

J. F. CREASE.
CONSTRUCTION OF FILTERS.

No. 172,849.

Patented Feb. 1, 1876.

FIG. 1.

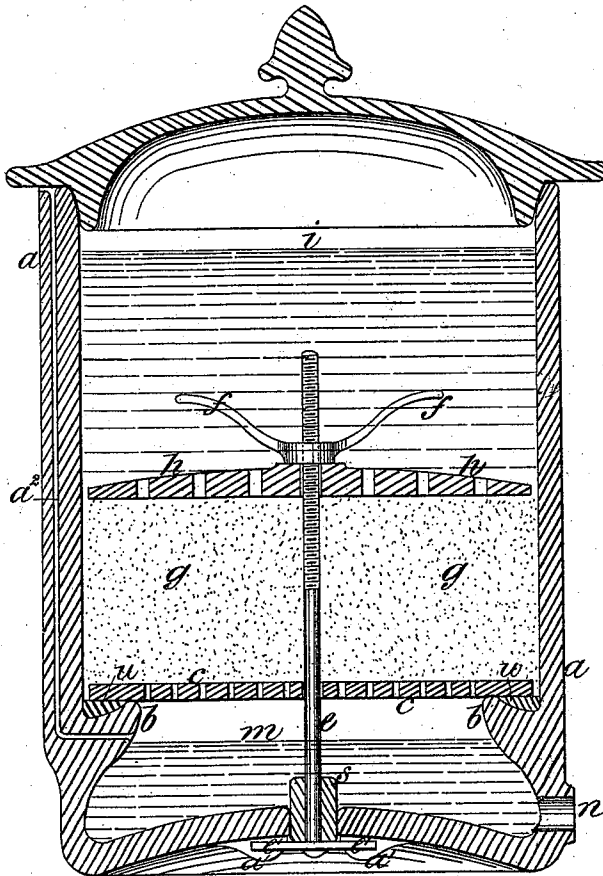
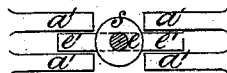


FIG. 2.



Witness
Alay Smith
D. R. Cowl

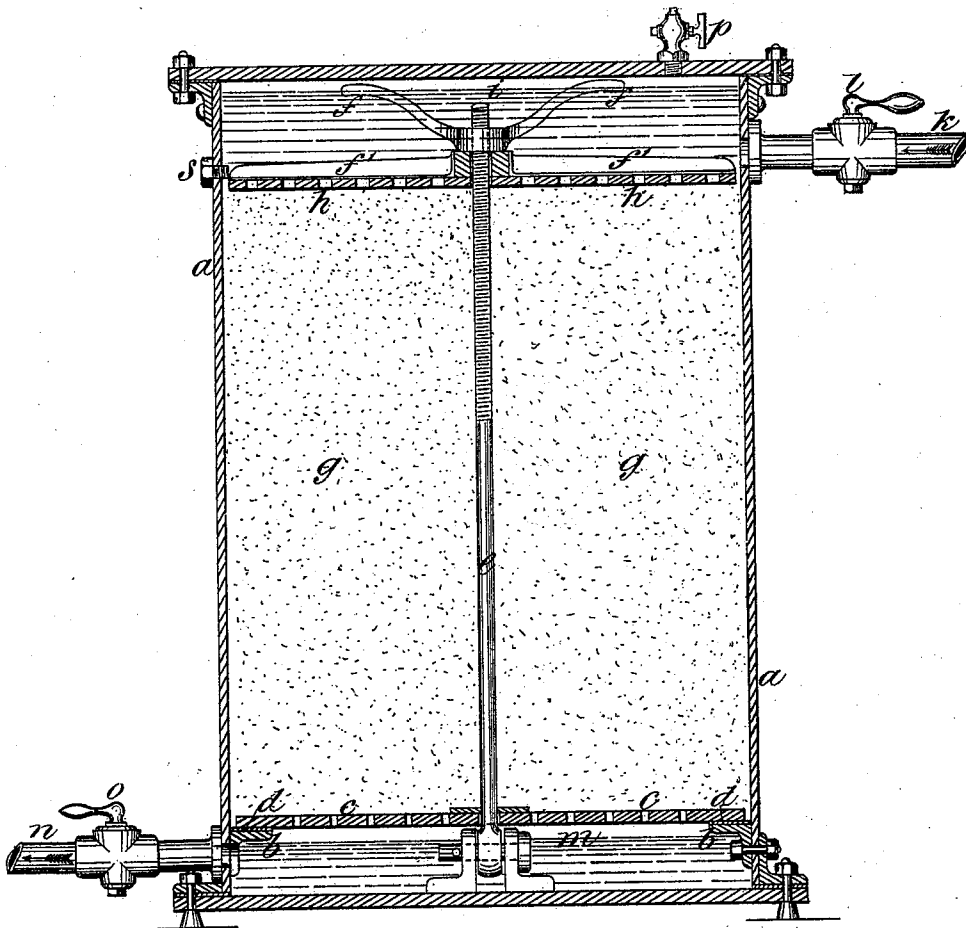
John Frederick Crease
By his atty. J. Johnson

