

(Model.)

3 Sheets—Sheet 1.

A. M. GRANGER.

FILTER.

No. 249,339.

Patented Nov. 8, 1881.

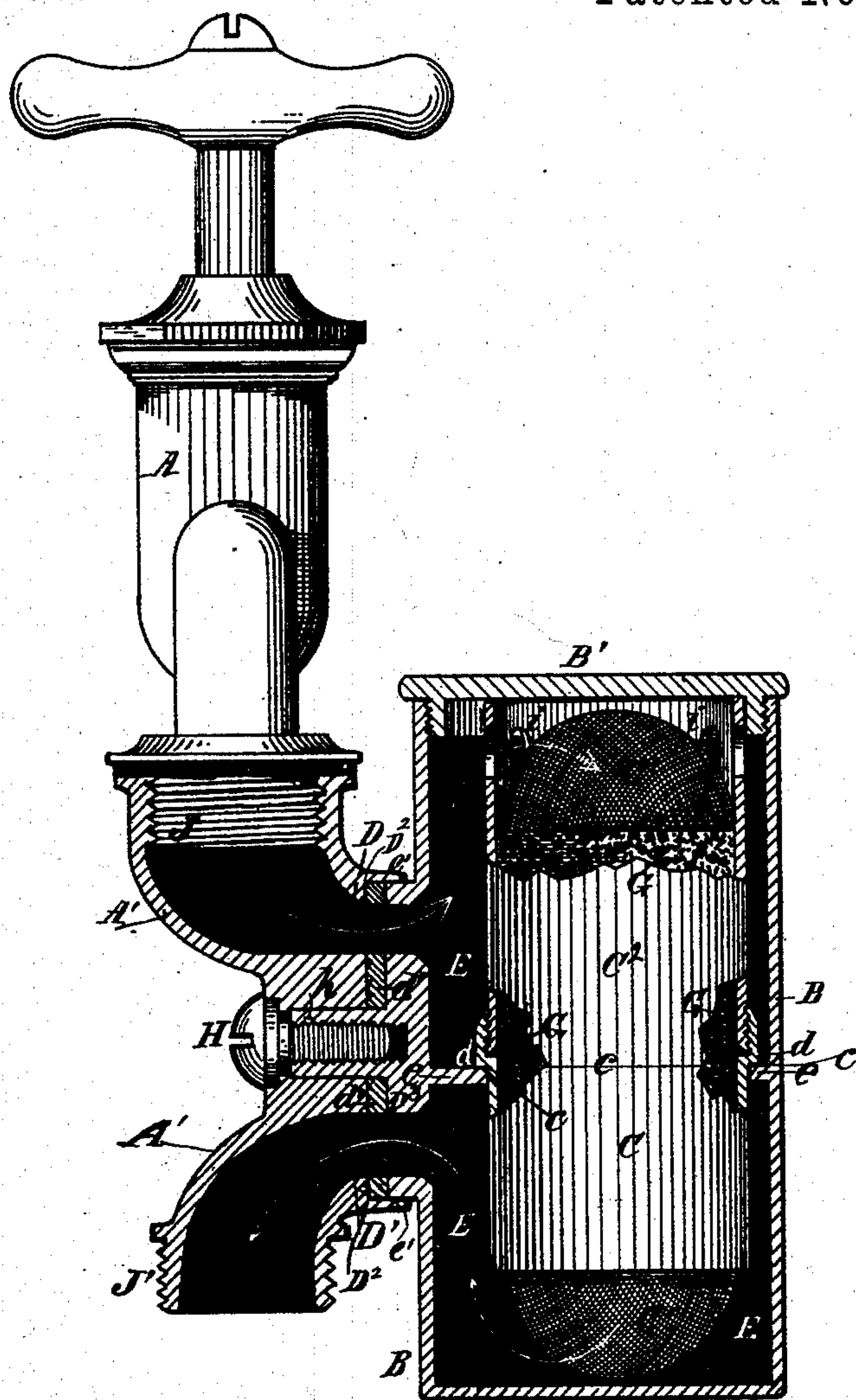


Fig. 1.

