a heavy pressure is brought to bear on plate H', it will be forced in so as to be flush with the edge of the flange M, in which position it is secured by bolts or set-screws O. The plate H has a circular ridge, L, and the plate H' has a circular offset, *l*, corresponding in position on the inside of said plates with the annular grooves *h h* on the outside. The perforations *i* in the plates H and H' are wider on the inside than on the outside, to allow the water free access to the filtering material.

The annular space between the ridge L and rim M is occupied by an india-rubber gasket, N, lying between the diaphragms I I K and

the plate H′, through which pass the set-screws O that hold the plates together. The gasket N, together with the ridge L, binding on the disks or diaphragms I I K, effectually prevent the escape of water around the edges as well as the shrinkage of the said disks.

The diaphragms I I can be made of felt, cloth, or other suitable material; but we prefer to use what is known as "jacketing." After passing through the cloth I I, the water comes in contact with a disk of asbestus board, K, prepared as follows: The impermeable outside layer of asbestus board is removed and the remainder is dipped in a mixture of plaster-of-paris, a small quantity of London cement and water, and this, when dried, forms a stiff, porous, and durable filtering material. The plaster-of-paris with the London cement are necessary to prevent the washing away of the asbestus, while at the same time they do not detract from its filtering qualities.

In previous asbestus filters, the asbestus has only been used in its granulated state, and consequently would gather into one mass, leaving many places for the water to go through unfiltered; but by making it in one disk and clamping it around the edge, we prevent all danger of any leakage.

The agitator or breakwater B (shown in Figs. 1 and 3) has an opening, *b*, in the corner nearest the apex, to prevent sediment lodging there when the filter is inverted.

The clamp E facilitates the attachment of the hose to the water-cock, and also adapts the filter for use in many places where without the clamp it would be useless.

When the accumulation of sediment stops the further flow of water, the clamp E is removed, the filter reversed, and the hose on the opposite end is clamped to the hydrant-cock. The mud that has accumulated in the chamber where the water entered will be quickly washed out and the operation of filtering will go on as before.

We claim as new and of our invention—

1. A filtering diaphragm made of asbestus board prepared with plaster-of-paris and London cement, as described.

2. In a reversible filter, the perforated plates H and H′ of cast metal, and provided with rim M, for inclosing the filtering diaphragms.

3. In a reversible filter, the breakwaters or agitators B B, adapted to give the water a spiral motion, for the purpose set forth.

4. In combination with the reversible filter and connecting-hose, the clamp E, provided with arms G G, having inclined surfaces *g g*, one arm being provided with a slot, *f′*, and link *f*, adapted to bind the arms together, as and for the purpose set forth.

5. In a reversible filter, the plates H and H′, provided with ridge L, and offset *l*, and grooves *h h*, as described and shown.

In testimony of which invention we have hereunto set our hands.

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