

(No Model.)

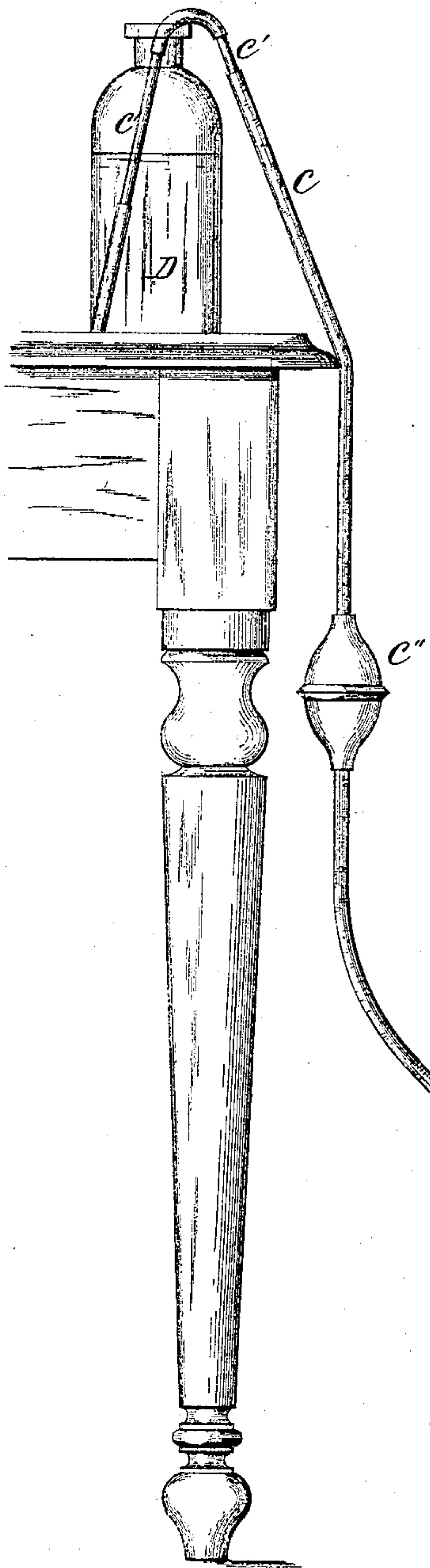
V. M. LAW.

FILTER.

