W. Rice,

Water Filter.

No. 24,489. Patented June 21, 1859.

Fig: 1.

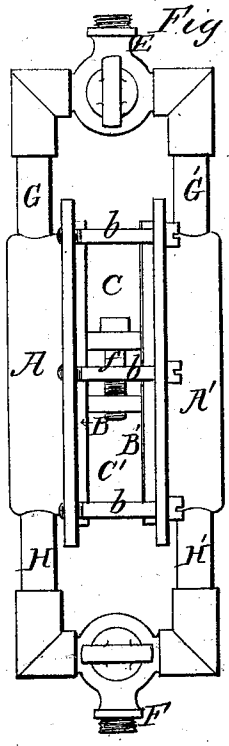


Fig: 2

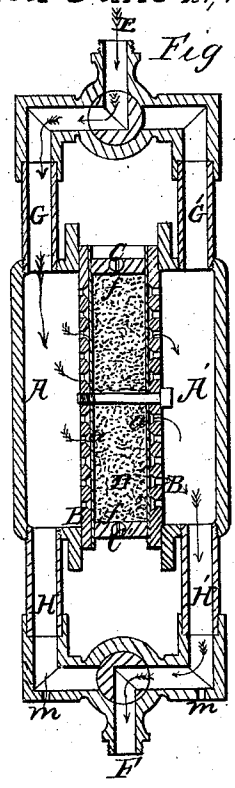


Fig: 3.

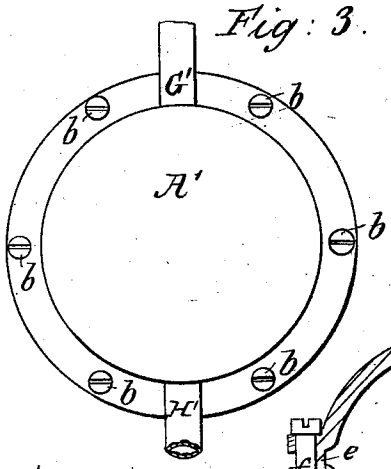


Fig: 4.

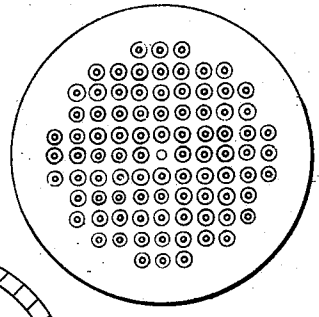
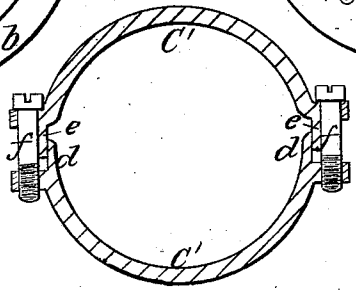


Fig: 5.



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UNITED STATES PATENT OFFICE.

WILLIAM RICE, OF PHILADELPHIA, PENNSYLVANIA.

FILTER.

Specification of Letters Patent No. 24,489, dated June 21, 1859.

To all whom it may concern:

Be it known that I, WILLIAM RICE, of the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Filters; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

My invention consists in a certain arrangement of two casings with perforated plates on the inside and a body of sand confined between the plates, together with a system of pipes, and three way cocks, fully described hereafter, whereby the water may be directed, first in one direction and then the other, through the sand, which is thereby cleansed.

The sand is confined between the plates by means of a ring which can be contracted at pleasure thereby compressing the sand into that dense and compact mass which renders it most available for filtering purposes.

Two openings described hereafter serve to carry off much of the impurities which would otherwise pass into the sand.

In order to enable others to make and use my invention I will now proceed to describe its construction and operation.

On reference to the accompanying drawing which forms part of this specification.—Figure 1, is an edge view of my improved filter. Fig. 2, a sectional view. Fig. 3, a face view of part of the filter, and,—Figs. 4 and 5, detached views of portions of the filter.

Similar letters refer to similar parts throughout the several views.

