J. CRAWFORD.
Water-Filters.

No. 199,519. Patented Jan. 22, 1878.

Fig. 1

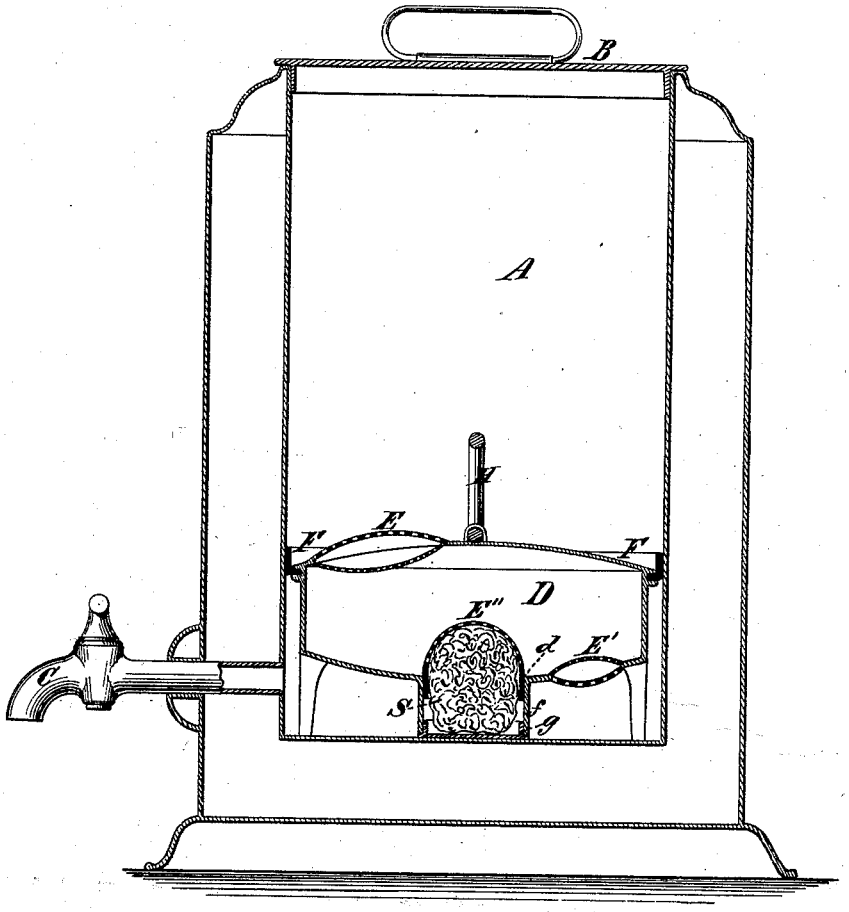
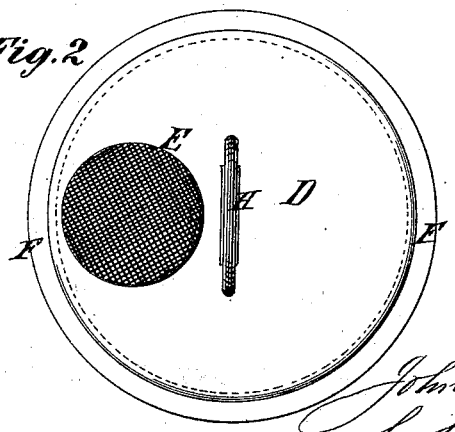



Fig. 2

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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN WATER-FILTERS.

Specification forming part of Letters Patent No. **199,519**, dated January 22, 1878; application filed July 10, 1877.

*To all whom it may concern:*

Be it known that I, JOHN CRAWFORD, of the city and State of New York, have invented an Improvement in Water-Filters; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

My invention is more especially intended for application to water-coolers containing ice for keeping water cool; but it is also applicable to refrigerators, and to other receptacles for liquids.

The invention has for its object the supply of a convenient, durable, cheap, and effective filter, which may be easily cleaned, and which, when used in connection with water-coolers and refrigerators, filters the water produced from the melting ice, as well as the additional water cooled by the ice.

The construction and operation of the filter are substantially the same in all its applications, and it will therefore be a sufficient illustration of the invention to describe it as applied to a common water-cooler.

Figure 1 in the drawing represents a central vertical section through a water-cooler having applied thereto my improved filter. Fig. 2 is a top view of the filter detached and removed from the cooler.

