No. 659,876. Patented Oct. 16, 1900.

C. SHUMAN.

FILTER.

(Application filed May 29, 1899.)

(No Model.)

Fig. 1.

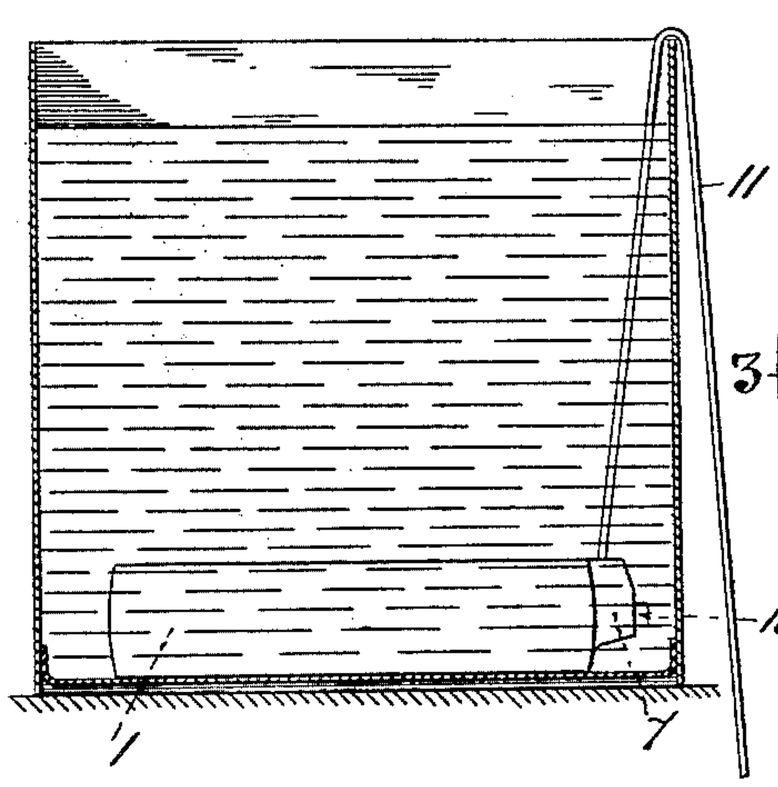


Fig. 2.