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FIG. 3.



Witness
Attest
D. R. Cowell

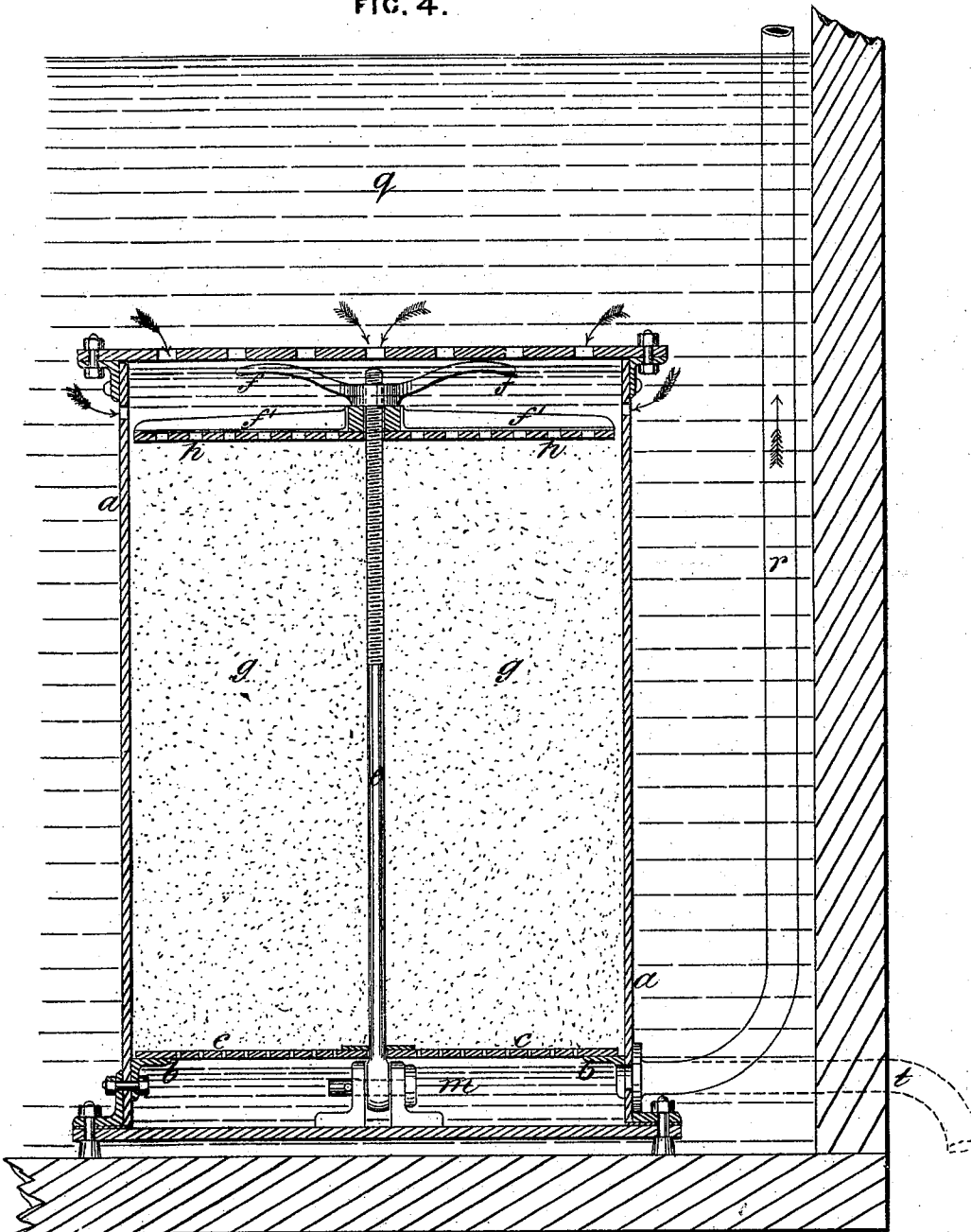
John Frederick Crease
By his Atty J. D. Watson

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FIG. 4.



