

No. 671,003.

Patented Apr. 2, 1901.

M. RUTHENBURG.
FILTER.

(Application filed Apr. 3, 1900.)

(No Model.)

FIG. 1.

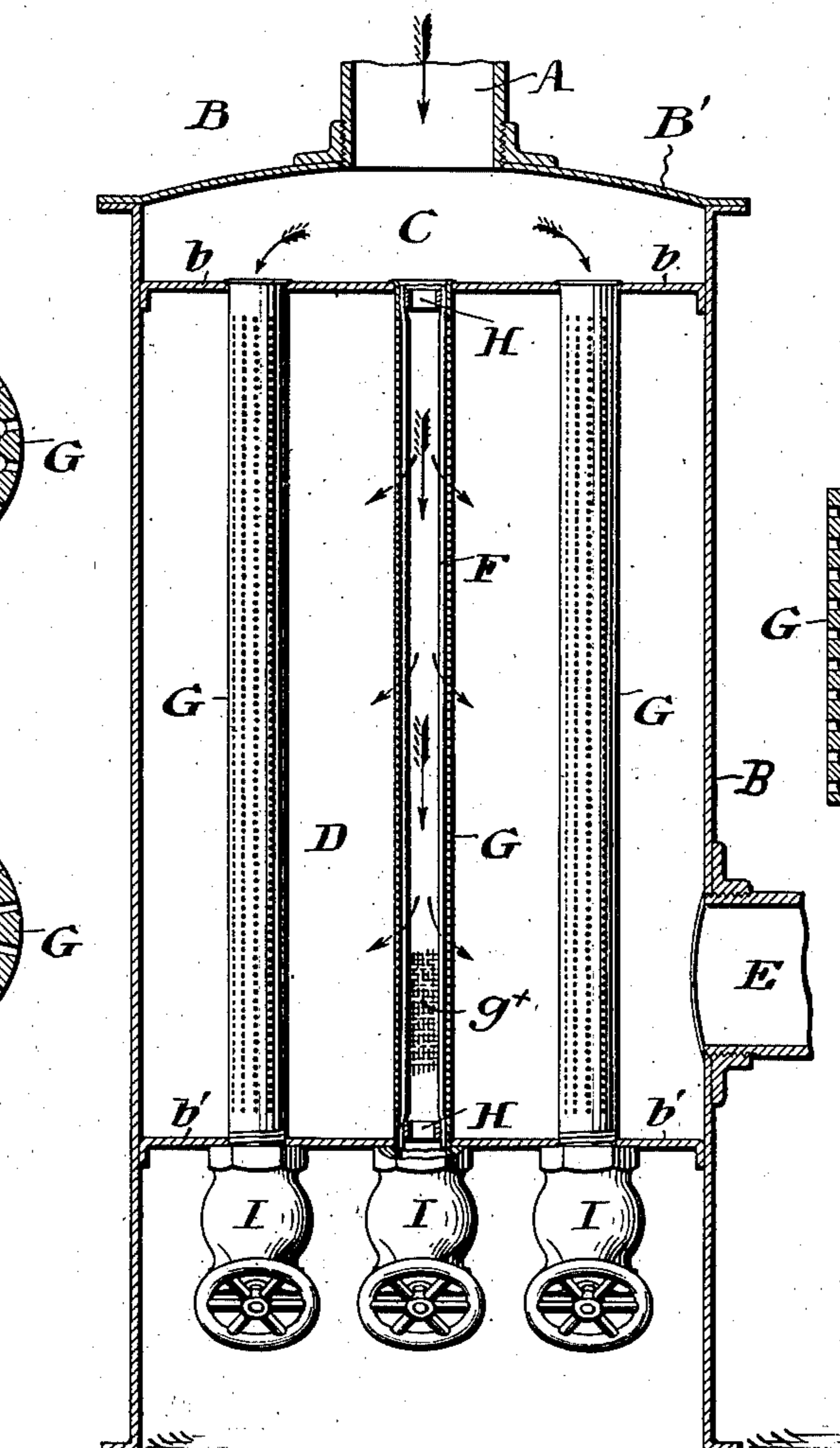


FIG. 2.