Witnesses.
J. W. Hays
Ed. Glatzmaier

Inventor:
Almon M. Granger
by his Attorney
Brown & Brown

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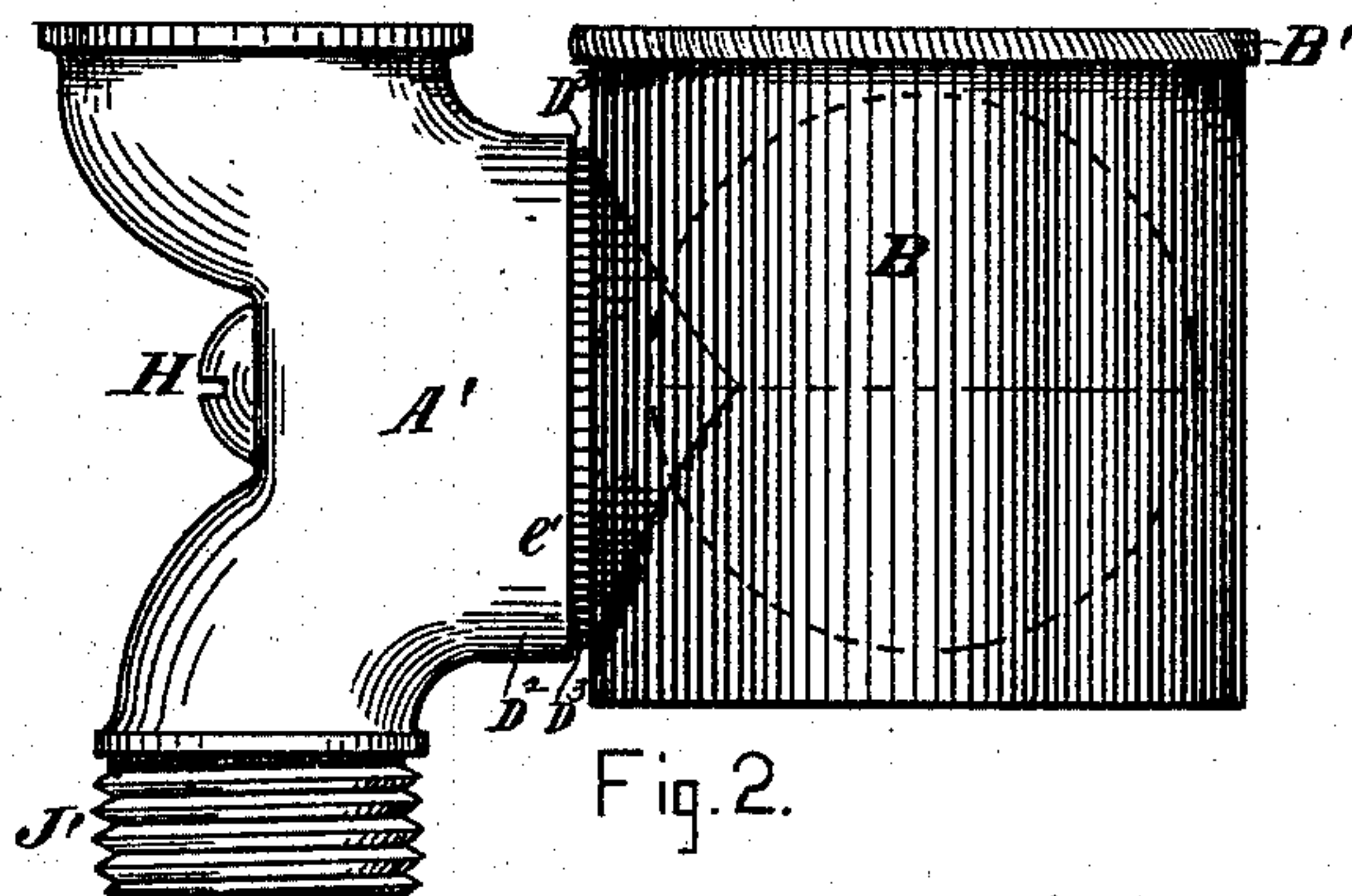


Fig. 2.