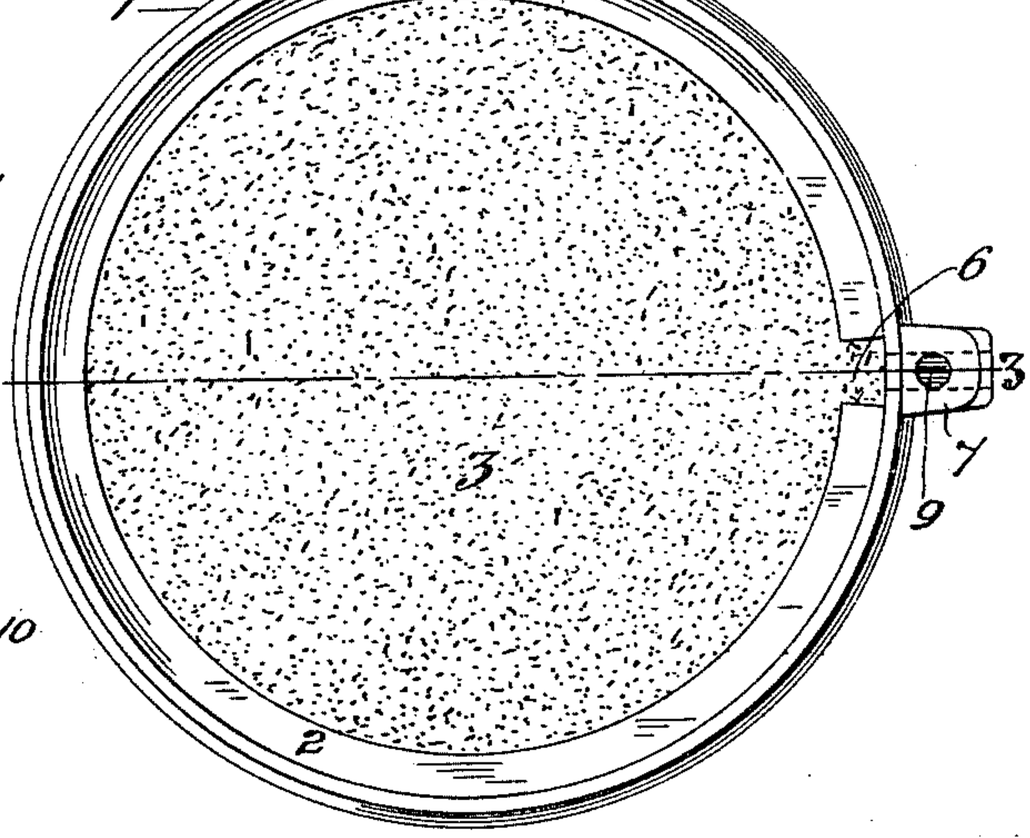


Fig. 3.

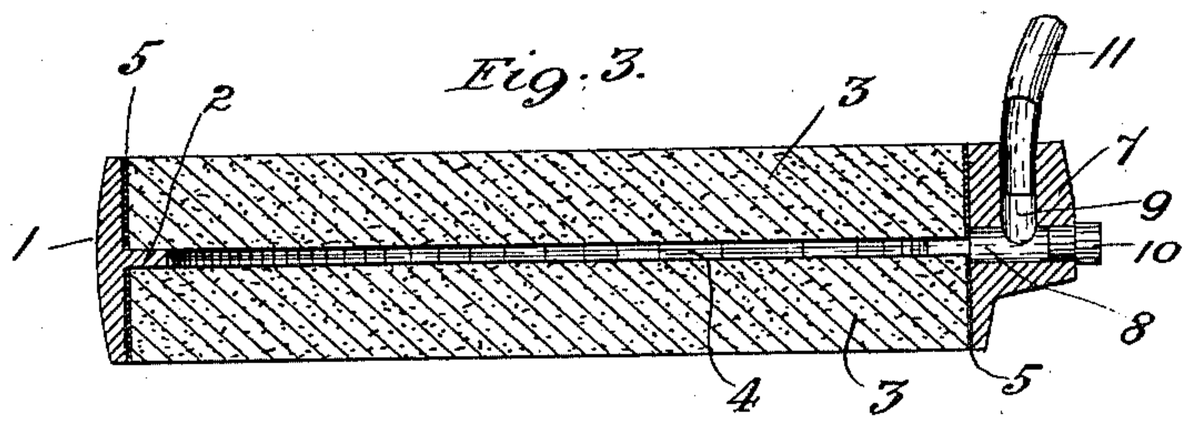


Fig. 4.