Witness
A. Clay Smith
D. P. Cleaveland

John Frederick Crease
By his atty. J. D. Stetson

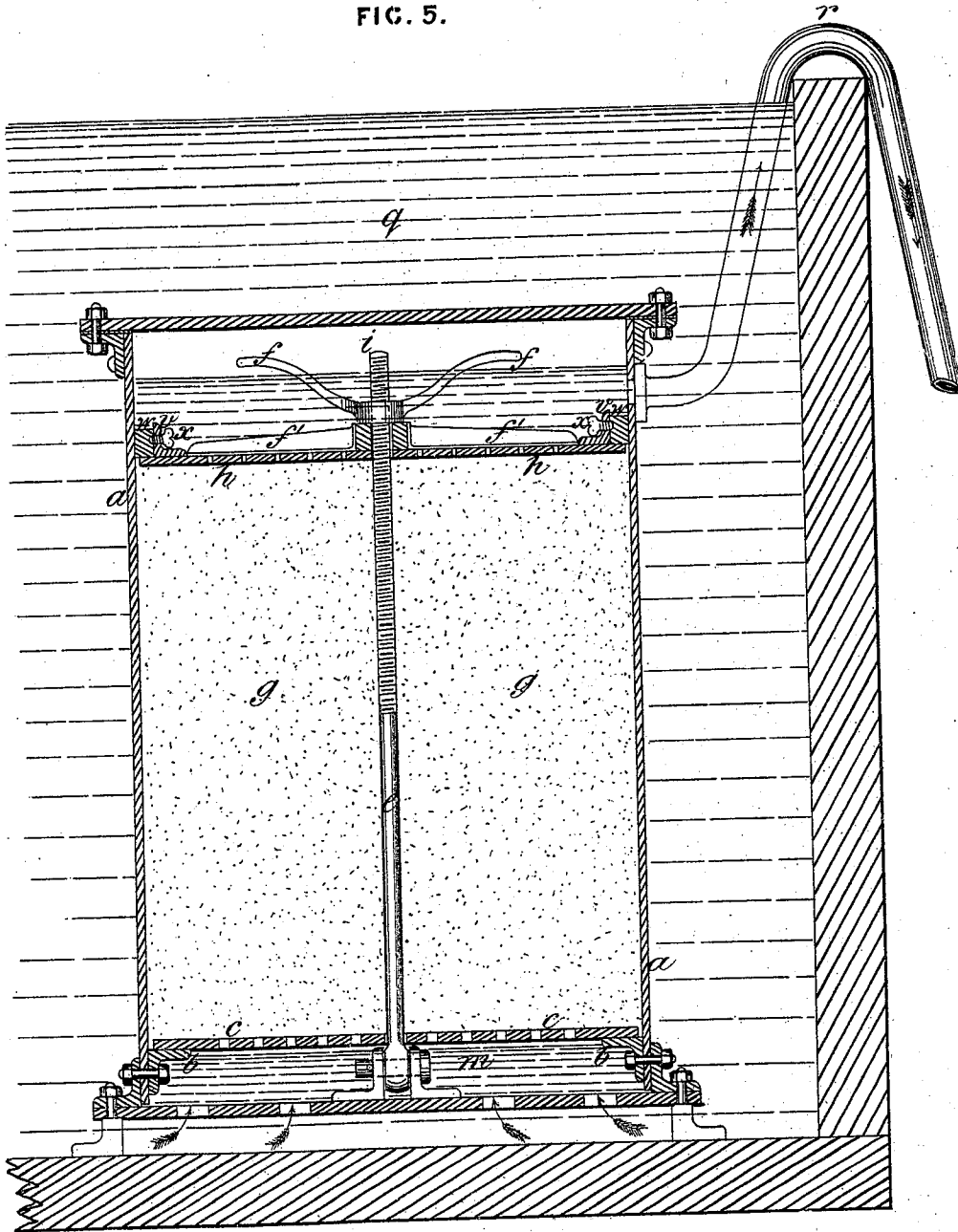
J. F. CREASE.