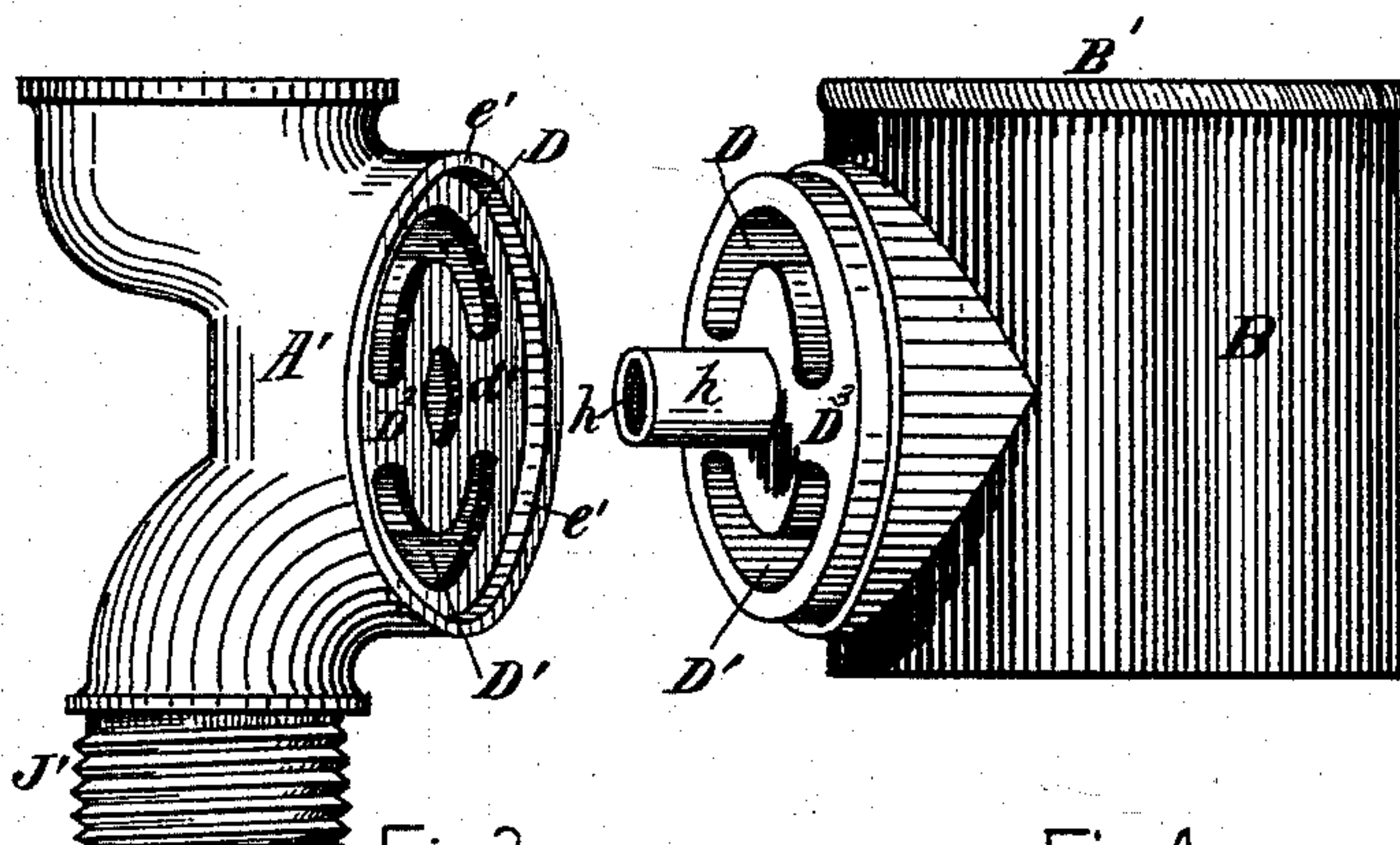


Fig. 3.

Fig. 4.

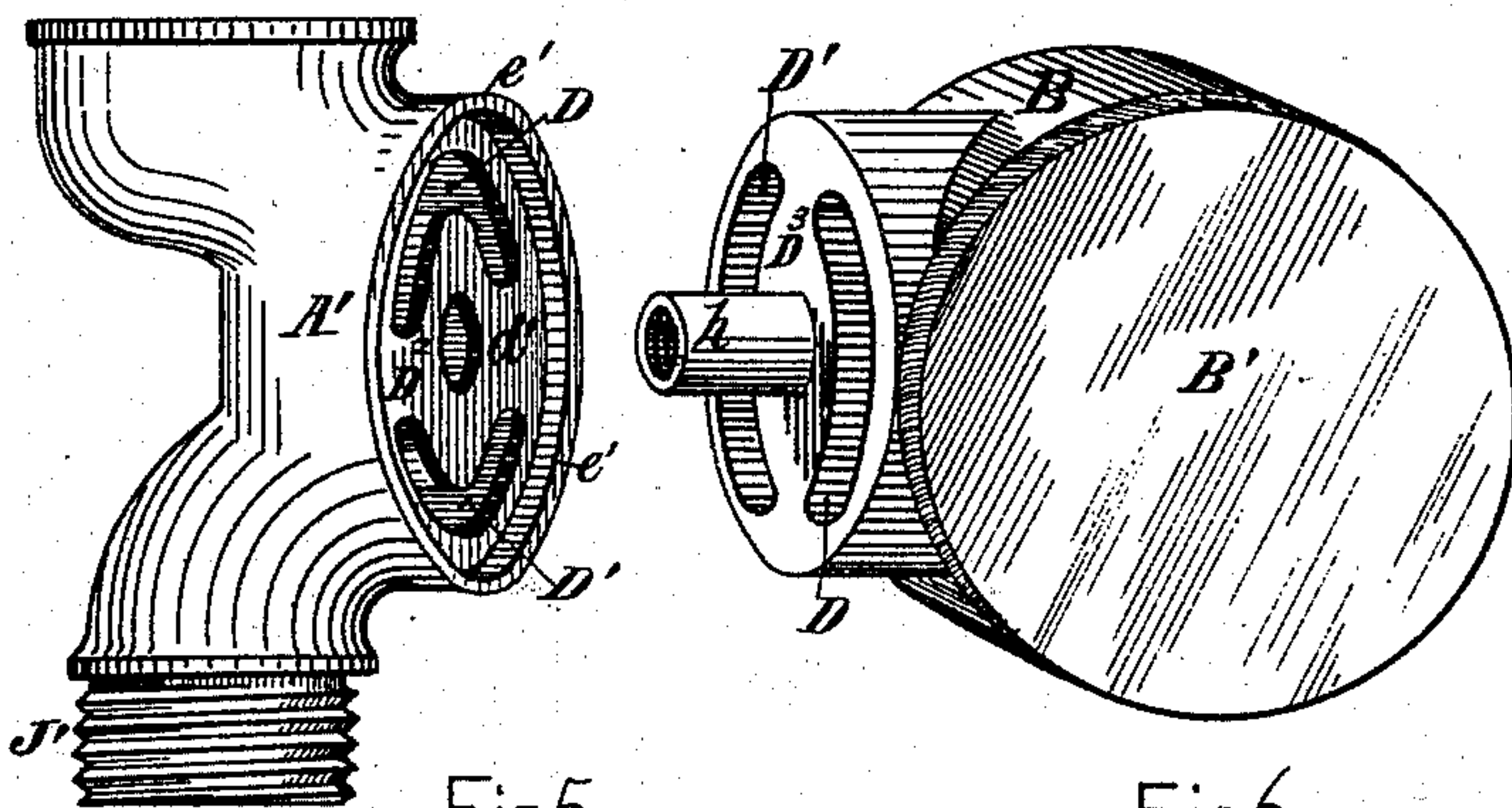


Fig. 5.

Fig. 6.