A and A′, are two metal casings of a circular, or other convenient form, and between these two casings intervene the perforated plates B, and B′, the wire gauze disks *a*, and *a′*, and the ring C, which incloses a body of sand D. The above parts are secured together by bolts *b*, *b*, passing through flanges on the casing A, and A′, the perforated plate or disk B, resting against the inside of the casing A, the perforated plate B′, against the inside of the casing A′, and the sand being prevented from passing through the perforations of these plates, by the wire gauze above alluded to.

The ring C, is of the peculiar construction illustrated in Fig. 5, on reference to which it will be observed that it is made in two halves secured together by bolts *f*, *f*, the projections *d*, *d*, of one half fitting over the projections *e*, *e*, of the other half, so that the ring may be expanded and contracted at pleasure without any of the sand escaping at the joints.

E, is the inlet and F, the outlet pipe of the filter the inlet pipe being connected to the pipe G, which communicates with the interior of the casing A, as well as to the pipe G′, which communicates with the interior of the casing A′.

The outlet pipe F, is connected to the pipes H, and H′, the former of which communicates with the interior of the casing A, and the latter with the interior of the casing A′.

In order that a body of sand may act as an efficient filtering medium it is necessary that it be compressed into a compact and solid mass. This is accomplished by means of the ring C.

When the sand is first placed between the wire gauze disks *a*, and *a′*, the bolts *f*, *f*, are inserted and the two halves of the ring C, moved outward so far from each other that the ends of the projections *d*, of one half just overlap the ends of the projections *e*, of the other half of the ring.

After the opposite casings A, and A′, with the perforated plates and wire gauze disks have been adjusted the screws *f*, *f*, are turned so as to bring the two halves of the ring closer together and thereby compress the sand into a solid mass.

The density of the body of sand may at any time be increased by tightening the screws *f*, *f*, and this without disturbing the casings or the system of pipes.

At the junction of the inlet pipe with the pipes G, and G′, is a three way cock a similar cock being situated at the junction of the pipes H, and H′, with the outlet pipe F.

As seen in Fig. 4, the cocks are so turned that the water entering the inlet pipe shall pass down the pipe G, into the interior of the casing A, thence through the perforated plate B, and wire gauze disk *a*, through the body of sand D, through the gauze disk *a′*, and perforated plate B′, into the interior of the casing A′, down the pipe H′, and out at the exit pipe F. After the water has taken the above direction for a sufficient length of time to cause the sand to be impregnated with the impurities of the water, the cocks are so turned that the water from

the inlet pipe shall pass down the pipe G, through the perforated plates, gauze, and sand, in a contrary direction to that above described, thus driving out the impurities; the water being allowed to take this course until another reversal of its direction becomes necessary. When the sand has become so thoroughly impregnated with impurities that a complete cleansing is necessary it may be withdrawn after unscrewing the bolts *f*, and removing one half of the ring, and when the sand is washed it may be easily replaced and compressed to its original density.

In filters of a larger class I make an opening at the top of the upper half of the ring, and a similar opening at the bottom of the lower half of the ring, both openings being covered by a movable valve or door, so that when the sand has to be cleaned it may be withdrawn at the lower opening, and reinserted after being cleansed through the upper opening, thus dispensing with the necessity of disturbing the rings.

It will be observed that the lower ends of the pipes H, and H′, are each furnished with a small orifice *m*, which always remains open allowing a small stream of water to escape which carries with it much of the impurities which would otherwise be deposited in the sand.

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

1. The general arrangement of the two casings, the perforated plates, the wire gauze, body of sand, the system of pipes, and three cocks herein-before described.

2. Confining a body of sand D, between the perforated plates B, and B′, by means of a ring C, constructed in the manner set forth or any equivalent thereto by which the said ring may be made to compress the body of sand without disturbing the said perforated plates.

3. The orifices *m*, *m*, at the lower end of the pipes H, and H′, for the purpose specified.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

WM. RICE.

Witnesses:
HENRY HOWSON,
CHARLES D. FREEMAN.