

(No Model.)

J. GRANT.  
Filter.

No. 241,352.

Patented May 10, 1881.

Fig:1.

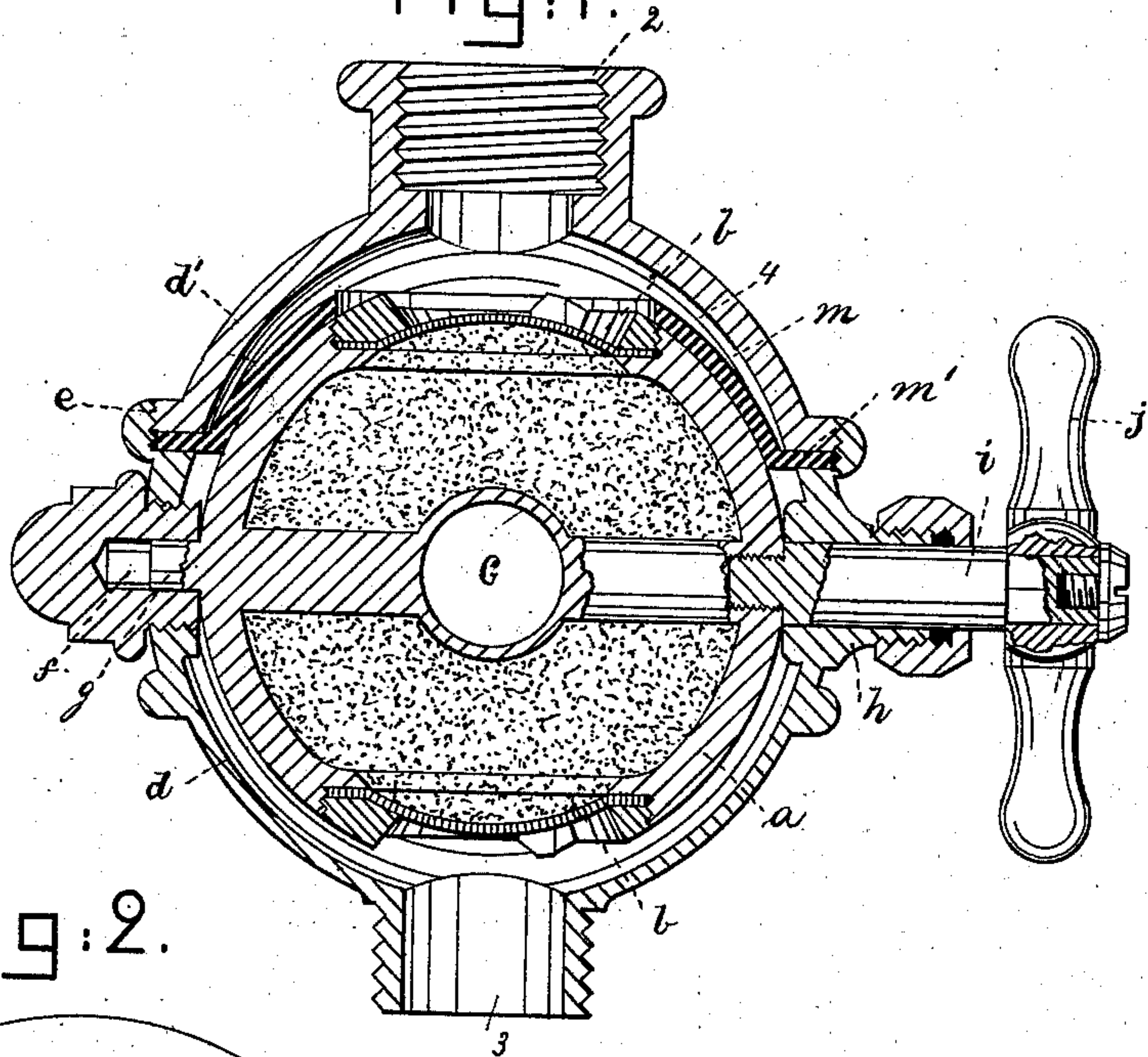


Fig:2.