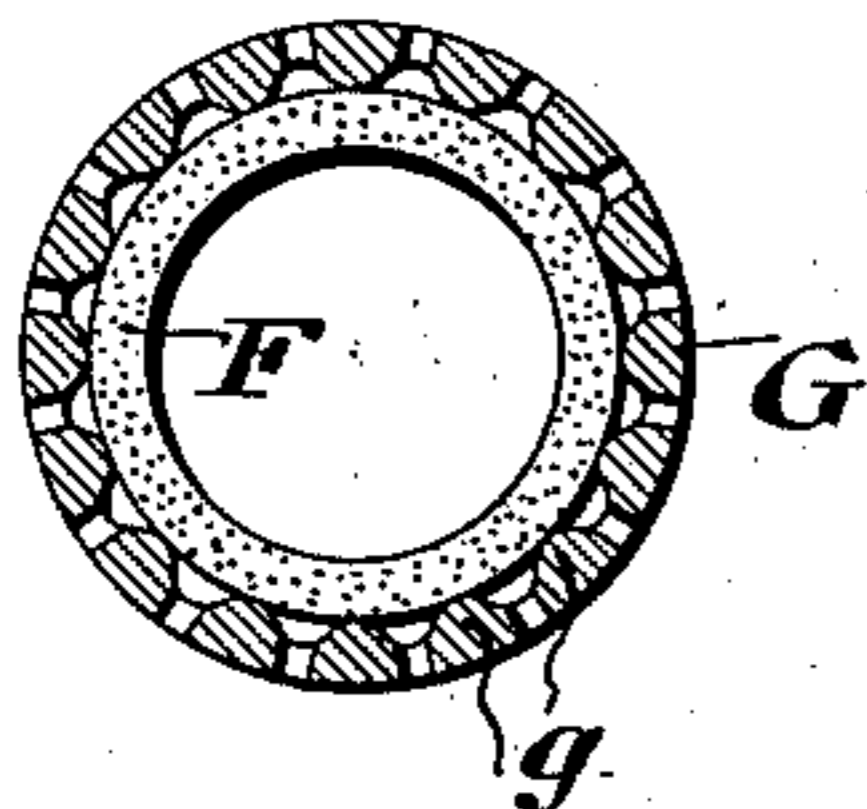


FIG. 3.

