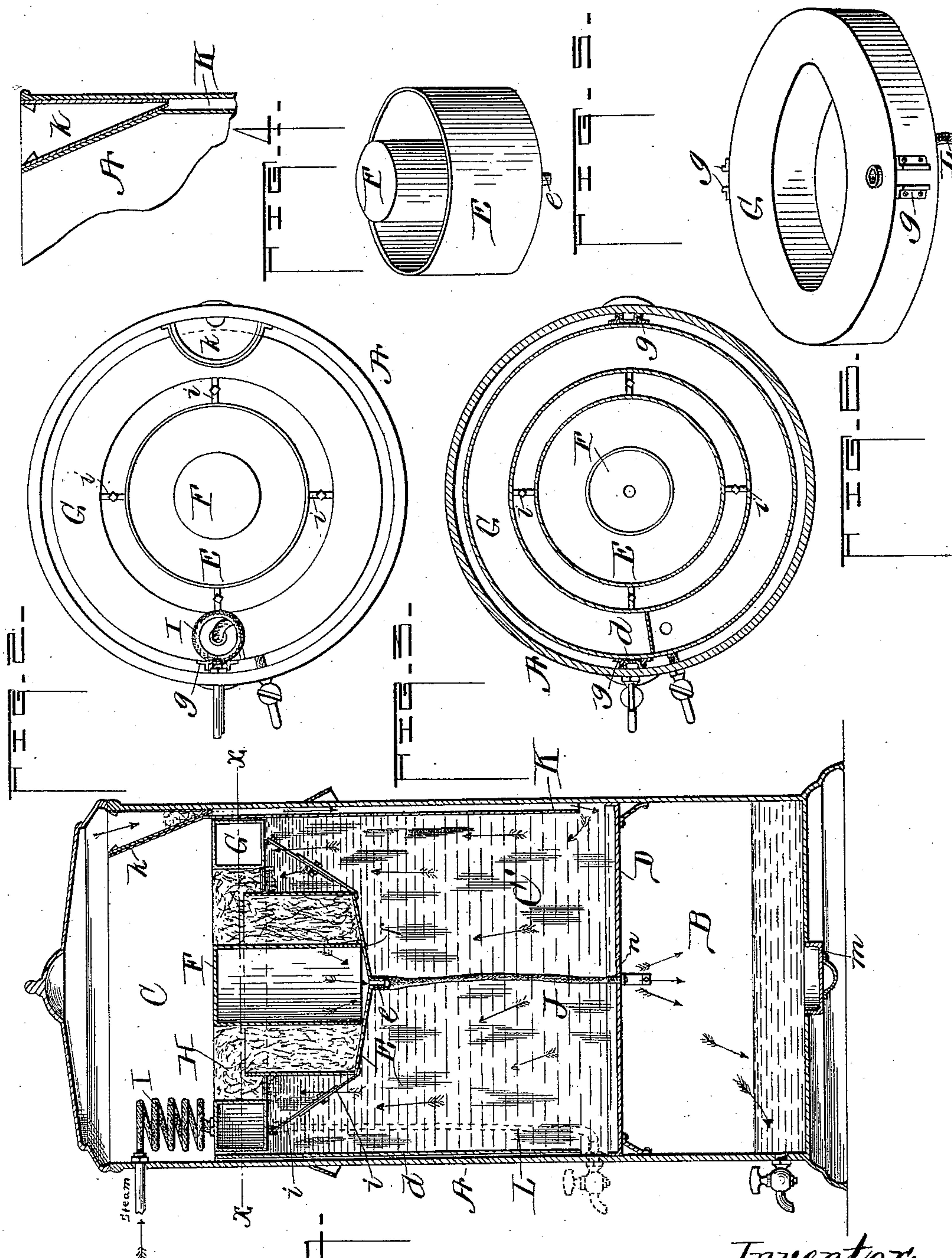


(No Model.)

J. M. WELLS.  
FILTER.

No. 563,523.

