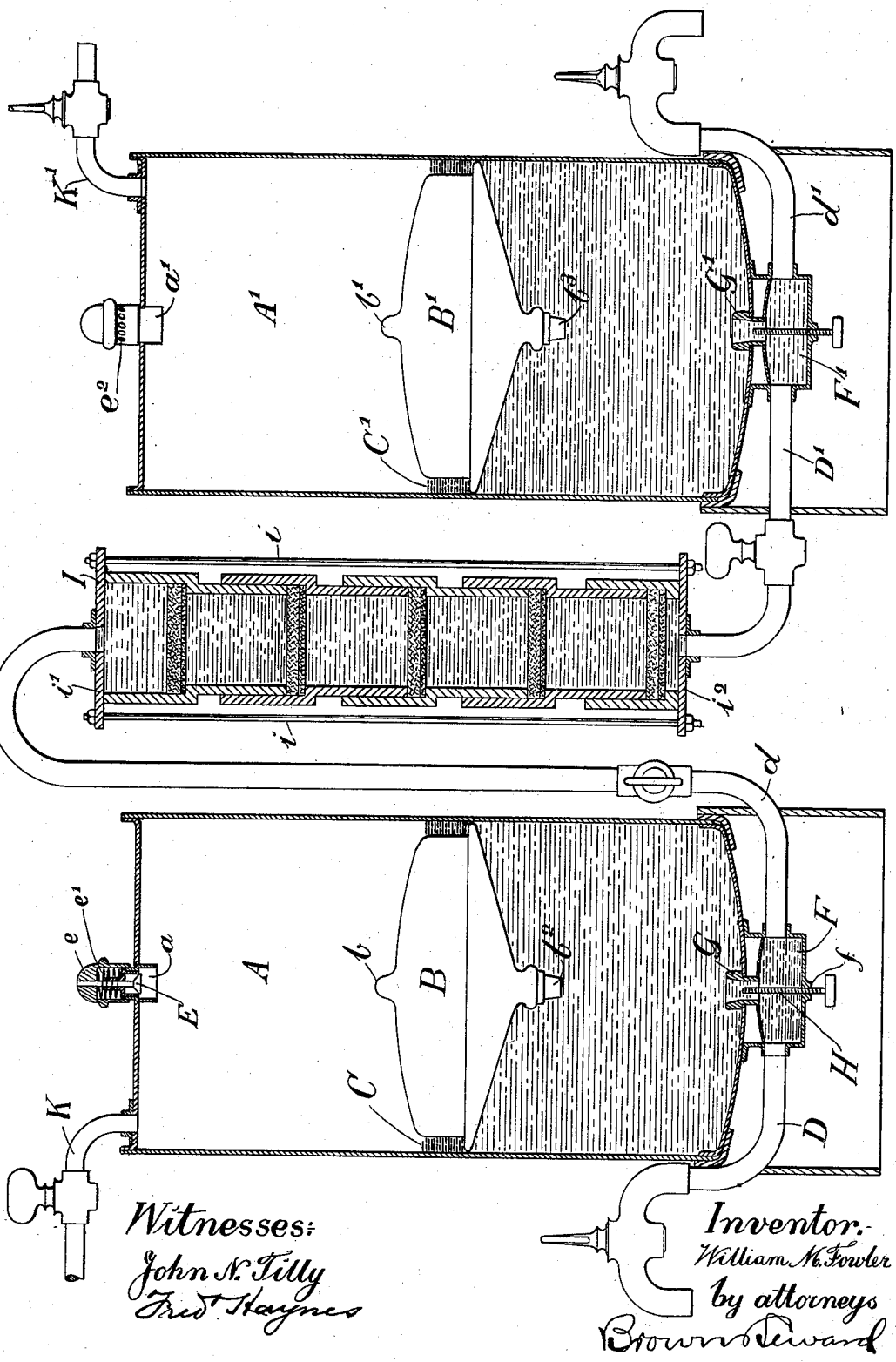
(No Model.)

W. M. FOWLER.

CLARIFYING LIQUIDS.

No. 565,973. Patented Aug. 18, 1896.



Witnesses:
John N. Tilly
Fred't Haynes

Inventor:
William M. Fowler
by attorneys
Brown & Seward

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UNITED STATES PATENT OFFICE.

WILLIAM MILES FOWLER, OF STAMFORD, CONNECTICUT.

CLARIFYING LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 565,973, dated August 18, 1896.

Application filed May 9, 1896. Serial No. 590,823. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MILES FOWLER, of Stamford, in the county of Fairfield and State of Connecticut, have invented a new and useful Improvement in Clarifying Liquids, of which the following is a specification.

My invention relates to an improvement in clarifying liquids in which provision is made for passing the liquid from one receptacle to another and through a filter intermediate of the two receptacles, without exposing the liquid to the air either in the receptacle from which it is drawn or that in which it is received after passing through the filter.