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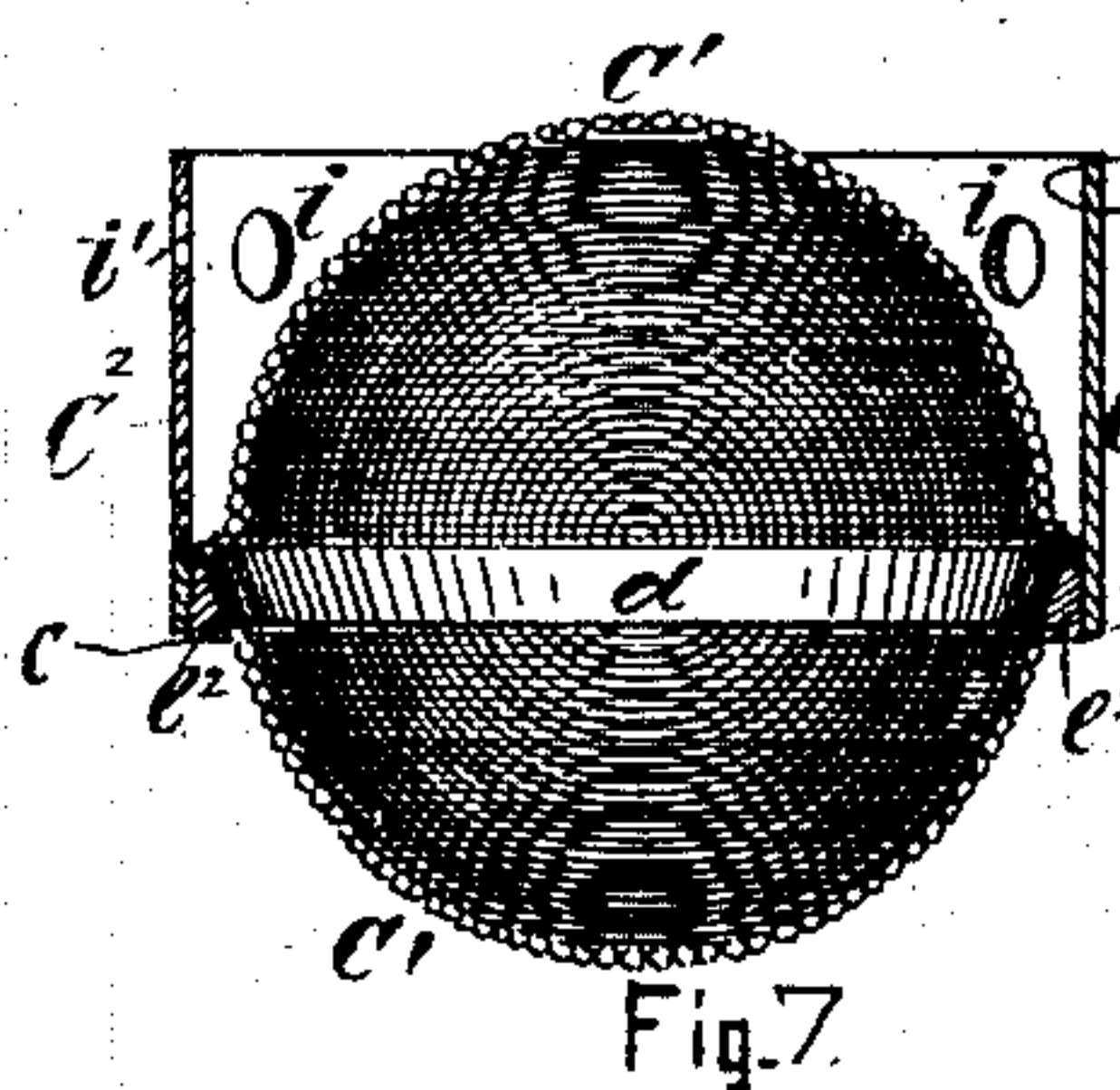


Fig. 7.

(Model.)

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Fig. 8.