A is the cooler, formed with non-conducting materials, placed in a hollow wall in the usual manner, having a cover, B, and a cock, C, for drawing water from the same. D is the filter-box, which is made of plate tin, copper, galvanized sheet-iron, or any other suitable material, and having in the central part of its bottom an opening, *d*, through which filtering material of any kind may be placed in the said filter-box, and which opening is closed while the filter is in use, as hereinafter described.

Both the top and bottom of the filter-box are preferably made convex on their outer sides; but this feature is not essential to the working of the filter, although it works better when made in this way.

In the top of the box D is inserted, at one side, a double-convex strainer, E, of wire-gauze, perforated metal, or other suitable material, and in the bottom of the box, at the opposite side from that in which the strainer E is inserted, another strainer, E′, is also inserted. The opening *d* is tubulated, the short tube *f*, which extends downward from the same, being supplied with a cap, *g*, for closing said tube. Said cap may be either a screw-cap or merely a cap formed with a rim to fit the tubule *f*. Within said tubule, and extending somewhat up into the interior of the box D, is a concavo-convex strainer, E″, so fitted within the tubule that it cannot be pushed through into the interior of the box.

In use I prefer to insert a piece of sponge, S, in the tubule *f* between the cap *g* and the strainer E″.

To the upper and outer border of the box D I attach a flat ring, F, preferably of elastic rubber, but which may be of any other flexible material. In the larger sizes of filters I also attach legs to the bottom of the filter, upon which the box rests when in use; but in the smaller sizes the tubule *f* forms a sufficient support for the box.

When the box D is pushed downward within the cooler, as shown in Fig. 1, the flexible rubber ring F turns upward on the inside of the cooler, and forms a perfectly-tight cup-packing, which prevents any communication from the part of the cooler above the filter to the space below said filter, except through the strainers E E′ and the box D. To the top of the filter-box D is attaehed a handle, H, for withdrawing the same from the cooler or refrigerator in which it is placed.

The interior of the box is, in use, filled with any suitable filtering material, different materials being employed for different qualities of water to be filtered. When the water contains only mechanical impurities, any of the ordinary filtering materials for removing such impurities may be employed; but when the water contains organic impurities in solution, animal or vegetable charcoal or other materials suitable for rendering the water pure may be placed in the box.

Whether used in a water-cooler or in a refrigerator, the ice is always placed above the filter, in order that the water melting from the ice and the water cooled by the same may be filtered.

The filter thus constructed presents the following advantages: It supplies a cheap, convenient, and durable filter for the water-coolers almost universally used in hotels, railway-stations, and offices, and for refrigerators, or for any other kind of vessel, its horizontal configuration being made of a form to fit the cooler, refrigerator, or vessel in which it is to be used. It is easily cleaned and kept clean, all its parts being readily accessible for cleansing. It effectively filters both the water in which the ice is put for cooling purposes and the water melted from the ice, removing therefrom the mechanical and organic impurities with which ice is not infrequently contaminated, the pure cold filtered water being drawn from the space below the filter.

The upward convexity of the top and bottom is useful in directing the coarser impurities away from the strainers, such impurities gravitating into the gutter or depression around the edge of the top of the filter-box adjacent to the upturned cup-packing F, and also in the center of the bottom of the box around the tubular opening *d*, where they pass through the strainer E″, and are retained by the sponge S. The said sponge may be removed as often as desired for the washing without disturbing the filtering material contained in the box D until such time as it may be desirable to change said filtering material. The upper portion of the double-convex strainer E is more coarsely perforated than the lower portion, and the lower portion of the strainer E′ is more coarsely perforated than the upper portion, the outermost portions performing the function of protectors for the inner ones to protect the latter from injury.

I claim—

The filter-box D, in combination with the double-convex strainers E E′, the central tubular opening *d* in the bottom of the box, the strainer E″ inserted in the said tubular opening, and the cap *g* for closing said opening and retaining in the tubule *f* the sponge S, substantially as and for the purpose specified.

2. The combination, with a box for containing filtering material and strainers for permitting the flow of water through the box, of a flexible or elastic cup-packing ring, F, attached to the said box, substantially as and for the purpose set forth.

3. The combination, with a vessel for containing water or ice, or both, of the filter-box D, constructed with the strainers and tubulated opening and packing, substantially as described, and supported in the vessel above the bottom, to leave a space for filtered water, substantially as and for the purpose set forth.

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