The accompanying drawing presents in vertical section a series of two receptacles and a filter interposed between them, although the number of vessels may be three or more, as may be found desirable.

The gist of my invention is the vessels provided with movable liquid-tight septums, free to rise and fall within the vessels to protect the liquid beneath the septum or seal from contact with the air, a connection through a filter between the portions of the vessels below the liquid-tight septums or seals and means for imparting the necessary pressures to cause the liquid to flow from one of the vessels through the filter to another vessel.

The vessels which I have shown to explain my invention are denoted by A and A'. They are each provided with a septum consisting of a liquid and a float, the float in the vessel A being denoted by B and that in the vessel A' by B'. The floats B B' are fitted to rise and fall freely within the vessels A A' and are surrounded by a body of sealing liquid, as, for example, oil, denoted by C and C'.

The tops of the floats B B' are provided with projections b b', adapted to enter sockets a a' at the tops of the tanks A A' and cut off the exit of air from within the tanks when, for any purpose, the tanks are being filled with liquid beneath the floats through the inlet-pipes D D'.

The sockets a a' are held normally closed against communication with the outside air by means of valves E, connected with vertically-movable caps e, which fit over the exterior and ends of the socket-pieces a a' and are held normally raised by means of springs e'. There are openings e^2 in the caps e, so that when they are depressed to lower the valves E from their seats there will be free communication between the interior of the tank and the exterior air; but when they are left free they will lift under the tension of the springs e' and hold the valves seated.

At the bottoms of the tanks A A', I find it convenient to provide chambers F F' for the reception of the liquid-seals C C' when the liquid has been withdrawn from the tanks, and the bottoms of the floats B B' are provided with projections b^2 b^3, which enter nipples G G' at the bottoms of the tanks as the floats B B' are lowered and hold the chambers F F', closed against communication with the interiors of the tanks to prevent the further discharge of liquid therefrom. The discharge-pipes d d' lead from the chambers F F', and hence, as soon as the projections b^2 b^3 become seated in the nipples G G' by the lowering of the floats, the discharge of liquid from the tanks will be stopped, no matter what the pressure exerted upon the floats may be.

For convenience in shipping, where the tanks are made portable, I provide a screw H, which engages a screw-threaded perforation f in the bottom of the chamber F or F' and extends up within the nipple G in position to engage the perforation b^2, and hence lock the float in its depressed position.

The exit-pipe d from the chamber F enters the top of the filter I, and the inlet-pipe D' for the tank A' connects with the bottom of the filter I.

The filter I may be of any suitable structure, that herein shown being of the general nature shown, described, and claimed in my pending application, Serial No. 557,324, filed July 27, 1895, and composed of a plurality of superposed telescoping sections having filtering material interposed between the end of one section and an annular shoulder on the section within which it enters, the several sections of the filter being made interchangeable by simply loosening the tie-rods i, which connect the plates i' and i^2, located, respectively, at the top and bottom of the collar.

A pipe K for the inlet of compressed air connects with the top of the tank A, and a similar pipe K' connects with the top of the tank A' for the purpose of using the tanks in

reverse order, if desired, or for the purpose of forcing the float B′ downwardly to force steam admitted to the exit-pipe *d′* through the filter in reverse order for cleaning purposes, if desired.

The several pipes are provided with stop-cocks, located for convenience in forming the necessary closures and openings for rendering the apparatus operative.

In use suppose the tank A to have been charged with liquid which it is desired to clarify and the inlet-pipe D closed, the exit-pipe *d*, leading to the top of the filter, being open, the inlet-pipe D′, leading to the tank A′, being open, and the air-vent at the top of the tank A′ being open and exit-pipe *d′* closed. If pressure be admitted to the tank A through the pipe K above the float B, it will force the liquid in the tank A through the filter and into the tank A′ beneath the float B′. If the filter and tank A′ be located sufficiently below the tank A to produce the necessary head, gravity may be utilized instead of pressure admitted through the pipe K. In thus passing the liquid from the tank A through the filter into the tank A′ it is not exposed to the atmosphere, either in the tank from which it is discharged or in the tank into which it is received; nor is it exposed to the atmosphere while passing through the filter. Its aroma is therefore completely saved, and it may be drawn from the tank A′ for purposes of barreling, bottling, or other use, as may be desired.

What I claim is—

1. Apparatus for clarifying liquids, comprising a plurality of tanks each provided with a movable liquid-tight septum and a filter connected with the said tanks at points below the liquid-tight septums, substantially as set forth.

2. Apparatus for clarifying liquids, comprising a plurality of tanks each provided with a movable liquid-tight septum, a filter connected with the tanks at points below the liquid-tight septums, an inlet connected with one of the tanks at a point below its septum and an outlet connected with another of the tanks below its septum and means for applying pressure upon the septum in one or more of the tanks to force the liquid therefrom, substantially as set forth.

WILLIAM MILES FOWLER.

Witnesses:

FREDK. HAYNES,

ROBT. B. SEWARD.