(No Model.)

E. M. KNIGHT.

FILTER.

No. 419,266. Patented Jan. 14, 1890.

Fig. 1.

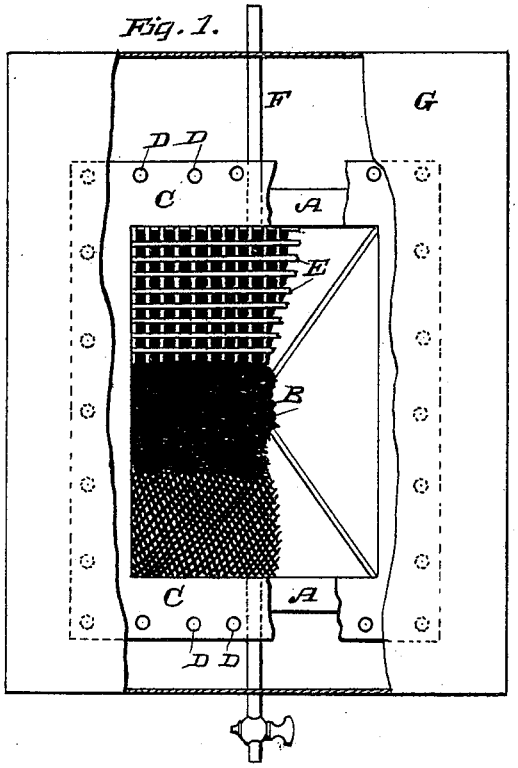


Fig. 2

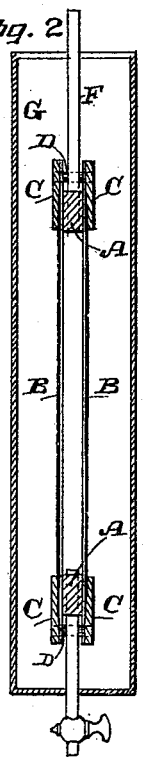
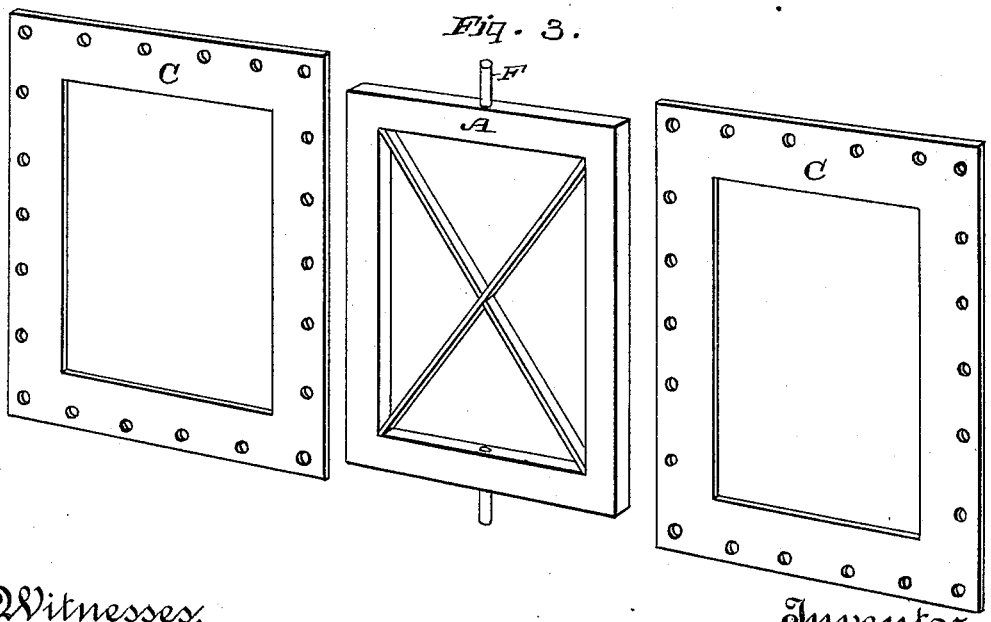


Fig. 3.