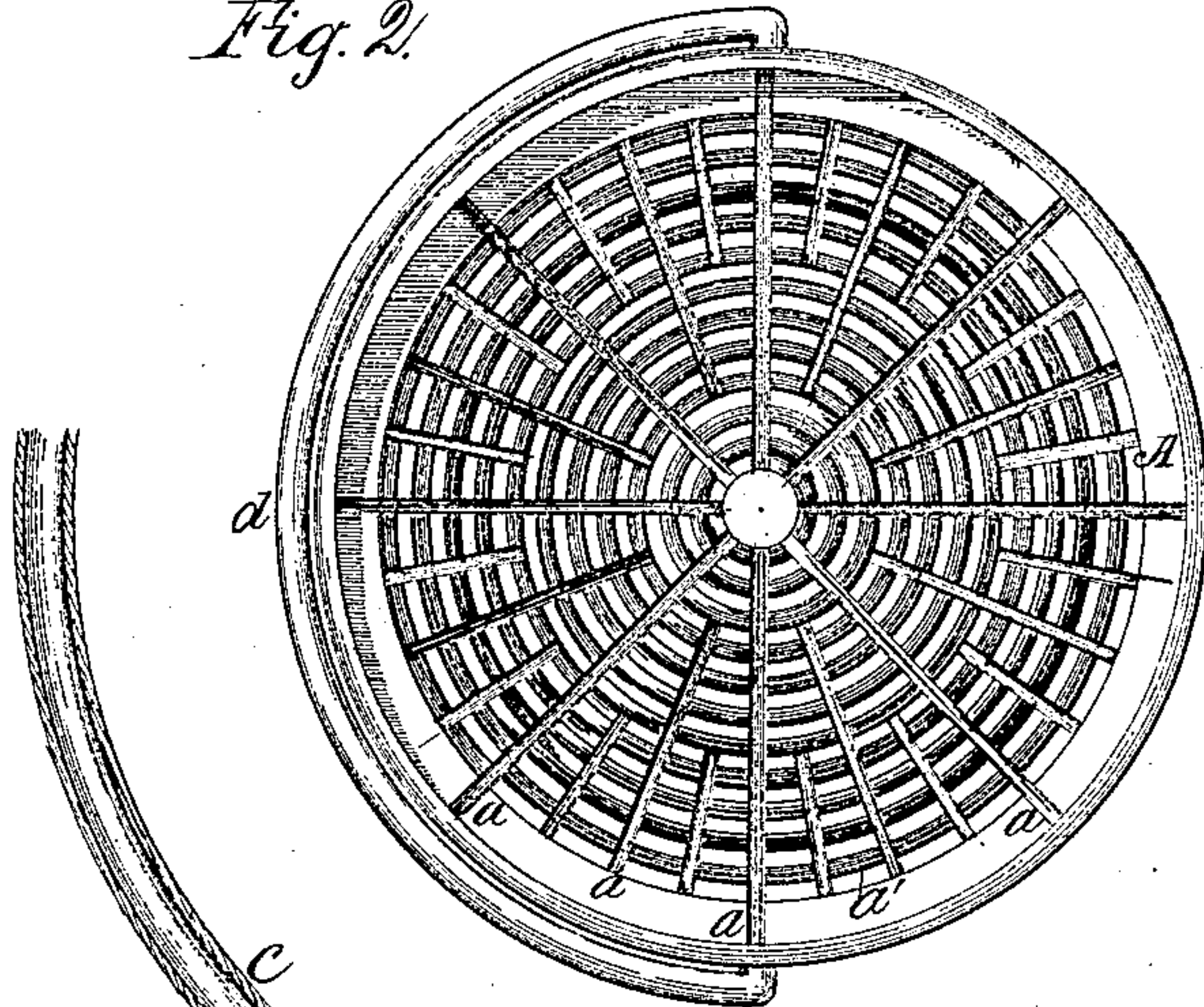
No. 321,228.

Patented June 30, 1885.