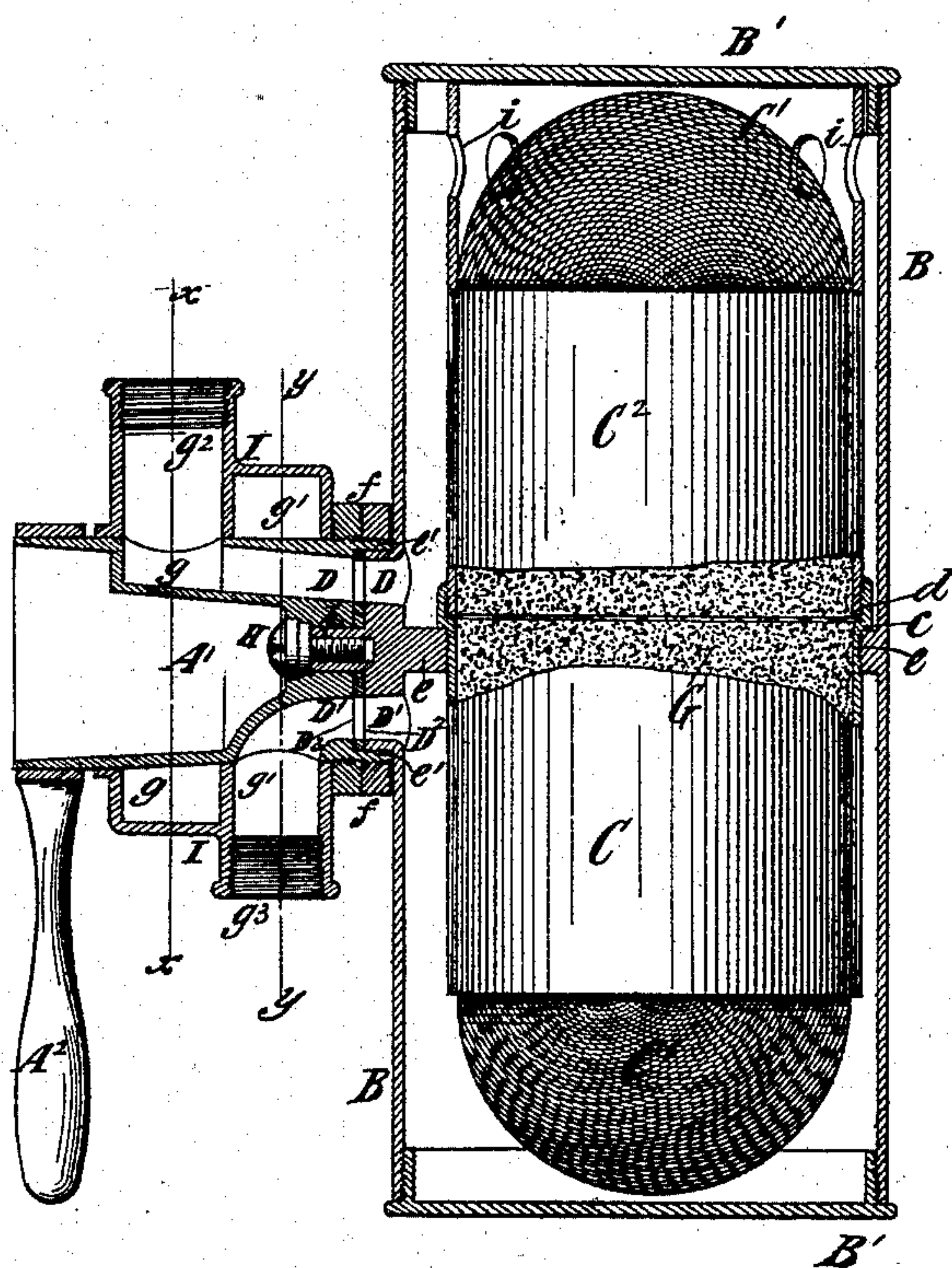


Fig. 9

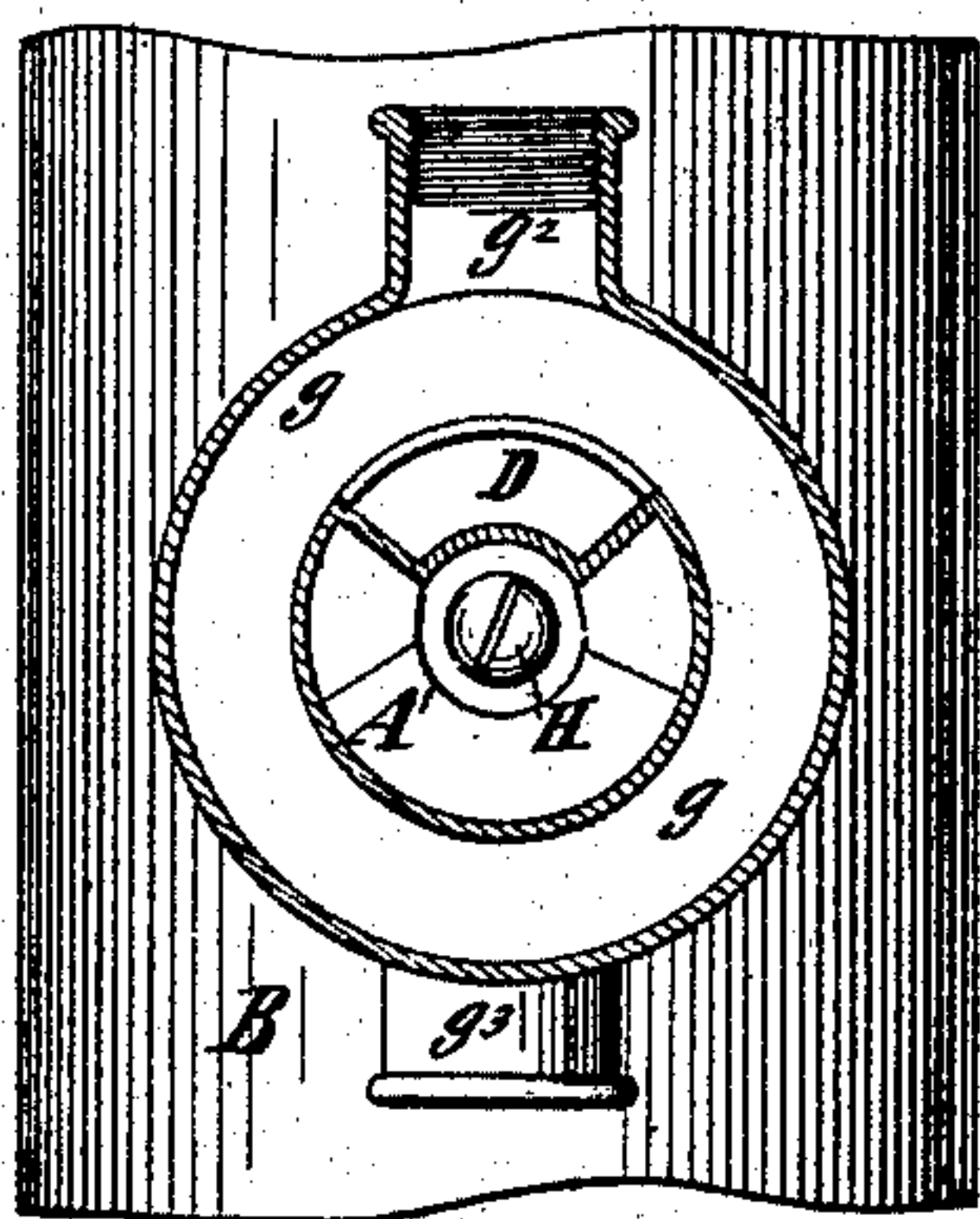
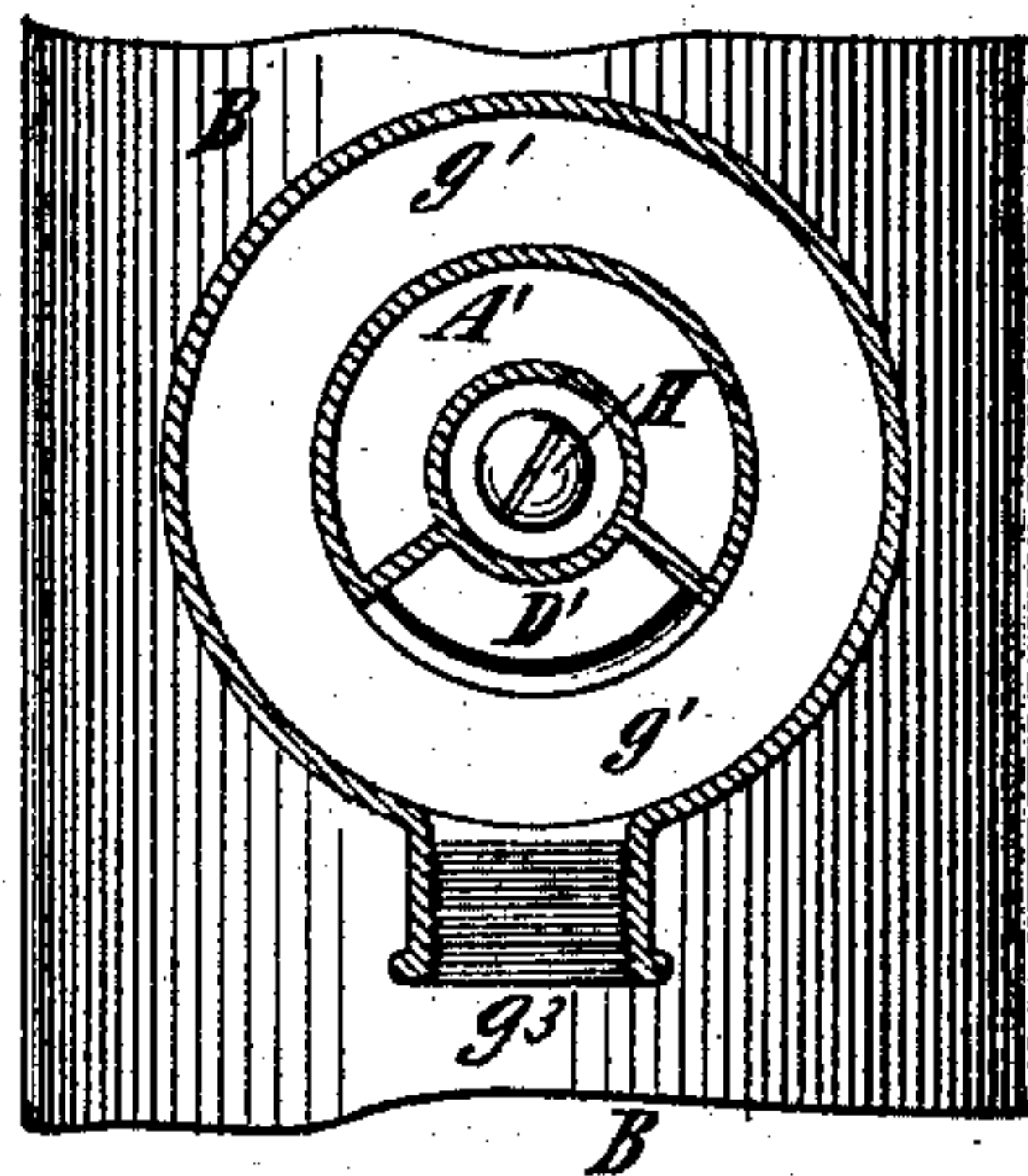


Fig. 10



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UNITED STATES PATENT OFFICE.

ALMON M. GRANGER, OF BOSTON, MASSACHUSETTS.

FILTER.

SPECIFICATION forming part of Letters Patent No. 249,339, dated November 8, 1881.

Application filed June 13, 1881. (Model.)

To all whom it may concern:

Be it known that I, ALMON M. GRANGER, of Boston, in the county of Suffolk, and State of Massachusetts, have invented certain new and useful Improvements in Filters, of which the following is a specification.

My invention is applicable to small filters which are of convenient size and form to be readily screwed upon an ordinary faucet or cock, and also to larger filters which are adapted to be inserted in the service-pipes of buildings; and the especial object of the invention is to provide a filter for either of the above uses which, without separating the filter and faucet or cock, may be reversed to cause the current of water to pass through it in either direction, and thus automatically clean the filter of dirt and solid matters deposited in it. Another object is to enable the filter to be readily adjusted so that the water will not pass through it at all, but will pass around it without being filtered.