Patented July 7, 1896.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

JAMES M. WELLS, OF PEORIA, ILLINOIS.

## FILTER.

SPECIFICATION forming part of Letters Patent No. 563,523, dated July 7, 1896.

Application filed April 25, 1895. Serial No. 547,194. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES M. WELLS, a citizen of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Filters; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in filters, by means of which a very efficient device is provided for that purpose.

More particularly my invention relates to a filter adapted in its construction to practically apply the principles of capillary attraction in performing its filtering function.

My invention consists, essentially, of the provision, in connection with a reservoir or tank divided into compartments, of a floating case constructed to contain absorbent material and to provide for sufficient buoyancy to enable the same to float upon the liquid in the reservoir, of a suitable duct leading from said case, of a hollow ring connected with said case, of a steam-coil, and of other details of construction hereinafter more particularly enumerated.

That my invention may be more fully understood, reference is had to the accompanying drawings, in which—

Figure 1 is a vertical section through my filtering device. Fig. 2 is a plan view of the same when the lid is removed. Fig. 3 is a section through line *x x* of Fig. 1. Fig. 4 is a detailed view showing the inlet-duct. Fig. 5 is a detailed view showing the construction of the inner case of the float. Fig. 6 is a detailed view showing the outside ring of the floating case.

In the figures, A refers generally to the main tank or reservoir, which is divided into the compartments B and C by the partition D, the said reservoir being provided with a suitable lid, as shown in the drawings.

E is a circular case open at the top and provided with the outlet-tube *e* at the bottom portion thereof.

F is a cylinder closed at the top, and is provided with the perforation *f* around the cir-

cumference of its lower portion, as shown in Fig. 1.

G is a circular ring rectangular in cross-section, and is adapted to bear around the case E a short distance therefrom.

H is an absorbent material, as cotton or like substance, having a capillary consistency, which absorbent material is packed within the case E in such a manner as to occupy the space between the cylinder F and the wall of said case E, and is also caused to bear over the edge of case E and down a short distance on the outside thereof, and up against the inner case of ring G, thus providing a siphon-formed body of absorbent material.

*i i* are metal strips, one end of each being connected, respectively, with the case E, and the ring G and the two strips being connected at intermediate points where they overlap and are secured together by means of a suitable bolt or other securing device, so as to provide for a shifting of the strips with relation to each other to cause a longer or shorter reach, as may be desired.

L is a flexible tube connected with the tube *e* of case E at one extremity and connected with the tube *n*, projecting upwardly from the opening in the partition D, which divides the reservoir into compartments, as shown in Fig. 1.

K is an inlet-duct, open at both top and bottom, the lower portion thereof extending almost to the bottom of compartment C, the upper portion of the inlet-duct flaring outwardly, and is provided with a perforated strainer *k* to catch the coarser deposits in the liquid.

L is a flexible tube (shown in the dotted lines in Fig. 1) connected with the hollow ring G at one end and opening out of the case through a suitable faucet provided and is useful to drain off any accumulations of water resulting from condensation of steam as it passes through the hollow ring G.

*m* is an opening in the bottom of the tank and opening out of the lower compartment therein and is provided with a suitable cap or cover for closing said opening.

*d* is a vertical guide-rib on the side of the compartment C.

*g g* are clips on the side of ring G, which



match with the guide *d*, and the duct K, which serves as one of the guides, as shown in the drawings.

In constructing my filter, I have sought to overcome many objections that are legitimately chargeable against filters now in use and relating particularly to complications in constructions and inefficiency in operation. In my filter I obtain the very essence of simplicity, inasmuch as I simply use the ordinary tank and divide it into two parts, forming an upper and lower compartment, and in the upper compartment simply provide a float carrying absorbent material in such relation to the surface of the liquid contained in the upper compartment, through the said absorbent material and case and through a suitable conducting-pipe and into the lower compartment of the tank, into which it will be deposited in a perfectly pure condition, the absorbent material having separated all the foreign matter of every kind and character from the liquid.