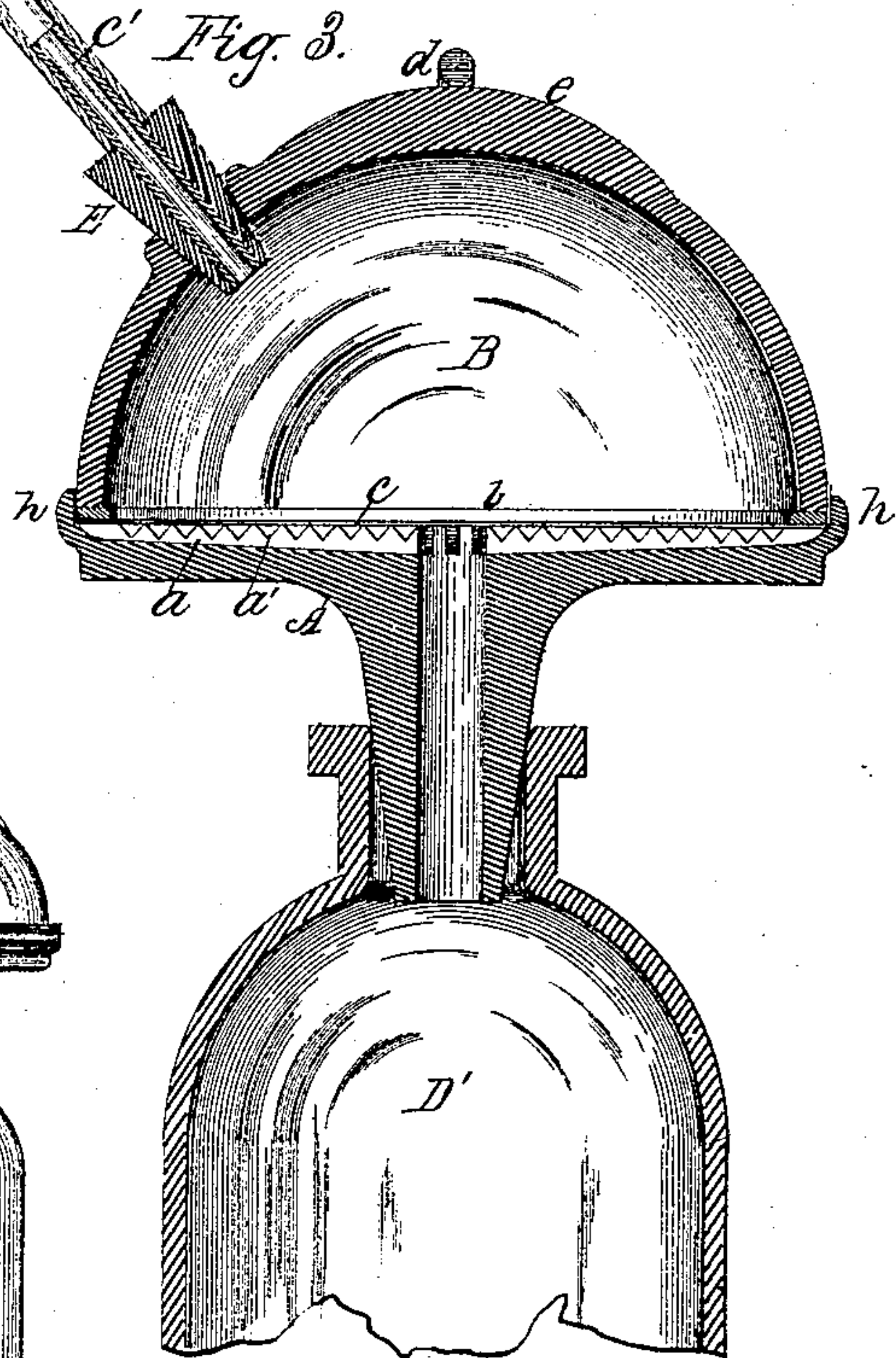
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



*Witnesses*

*L. J. Wilcox  
James Wilcox*

*Inventor.*

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His Atty.*



# UNITED STATES PATENT OFFICE.

VICTOR M. LAW, OF CEDAR RAPIDS, IOWA.

## FILTER.

SPECIFICATION forming part of Letters Patent No. 321,228, dated June 30, 1885.

Application filed December 8, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, VICTOR M. LAW, a citizen of the United States, residing at Cedar Rapids, in the county of Linn and State of Iowa, have invented certain new and useful Improvements in Filters, of which the following is a specification.

The object of my invention is to render the filtering of liquids more speedy, effectual, and economical than by the apparatus and processes in general use.

The invention consists in the application of a siphon for the purpose of conveying the liquid from the vessel containing it to the filter, in improved means for regulating the length of the siphon-tube and for connecting the same with the filter, in a novel construction of the base of the filter, which supports the filter-paper, and in simple means for hermetically securing the top of the filter to the base, all of which will be hereinafter more specifically described.

In the accompanying drawings, forming a part of this specification, Figure 1 represents an elevation of the invention as in use; Fig. 2, a plan view of the filter-base, and Fig. 3 a vertical half-section of the filter and a portion of the siphon-tube and the lower vessel.

Similar letters of reference indicate corresponding parts.

The filter, consisting in a base, A, adapted to support a flat disk of filtering-paper, c, and the top or cover B, adapted to be hermetically secured to the base, having been the subject of a former application for Letters Patent, need not be particularly described, except as to certain improvements made since the filing of my said former application. These improvements relate to the construction of the base and the manner of fastening the cover thereto. As originally constructed, the filtering-paper was supported on a disk of perforated metal forming a diaphragm across the filter; but in order to avoid the possibility of bad results from the contact of metal with liquids, particularly acids, as well as to save the expense of such disk altogether, I now so construct the base that it may support the paper and allow the free passage of water throughout it. To this end the upper side of said base is made flat and provided with channels or corruga-

tions, to allow the liquid passing through the paper to flow to the central hole and escape into the vessel below.