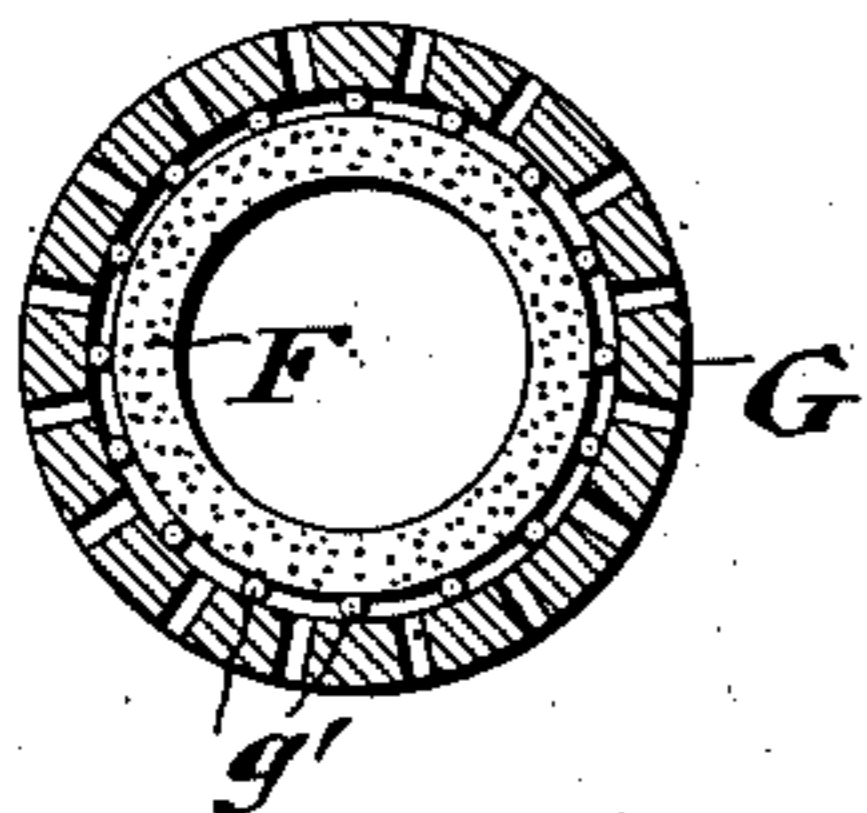
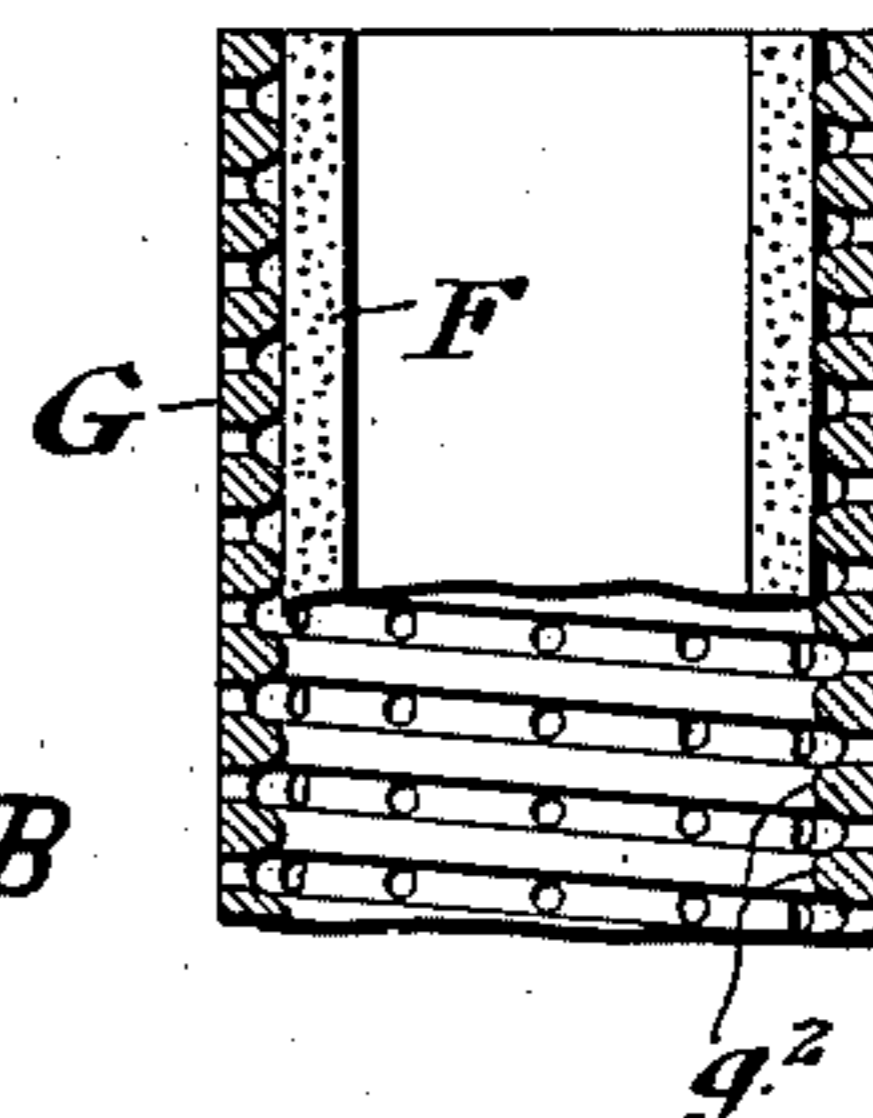


FIG. 4.



WITNESSES:

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MARCUS RUTHENBURG, OF PHILADELPHIA, PENNSYLVANIA.

FILTER.

SPECIFICATION forming part of Letters Patent No. 671,003, dated April 2, 1901.

Application filed April 3, 1900. Serial No. 11,278. (No model.)

To all whom it may concern:

Be it known that I, MARCUS RUTHENBURG, of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Filters, whereof the following is a specification, reference being had to the accompanying drawings.

My invention relates to filters of the class wherein a textile fabric is comprised as a filtering medium.

It is the object of my invention to provide a filter wherein the textile fabric is so arranged with respect to the other elements of the apparatus as to be readily cleansed without removal from its embodiment and which is so secured with respect to the latter that it may be conveniently removed and renewed.

My invention consists of a filtering-tube of flexible textile material secured within a rigid tube which is permeable with respect to the filtrate and arranged to support the flexible textile tube in combination with means to separate the inner textile tube from the outer supporting-tube and means to normally maintain said inner and outer tubes in fixed relation, as hereinafter more definitely specified.

In the accompanying drawings, Figure 1 is a vertical sectional view showing a convenient embodiment of my invention. Figs. 2 and 3 are cross-sectional views through the single unitary filter members, showing modified means for maintaining the inner textile tube separate from the outer tube which supports it. Fig. 4 is a longitudinal sectional view through one of said unitary filter members, showing modified means for maintaining said tubes separate.