The invention consists, essentially, in the combination of a filter-body or outer shell, divided transversely and provided with an external valve face or seat in which are two ports leading to opposite ends of said body or shell, a double liquid-chamber, one part of which communicates with the supply-pipe and the other with the discharge, and which is provided with an external valve face or seat in which is an inlet and an outlet port, and a pivot connecting said body and chamber, so that one or the other may be partially rotated or turned to bring either port in the body into coincidence with the inlet-port in said chamber and the other port into coincidence with the outlet-port in said chamber, whereby I provide for readily reversing the direction of the current of liquid passing through the filter by simply turning the filter body or shell or the double water-chamber partly round, as more fully hereinafter will be described.

Where the invention is embodied in a small filter for application to a faucet or cock the double water-chamber is adapted to be screwed upon the faucet or cock, and the filter-body or outer shell is adapted to be turned to reverse the current; but in a larger filter, adapted to be inserted in a service-pipe, the filter body or shell is the stationary part and the double

water-chamber is made in the form of a plug-valve, which may be turned to reverse the current.

The invention also consists in a novel construction of the above-described parts, which enables the filter to be readily adjusted so that the water will not pass through it at all, and in various details of construction of the filter, to be hereinafter described.

In the accompanying drawings, Figure 1 represents a sectional view of a small filter embodying my invention and applied to a faucet or cock. Fig. 2 represents a side view of the filter alone, the outer shell or body being somewhat shorter than in Fig. 1. Figs. 3 and 4 represent perspective views of the two parts of the filter detached from each other. Figs. 5 and 6 represent similar perspective views, showing the body or outer shell in a different position. Fig. 7 represents a section of the interior parts of the filter body or shell. Fig. 8 represents a longitudinal section of a larger filter of modified form, also embodying my invention. Fig. 9 represents a transverse section on the dotted line *x x*, Fig. 8; and Fig. 10 represents a similar section upon the dotted line *y y*, Fig. 8.

Similar letters of reference designate corresponding parts in all the figures.

Referring first to Figs. 1 to 7, inclusive, but more particularly to Fig. 1, A designates an ordinary faucet or cock, having an externally screw-threaded nozzle, J, and A' designates one part of my improved filter, which I term a "double water-chamber," and which has at one end an internal screw-thread for engaging with the screw-thread J, and at the other end an external screw-thread, J', to which a hose or other article may be attached. The external screw-thread also provides for readily attaching the water-chamber A' to any device or fitting having an internal screw-thread. The water-chamber A' contains two ports—an inlet port, D, leading from the faucet or cock, and an outlet-port, D', leading to the discharge—and both said ports terminate in a valve-seat, D², of circular form.

B designates the outer shell or body of the filter, one end of which is represented as solid, while the other end is closed by a screw cap or bonnet, B'. The inner shell of the filter is

composed of two cylindric ports, $C\ C^2$, screwed together at d , the former, C , having a shoulder, c . The outer shell or body, B , is divided and has an inwardly-projecting flange, e , about
 5 midway of its length, and the inner shell, $C\ C^2$, fits snugly within said flange, as clearly seen in Fig. 1, and is supported by the shoulder c resting upon the flange and held thereon by the bonnet or cap B' bearing upon the up-
 10 per end of the part C^2 , wherefore it will be seen that the portion of the body outside the inner shell is divided transversely by said flange e into two compartments, E . The filter has two hemispherical heads, C' , of wire-gauze
 15 or other reticulated or perforated material, the lower one secured in the lower part, C , of the inner shell, and the upper one fitting within the upper part, C^2 , of said inner shell, and held down by the bonnet or cap B' . Between the
 20 heads C' is placed any suitable filtering material, G , which may be found to best answer the purpose. One end of the inner shell, $C\ C^2$, (in this instance the lower,) is in free communication through the head C' with the outer
 25 shell or chamber, B , upon one side of the flange e , while the upper end communicates with the shell B on the other side of the flange e by means of holes or perforations i in the upper portion of the part C^2 .

30 Upon the exterior of the filter-body or outer shell, B , is a circular valve-face, D^3 , which corresponds to the valve-seat D^2 on the water-chamber A' and fits within a circular rim or flange, e' , thereon, whereby the parts A' and
 35 B are properly centered relatively to each other.

Projecting from the center of the valve-face D^3 is a journal or stem, h , which fits in a corresponding socket or bearing in the water-chamber A' , and the two parts are held tightly to-
 40 gether by the screw H , a packing, d' , of leather or other suitable material being introduced between the valve-seat D^2 and the valve-face D^3 , to form a tight joint and prevent leakage.

In the valve-face D^3 are two ports, $D\ D'$, of
 45 segmental form corresponding to the ports $D\ D'$ in the valve-seat D^2 , and the former of which communicates with the body of the filter upon one side of the flange e , while the latter com-
 50 municates with said body upon the other side of said flange. In the position shown in Fig. 1 the ports $D\ D'$ are coincident, as also are the ports $D'\ D'$, and it will therefore be seen that water is free to pass from the faucet or cock
 55 through the ports $D\ D'$, thence through the holes $i\ i$ down through the filter and out through the ports $D'\ D'$. After being so used, whenever it may be desirable to reverse the current to clean the filter, the body B is turned or rotated so as to bring the ports $D\ D'$ in the
 60 body coincident respectively with the ports $D'\ D'$ in the seat D^2 , whereupon the water will be free to pass through the ports $D\ D'$ into what is now the lower head, C' , of the filter, thence downward through the filter, out at the holes
 65 i , and thence through the ports $D\ D'$ to the discharge or outlet J' . It will therefore be