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UNITED STATES PATENT OFFICE.

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FILTER.

SPECIFICATION forming part of Letters Patent No. 419,266, dated January 14, 1890.

Application filed March 9, 1889. Serial No. 302,671. (No model.)

To all whom it may concern:

Be it known that I, EDWARD M. KNIGHT, of the city of San Mateo, county of San Mateo, State of California, have invented an Improvement in Filters; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of filters in which a fibrous or porous material is employed as the filtering medium; and my invention consists in the construction and combination of devices which I shall hereinafter fully describe and claim.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a view showing the side of one of the filters and a part of the inclosing-case broken away. Fig. 2 is a transverse section taken vertically through the filter and its inclosing-case. Fig. 3 is a view of parts of the filter-frame.

To construct my filter, I take a frame A, which may have any desired number of transverse bars extending across it to act as a support for the filtering-surfaces B, which are placed upon opposite sides of this frame. The frame is of sufficient thickness to insure a considerable space between the surfaces B B, into which the water or liquid to be filtered will flow through the filtering-surfaces. The frame may also have such superficial area as is desired. The filtering-surfaces consist of asbestus or other fibrous cloth, which is stretched over each side of the frame A, and is then secured in place by means of the frames C in the form of open parallelograms, which are laid upon the opposite edges of the frame A and the fibrous filtering-sheets B, which extend over these edges, and are then secured firmly together by bolts D, passing through the frames A and C and held by nuts.

Upon the surface of the asbestus or other fibrous cloth I place a layer of filtering medium, which may be applied in the form of a paste, and which will retain its place by reason of being brushed into the fibers of the cloth and by the percolation of the water through it, and also because it is kept perpetually moist when in use. Sometimes I find it advisable to place over each side a netting E, of wire, to help sustain the filtering medium, which, owing to the frame being in a perpendicular position, would be liable to fall when of any considerable thickness. This method allows of a much thicker layer of filtering medium to be used than otherwise could be. This makes the chamber between the opposite sides of the filtering material, into which the water flows as it passes through the filter, and by reason of the manner in which the edges are bolted together no liquid can reach the interior of this chamber without first passing through the filter.

In order to aerate the water after it has passed through the filter, a pipe F is fitted into the upper edge of the frame A, this pipe opening into the space between the filtering-sides and extending up high enough to prevent any water from flowing into it from above. The water is discharged by means of a similar pipe or cock connected with the lower side of this space, preferably through the frame A. The device, being complete, is then submerged in a containing-vessel G, into which the water is admitted, so that it will flow through the filtering-sides and into the interior of the chamber, and as it flows out through the bottom the action will draw in air through the pipe F at the top, and thus provide a sufficient supply for properly aerating the water. The chamber G, at all times being made in proportion to the filter-frame contained in it, prevents the liquid being forced through the filter by pressure and renders the filtration of the liquid uniform.

The tank G may be as large as is desired, and as many filters may be placed within the tank as is found desirable, each filter being contained in its own inclosing-case.

If it is desired to cool the water, it is done by means of any suitable refrigerating device which will produce the desired result.

The filtering-frames A, with their fibrous filtering-sides B, are easily removed from the tanks or chambers in which they are placed when at work for the purpose of cleansing if they become covered with deposits, and the filtering-medium coating may be renewed at pleasure. I prefer to make these frames of iron and to employ asbestus cloth as the

fibrous filtering material. This enables me to easily cleanse the filter by plunging it into the fire, if this course be found desirable, as no portion of the filter can be destroyed by this action, and the surfaces will be entirely cleansed of any undesirable deposit.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

A filter consisting of asbestus cloth or other fibrous material and an exterior coating of filtering medium in the form of paste spread upon the cloth and an exterior cover of wire screen to uphold the medium, substantially as herein described.

In witness whereof I have hereunto set my hand.

EDWARD M. KNIGHT.

Witnesses:
GEO. H. STRONG,
S. H. NOURSE.