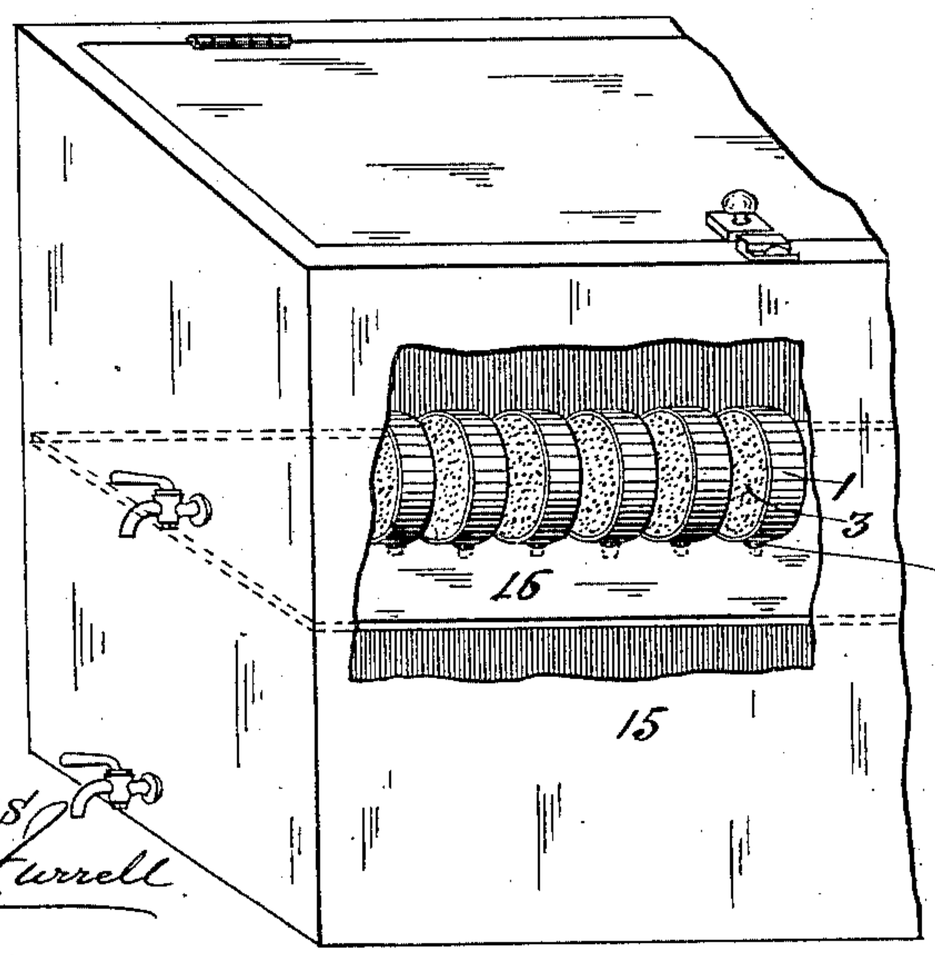
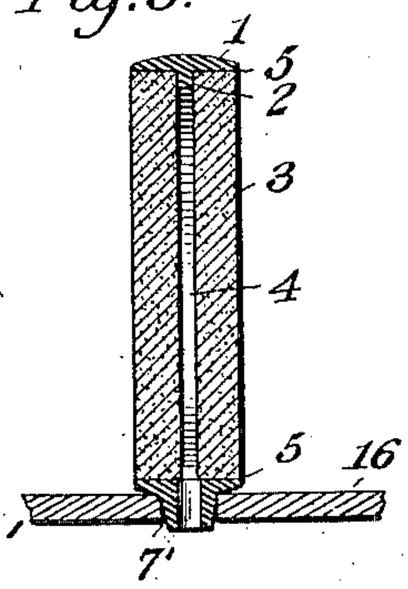


Fig. 5.



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CHARLES SHUMAN, OF ST. LOUIS, MISSOURI.

FILTER.

SPECIFICATION forming part of Letters Patent No. 659,876, dated October 16, 1900.

Application filed May 29, 1899. Serial No. 718,734. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SHUMAN, a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Filters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in filters; and it consists in the novel arrangement and combination of parts more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a sectional elevation of a tank or vessel having my filter submerged, the siphon-tube being attached thereto. Fig. 2 is a top plan view of the filter with, however, the top porous layer or diaphragm removed. Fig. 3 is a vertical section on line 3 3 of Fig. 2 with, however, both filtering-diaphragms in place. Fig. 4 is a perspective view of a series of filter-cells mounted in a tank, the latter being broken away; and Fig. 5 is a sectional detail showing the manner of mounting the cell on a perforated plate or board.

One object of my invention is to construct a filtering-cell the chamber of which (or that from which the filtered water is discharged) shall be reduced to minimum dimensions as compared with the size of the porous diaphragms by which said chamber is bounded, whereby the specific gravity of the cell shall be such as to insure positive sinking or submergence thereof when placed in water.