Referring to Fig. 1, A is the inlet-pipe, connecting with the outer shell or casing B, which incloses the chamber C for the raw or unfiltered liquid, and the chamber D for the filtrate. E is the outlet for the filtrate from said chamber D. Within said casing B, I have shown three tubular filter units, although it is to be understood that any convenient number thereof may be employed. Said units each comprise an inner textile tube F, secured in fixed relation with an outer permeable supporting-tube G by any convenient means, such as the expanded collars H. Said units may be secured within the casing B in any convenient manner, so that one extrem-

ity thereof is in communication with the raw-liquid chamber C, and the other extremity thereof communicates with the exterior of the casing B and is provided with suitable means, such as the valve I, to control the passage of liquid therethrough when it is desired to cleanse the inner surface of the textile tube F by the free passage of liquid from end to end thereof. However, I prefer to expand the upper ends of said tubes G within the head or diaphragm b, as in a tubular boiler, with the lower extremities of said tubes G in threaded connection with the lower head b' of the casing, the threaded extremities of said tubes G extending exterior to said casing being in threaded engagement with the valves I, which normally close the lower ends of said tubes.

The operation of the device is as follows: The raw liquid entered by the inlet A is distributed in the chamber C to the filtering units and within the latter is filtered through the textile tubes F and supporting-tubes G, as indicated by the arrows upon Fig. 1, and the filtrate thus discharged within the chamber D is outlet therefrom at E. The matter suspended in the raw liquid, which is separated therefrom by the textile tubes F, of course lodges within the latter and from time to time it is necessary to remove such accumulated matter, and thus cleanse said tubes. The cleansing operation is effected by opening any one or all of the valves I and permitting the raw liquid to rush through the respective tubes F, from end to end thereof, to thus remove and discharge the impurities lodged therein.

When it is desired to renew the tubes F, the cap B' and valves I may be removed, thus giving access to both ends of the tubes G, and the collars H being removed the tubes F may be renewed and the collars H replaced.

I find it is essential to the successful operation of the flexible textile tube within the rigid supporting-tube that means be provided to separate the outer surface of the textile tube F from the inner surface of the rigid supporting-tube G, for if said two surfaces are in intimate contact the filtering action is reduced to the minimum. The necessary separation of the tube F and the tube G may be secured in any convenient manner. However, in the

form shown in Fig. 2 the separating means consists of longitudinal ridges or ribs g , projecting from the inner surface of the tube G in integral relation therewith. Referring to
 5 Fig. 3, the separating means consists of wires g' , which may be singly disposed between the tube F and the tube G or be interwoven to form reticulated openings, as indicated at g^x
 10 in Fig. 1. Referring to Fig. 4, g^2 indicates ridges which extend spirally within the tube G , between the latter and the tube F . Said ridges may be in integral relation with said tube G , as shown in said figure, or may be separate therefrom in the form of a wire. •
 15 In view of the state of this art it is to be understood that I do not desire to broadly claim the use of textile material as a filtering medium; nor do I desire to claim the mere combination of a textile tube with a rigid sup-
 20 porting-tube. I believe it to be new, however, to provide a filter having the essential elements hereinbefore described, and therefore do not desire to limit myself to the precise arrangement or details of construction
 25 thereof which I have specified.

I claim—

1. In a filter, the combination with a tube of textile material, of a permeable tube exterior to said textile tube, and arranged to
 30 support the latter, and means between said textile tube and said supporting-tube, arranged to separate the same, substantially as set forth.

2. In a filter, the combination with a tube
 35 of textile material, of a permeable tube exterior to said textile tube and arranged to support the latter, and a ridge or ridges between said textile tube and said supporting-

tube, arranged to separate the same, substantially as set forth. 40

3. In a filter, the combination with a tube of textile material, of a permeable tube exterior to said textile tube and arranged to support the latter, and a spiral ridge or ridges
 45 between said textile tube and said supporting-tube arranged to separate the same, substantially as set forth.

4. In a filter, the combination with a tube of textile material, of a permeable tube exterior to said textile tube, and arranged to
 50 support the latter, means between said textile tube and said supporting-tube arranged to separate the same, and removable means arranged to maintain said tubes in normally-
 55 fixed relation, substantially as set forth.

5. In a filter, the combination with a casing B , of a chamber C , and a chamber D , within said casing, a tube G , communicating with said chamber C , and extending exterior to
 60 said casing B , and a valve I , to normally close the exterior end of said tube, substantially as set forth.

6. In a filter, the combination with a textile tube F , of a supporting-tube G , removable collars H , at the opposite extremities of said tube
 65 F , arranged to maintain said tubes in normally-fixed relation, and means to direct the flow of wash liquid through said tube F , and through both of said collars H , to remove and
 70 discharge the impurities lodged therein, substantially as set forth.

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Witnesses:

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