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No. 172,849.

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FIG. 5.



Witness
O. Day Smith
D. P. Cowell

John Frederick Crease
By his atty (J. D. Sturton)

UNITED STATES PATENT OFFICE.

JOHN FREDERICK CREASE, OF EASTNEY, GREAT BRITAIN.

IMPROVEMENT IN THE CONSTRUCTION OF FILTERS.

Specification forming part of Letters Patent No. **172,849**, dated February 1, 1876; application filed September 15, 1875.

To all whom it may concern:

Be it known that I, JOHN FREDERICK CREASE, of Eastney, in the county of Southampton, Kingdom of Great Britain and Ireland, major in the army and captain in the royal marine artillery, have invented new and useful Improvements in the Construction of Filters, of which the following is a specification:

I provide convenient means by which the plates which compress the filtering material are not only compressed together, but the whole is pressed forcibly downward, so as, by the aid of a simple ring of packing, to make a tight joint around the lower plate. I provide, also, by a passage formed in the body of the vessel, for admitting air to facilitate the rapid discharge of the filtered water.

The accompanying drawings represent what I consider the best means of carrying out my invention. They show a filter adapted to receive the water by occasional pouring, and also modifications containing part of the improvements adapted to receive the water by other means. All the forms are so constructed as that every part shall be accessible to the user, and are especially designed to enable any person, however unskilled, to clean them, and, when necessary, renew the filtering material within them, without having to call in the aid of a filter-maker; also, to readily adjust the filters from time to time, according to the degree of impurity of the water or liquid to be filtered.

Within a vertical vessel constructed of earthenware or other like material—or it may be of metal lined with cement—I provide, at a suitable distance from the bottom of the vessel, a ledge (or ledges) or projection formed with or attached to the vessel, and properly arranged to receive and support a perforated plate or false bottom. Vulcanized india-rubber or other suitable packing is interposed between the perforated plate or false bottom and the ledge.

A rod (or there may be more than one) passes up through the perforated plate or false bottom. The lower end of this rod is held down by attachment to the bottom of the vessel, or it may be prevented from being either turned or drawn upward by being passed through a square, polygonal, or other hole in a bridge or

cross-piece formed with or attached to the vessel, and running transversely below the perforated false bottom, the end of the rod below the bridge or cross-piece being screwed or wormed and provided with a nut or other well-known means for retaining it in place. The upper end of the rod is, for some considerable distance, formed with a screw-thread fitted with a correspondingly-screwed handle or nut.

The filtering material is placed above the perforated false bottom upon which it rests.

The filtering material I prefer to use is best prepared granulated animal charcoal.

Above the filtering material is placed a perforated plate or slab, the holes in which may, if necessary, be of somewhat larger diameter than those in the false bottom.

The upper end of the screwed rod passes through this perforated plate or slab, above which the handle or nut is placed, and is screwed down onto the perforated plate or slab, so as to compress the filtering material between it and the perforated plate or false bottom, as well as to secure the filtering-bed in its proper place in the vessel.

The thickness of the bed of filtering material to be placed above the perforated plate or false-bottom, and the degree to which it should be compressed, will depend upon the amount of impurity contained in the water or liquid to be filtered.

The thickness of the bed or layer and the extent of compression may be readily adjusted by any person by simply removing the screwed handle or nut and perforated plate or slab, reducing or increasing (as the case may be) the quantity of filtering material, and then replacing the parts, screwing down the handle or nut more or less tightly, according to requirement.

The top cover of the vessel may be made to fasten in position by bolts or otherwise, or not to fasten, according to circumstances.

Figure 1 of the drawings shows one of my filters in central vertical section.

a is the main vessel, which in this case is made of earthenware, with a ledge, *b*, the top part of which is channeled and filled with packing, *u*, to receive the perforated slab or false bottom *c*. *e* is a rod, whose lower end is formed with a head having projections *e'*, entering

spaces between projections a' formed on the filter-bottom, as shown in the plan view, Fig. 2. The rod passes up through a hole in the bottom of the filter, where the joint is made tight by a tapering packing, s . The rod also passes up through the perforated slab or false bottom c , and at its upper end is formed with a screw-thread, onto which is fitted a correspondingly-screwed handle, f . g is the filtering material, above which is placed the upper perforated slab h .