In Fig. 2 the channels *aa* are radial, a number extending from the central hole to the annular packing-seat next to the rim, and others running in from said packing-seat a shorter distance. These channels are intersected by a series of annular grooves, *a' a'*, whereby the liquid is permitted to pass through the paper c, resting upon their upper angles, and flow to the channels leading to the center. These channels are preferably inclined toward the center, as represented in Fig. 3. In practice I have found that it is desirable to have a few of them extend under the packing-ring *b*, as represented, there being less liability of leaking than if the packing-seat is left unbroken.

It will be evident that the grooves or channels may be arranged in a different order from that shown—as, for example, in angles or spirals—the only object being to support the paper, and allow the liquid to pass under it to the vessel below.

The filter is preferably made of glass so there is no danger of corrosion, and may be easily molded into the desired form.

The improvement in the manner of fastening the cover B to the base A consists in providing the crown of the cover with a rib, *e*, over which the bail *d* is strained, pressing the lower edge of the cover tightly against the packing-ring *b*. As an aid in resisting the strain of said bail, the base may be provided with a projecting rim, *h*, under which the bail is hooked in recesses formed for that purpose. The device, as will be seen, is simpler and more quickly operated than screws or like fastening means.

The general arrangement of the siphon will be readily seen. The object in using it is not simply to convey the liquid from one vessel to the filter communicating with another, but to utilize the weight of the descending column of liquid in forcing said liquid through the paper, and thus hasten the operation of filtering. By the use of a comparatively long tube I am able to filter sirups and like heavy liquids through paper, an operation not heretofore accomplished to my knowledge. The apparatus also admits of the vessels D D' being



placed on a table or shelf and on the floor, respectively, and the need of a retort-stand is dispensed with.

To adapt the siphon to necessary variations  
5 in the distance between the upper and lower vessels, the tube C may be made in sections and connected by means of short pieces of glass tube, as shown in Fig. 1, where the portion of the siphon inside the vessel is thus constructed and its length accurately adjusted to  
10 the height of the vessel. The turn in the siphon is preferably of glass tube, rubber or other soft tube being liable to kink and choke up, and may be protected from contact with  
15 the neck of the vessel by inclosing it in said rubber pipe. The siphon is supplied with a bulb, C'', by means of which the air is exhausted and the current started.

A simple coupling, E, admits of the tube  
20 being quickly and perfectly connected with the filter. The device consists in a rubber, cork, or like stopple with a central hole, in which is inserted a glass tube connecting it with the siphon-tube C, as shown in Fig. 3.

Thus constructed and arranged the filter is  
25 adapted to the purposes of the household, as well as laboratory, and is capable of performing its functions more rapidly than the ordinary apparatus, with equally good results, and  
30 with a large saving in paper.

I am aware that it is not new to construct filtering-vessels with grooved floors, and I do not claim such construction, broadly; but

I claim and desire to secure by Letters Patent—

1. A filtering-vessel having a grooved floor and a central opening, said grooves being of different depths, the deeper ones having inclined bottoms and connecting with the central openings, and the shallower ones having  
40 level bottoms and connecting with the deeper grooves, and a filtering material resting upon the said bottom above said grooves, substantially as and for the purpose set forth.

2. In a hermetically-sealed filtering-vessel,  
45 the combination, with a grooved base-plate having a downwardly-extending lug near its center and an upwardly-flanged rim, a perforation in said plate extending through said lug, of a series of deeper grooves leading into  
50 said perforation, a series of shallower grooves leading into said deeper grooves, a ring of elastic material around the inner edge of said plate, a disk of filtering material resting on said ring, a cover hermetically sealed there-  
55 on, and means, substantially as described, for leading the liquid to be filtered into said vessel, substantially as and for the purpose set forth.

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

VICTOR M. LAW.

Witnesses:

F. W. FLEMING,  
O. S. FELLOWS.