seen that in this case the body B forms a rotary valve for controlling the passage of water from the inlet-port D in the water-chamber A' to either of its ends. The form of the ports
 70 $D\ D'$ and their position relatively to each other is the same in Figs. 3 and 4 as in Fig. 1. From Figs. 3 and 4 it will be clearly seen that the ports $D\ D'$ are of considerable length, and the distance between the adjacent ends of the two
 75 ports in either the valve-seat D^2 or the valve-face D^3 is very much shorter than the length of either port. When the body or outer shell, B , is turned a quarter of a turn to the position shown in Figs. 5 and 6 it will be seen that the
 80 ports $D\ D'$ in the valve-face D^3 will each overlap the two ports $D\ D'$ in the valve-seat D^2 , and hence the water can pass freely from the port D in the seat D^2 , through both ports $D\ D'$ in the face D^3 to the outlet-port D' in the
 85 seat without passing through the filter.

The body or outer shell, B , of the filter, shown in Figs. 2 to 6, is similar to that shown in Fig. 1, except that it is somewhat shorter; and Fig. 7 represents a sectional view of the inner shell
 90 thereof. The inner shell, C^2 , is made in a single piece and has at the bottom an internal ring, e^2 , to which the lower reticulated or perforated hemispherical head C' is soldered, while the upper head C' rests thereon. The
 95 shell C^2 is provided with holes i for the passage of water, and the filtering material is introduced between the heads C' . The lower edge of the shell C^2 forms a shoulder, c , adapted to rest upon a flange in the body B , as pre-
 100 viously described.

Referring, now, to Figs. 8, 9, and 10, which represent a large filter embodying my inven-
 105 tion, I would say that the filter proper and its internal construction is exactly like that shown in Fig. 1 and previously described, except that the outer shell or body, B , is closed at each end by a cap or bonnet, B' , and all letters of reference used in describing the filter proper shown in Fig. 1 apply equally to Figs. 8, 9, and
 110 10. The water-chamber A' is, however, different, and requires particular description. In this instance the water-chamber A' is made in the form of a hollow plug-valve having a valve-face, D^3 , corresponding to the valve-seat D^2
 115 upon the body or outer shell, B , as in Fig. 1, and having an annular rim or flange, e' , in which the seat D^2 fits, and by which it is centered. As in Fig. 1, the body or shell B has a projecting stem, h , which enters a correspond-
 120 ing cavity or socket in the valve-face of the water-chamber A' , and said valve is secured in place by a screw, H , a leather or other packing being introduced between the valve seat and face. The valve A' is provided with a han-
 125 dle, A^2 , whereby it may be turned, and it is fitted to a taper seat in a water-chest, I , which is retained in place by nuts f . The water-chest is constructed with two annular water-pas-
 130 sages, $g\ g'$, the former of which has an inlet-nozzle, g^2 , for the attachment of an inlet-pipe, and the latter of which has an outlet-nozzle, g^3 ,

for the attachment of a discharge-pipe. The two nozzles g^2 g^3 are prolonged through the seat of the valve A' in the chest I , and in the valve are the above-described ports D D' . As here shown, the inlet nozzle and port g^2 communicates through the port D in the valve A' with the port D in the body B , and the outlet nozzle and port g^3 communicates through the port D in the valve A' with the port D' in the body. By turning the valve A' half round the inlet-port g^2 is placed in communication with the port D' in the filter-body, and the outlet-port g^3 in communication with the port D in the filter-body, thus reversing the current therein. In this example of my invention the body of the filter is fixed or stationary, and the water-chamber constitutes a valve for regulating the flow of water to either end of the filter proper.

By my invention I provide for automatically cleaning filters by simply reversing them or the valves controlling the flow of water to them, and which are of simple construction and effective in operation.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the filter-body or outer shell, divided transversely and provided with an external valve face or seat in which are two ports leading to opposite ends of said body or shell, a double liquid-chamber having an external valve seat or face in which are inlet and outlet ports, and a pivot connecting said body and chamber, so that one or the other may be rotated to bring either port in the body into coincidence with the inlet-port in said chamber and the other port into coincidence with the outlet-port in said chamber, substantially as specified.

2. The combination of the filter-body or outer shell, B , having the external valve seat or face

containing ports D D' , each greater in length than the distance between their ends, the water-chamber A' having the external valve face or seat containing ports D D' , each greater in length than the distance between their adjacent ends, and the pivot H , whereby provision is afforded for discharging liquid without passing it through the filter, substantially as specified.

3. The combination of a filter-body or outer shell having an external valve-face containing ports leading to opposite ends thereof, a double water-chamber adapted to be secured to a faucet or cock and having an external valve-seat containing inlet and outlet ports, and a pivot connecting said body or shell and said chamber, whereby provision is afforded for reversing the current of liquid through the filter by partly rotating said body or shell upon said valve-seat, substantially as specified.

4. The combination of the filter-body or outer shell, B , having the external circular valve-face, and the central projecting stem or journal, h , the water-chamber A' , having the circular valve-seat surrounded by the rim or flange e' , and a socket or bearing for the stem or journal h , and the screw-pivot H , substantially as specified.

5. The combination, in a filter, of an outer shell or body having an inwardly-projecting flange at about the middle of its length, an inner shell containing filtering material fitting within and resting upon said flange and having reticulated or perforated heads, and a cap or bonnet for closing said outer shell or body and holding said inner shell or body upon the said flange, substantially as specified.

ALMON M. GRANGER.

Witnesses:

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