In applying my filter for practical uses, the several parts thereof having been arranged within the main compartment substantially in the manner shown in the drawings, the liquid is poured through the strainer *k* and passes down through the duct K and into the lower part of compartment C, and any foreign matter that has not already been caught by the strainer will be deposited in the lower portion of said compartment, the clearer and purer portions of the liquid occupying the space above. The case, as shown in the drawings, filled with the absorbent material, is caused to float upon the surface of the liquid, as shown in Fig. 1, and the liquid will be conducted, as shown by the arrows, through the absorbent material into the case E, from thence through the perforations into the cylinder F, and from thence through the tube J into the compartment B. When the weather is such as to cause any liquid being filtered, as oil, to become thick, which would have a tendency to retard the capillary action of the filter, steam may be injected through coil I into the ring J, which will warm the body of the oil and render the same susceptible to capillary action, and any accumulations of water, resulting from condensation of steam, passing through the hollow ring J may readily be drawn off through the flexible tube L.

I do not desire to confine myself to the exact construction of float shown in the accompanying drawings, nor to the exact arrangements of the parts which I have shown, but desire that I may be enabled to modify the construction, following, of course, substantially the lines laid down and suggested in this application.

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

1. In a filter the combination with a receptacle for containing liquid of a buoy or float

consisting of a pan, provided with a duct leading therefrom to a separate receptacle, a capillary-acting absorbent material carried within said pan and bearing over the edge thereof, and a hollow ring carried around the pan and bearing against the absorbent material, for assisting in maintaining the said pan upon the surface of the liquid, all substantially as described and shown.

2. In a filter the combination with a pan carried within the liquid-receptacle thereof and provided with a suitable duct leading therefrom to a suitable receptacle or a separate compartment, and filled with capillary-acting absorbent material, the same being caused to overlap and extend down over the outside of said pan, of a hollow ring to which the said pan is connected and is supported thereby in such a manner as to cause the same to float upon the surface of the liquid and a tube connecting the hollow ring with a steam-inlet pipe into the liquid-receptacle, all substantially as described and shown.

3. In a filter the combination with a filter-case divided into two separate compartments, one above the other, of a buoy or float consisting of a pan submerged in the liquid in the upper compartment of said case and provided with a suitable duct leading therefrom to the lower compartment, a capillary-acting absorbent material or materials filled within the said pan, overlapping the upper edges and extending down upon the outside thereof, so as to be immersed in the liquid within which the pan is submerged and a suitable air-chamber supported in connection with said pan to facilitate the floating of the same, whereby the capillary-acting absorbent will conduct the liquid from points without the pan through the absorbent material into the pan, from which it will flow through the duct provided in the receptacle below, all substantially as described and shown.

4. In a filter, the combination with the main filter-case A, divided into two compartments, B and C, of a buoy or float carried upon the surface of a liquid contained in compartment C, consisting of the pan E, the capillary absorbent material H carried within said pan and bearing over the edge thereof and the open ring G, bearing around the pan and supported and suitably connected therewith, and the duct J connecting the pan E with the compartment B whereby the pan will be caused to float upon the surface of the liquid and the capillary-acting absorbent bearing without the pan will be immersed in the liquid within the compartment C and by capillary action the liquid will be conducted into the pan and from thence through duct J, into compartment B below, all substantially as described and shown.

5. In a filter, the combination with the pan E, provided with the outlet-tube *e* therefrom leading through tube J to a separate receptacle, and the perforated partition F therein for



5 containing an absorbent material, designed to fill the space between the side of the pan and the partition and lap over the edge of the pan and extend down on the outside some distance, and the hollow ring G connected with said pan by means of strips *i, i*, provided with the flexible tube I, opening into the hollow ring and connected with a steam-inlet pipe

opening into the filter-case, all substantially as described and shown. 10

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

JAMES M. WELLS.

Witnesses:

W. V. TEFFT,

N. A. WOODSON.