The filter thus constructed presents an upper chamber, i , for receiving unfiltered water or liquid, and a lower chamber, m , for filtered water or liquid, which may flow out at n , regulated by a tap in the ordinary way, the two chambers i m being of sizes according to circumstances, and separated from each other by an adjustable space containing the filtering material g .

a^2 is an air pipe or passage formed in the body of the vessel a , or permanently fixed thereto and making a part thereof, communicating up and down, its upper end being above the surface of the unfiltered water.

Fig. 2 is a plan view of the exterior parts under the bottom. Fig. 3 shows a modification of the above filter.

In this case the main vessel a is made of wrought-iron, with top and bottom flanges, to which the top and bottom covers are respectively bolted. This vessel is lined with Roman, Portland, or other like cement. The ledge b is of angle-iron, bolted (or it may be riveted) to the lateral part of the vessel, to receive and support the perforated plate or false bottom c , between which and the ledge is interposed, if found necessary, a ring, d , of vulcanized india-rubber to form a tight joint. The rod e is attached at its lower end, as shown, to the bottom of the vessel a .

f is a strong metal cross, interposed between the screwed handle f and the upper plate or slab, for the purpose of distributing over the plate the pressure of the handle.

Unfiltered water or liquid may be fed into the upper chamber i by a pipe or main, k , regulated by a cock, l , and the filtered water or liquid may flow from the lower chamber m by a pipe, n , regulated by a cock, o .

This form of filter may be attached to mains leading either to or from reservoir-tanks, so that there may be a constant flow of unfiltered water or liquid into the upper chamber, and a constant discharge of filtered water or liquid from the lower chamber.

p is a cock for discharging air, to obviate impediment to the flow of unfiltered water or liquid, which might otherwise arise from the accumulation of air under pressure in the upper chamber.

The upper chamber and perforated plate or

slab may be cleansed by passing a current of water from the inlet through the chamber and out through a hole, stopped by a screwed plug or by a cock, which may be provided at s for the purpose.

Fig. 4 shows a modification of the above filter arranged to be placed in a tank of unfiltered water, q . The unfiltered water can be made to flow into this filter through the top cover and upper lateral portion of the main vessel, immediately beneath the top flange, as shown, or through the cover only. The filtered water is withdrawn by a pipe on the siphon principle, as shown at r , or directly through the tank, as shown at t .

Fig. 5 shows another modification arranged to work on the siphon principle, the water or liquid to be filtered being fed in through the bottom cover, which is perforated for the purpose, and the filtered water or liquid drawn off from the upper part by the siphon-pipe r .

To obviate the carrying upward by currents of filtered water, of the granulated filtering material, which might be caused to pass out between the periphery of the upper perforated compressing-plate and the internal surface of the vessel, I apply the following arrangement: To the perforated plate I fasten an angular ring, v , so placed as to leave an annular space between its outer periphery and that of the perforated plate, to receive a packing-ring, w , of india-rubber, which is pressed against the interior of the vessel by means of thumb-screws x , carried by the angular ring, as shown.

Having described the nature of my said invention and the manner of carrying it into practical effect, I desire it to be understood that I know filters have been constructed with metal and earthenware bodies, and with perforated plates in various forms; also that the use of charcoal as a filtering medium is old.

I claim as my invention—

1. The compressing means e f , connecting the bottom of the vessel with the top plate h , in combination with the bottom plate c , supporting-ledge b , and packing u , and arranged to serve relatively to the filtering material g , vessel a , and discharge-passage n , as herein specified.

2. The rod e , with means for inducing tension thereon, in combination with the two packings s u , and with the plates h c , filtering material g , and vessel a , as herein specified.

3. The air-passage a^2 , communicating with the chamber for filtered water from a point above the level of the unfiltered water, when formed in one with the body a of the filter, as herein specified.

J. F. CREASE.

Witnesses:

W. LLOYD WISE, *London*.

F. J. BROUGHAM, *London*.