A further object is to construct a cell in which the porous diaphragms constituting the filtering material shall be fully protected in the handling thereof against knocks, impacts, and the like.

In detail the filtering-cell may be described as follows:

Referring to the drawings, 1 represents a (preferably) metallic band or frame cast as a single piece and which may be either circular, as shown, or polygonal, and axially of a dimension reduced beyond the point where the term "tube" or "cylinder" is applicable thereto. By a reduction in length of the axis of the band, as herein indicated, the effect will be to reduce to a minimum the distance between the opposite faces or ends of the completed cell formed by the porous diaphragms held within the band. The latter is provided along its inner surface with a circular rib or ledge 2, the thickness of which determines the distance by which the porous diaphragms 3 are held separated from one another, and hence determines the height of the chamber 4 of the cell thus formed between the diaphragms. The diaphragms 3 rest against the opposite faces of the rib and are fully protected by the band, being flush with the opposite ends thereof and secured to the inner surface of the band by a layer of cement 5 interposed between said surface and the outer edges of the diaphragms 3, the latter being made of tripoli or equivalent filtering material. The rib 2 is cut away or removed at any convenient point 6 of the compass thereof, the outer peripheral wall of the band being provided at a point opposite said cut-away portion of the rib with a nipple 7, having formed therein two intersecting passages 8 and 9, respectively, the former penetrating the band at a point opposite the cut-away portion of the rib and extending radially entirely through the nipple, the latter passage 9 extending at right angles to the first passage or in a line parallel to the axis of the band or cell. The outer end of the passage 8 is closed by a rubber or other suitable plug 10, which when removed enables the chamber 4 to be cleaned by a wire or by the introduction of a suitable quantity of sand. The passage 9 may be provided with a flexible siphon-tube 11, the filtering-cell being first submerged with the open end of the passage 9 pointing upward, as seen in Fig. 1, whereby the tube leading therefrom is in no danger of being collapsed at its point of juncture with the nipple, and the filtered water entering the chamber 4 through the diaphragms can be siphoned off, as is obvious. In some cases, as seen in Fig. 4, I may arrange a battery of cells within the upper compartment of a tank 15, the nipples 7′ under these circumstances being provided with but a single passage through which the filtered water may drip into the lower compartment of such tank. The cells are set vertically a few inches apart, the partition plate or floor 16, on which the cells are supported, being provided with holes for the snug support of the nipples 7′ of the respective cells.

In such cases I may readily introduce a brush or swab from above and thoroughly clean the outer surfaces of the diaphragms without disturbing the cells.

By reducing the axis of the cell as heretofore described it reduces the resulting cell into the form of a disk, (circular or polygonal,) through the diaphragms of which the water filters equally, and hence there is no occasion to reverse the cell to cause the water to flow through it first in one direction and then the other, as must often be done in the case of tubular filters.

It is apparent, of course, that minor changes may enter into the construction of the cell without departing from the spirit of my invention.

Having described my invention, what I claim is—

1. A filter comprising a suitable closed band or frame having a rib or ledge disposed along the inner surface thereof, the whole being cast as a single piece, the rib having opposite plane surfaces for the support of suitable porous diaphragms, a perforated nozzle projecting from the periphery of the band and communicating with the space between the diaphragms, a perforated supporting plate or board adapted to receive said nozzle and hold the filter in an upright position, whereby the faces thereof are readily accessible for purposes of cleaning, substantially as set forth.

2. As an article of manufacture, a filter-cell comprising a closed band or frame cast in a single piece, and having a rib or ledge disposed along the inner surface thereof for the support of suitable porous diaphragms, a perforated nozzle projecting from the periphery of the band and communicating with the space between the diaphragms, the band being of such a dimension as to insure a specific gravity therefor to enable the cell to sink in water by its own weight, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES SHUMAN.

Witnesses:
EMIL STAREK,
GEO. L. BELFRY.