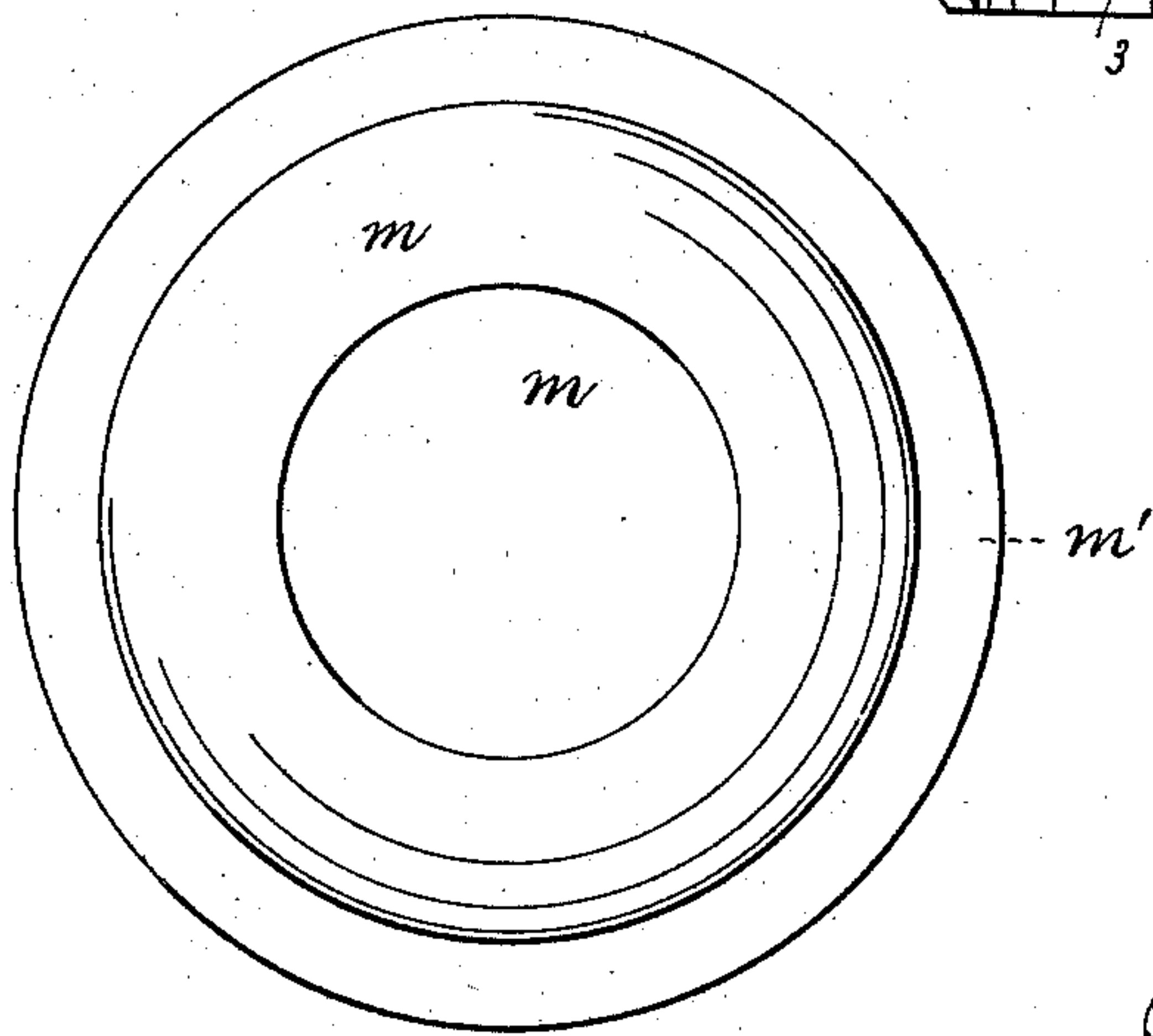


Fig:3.

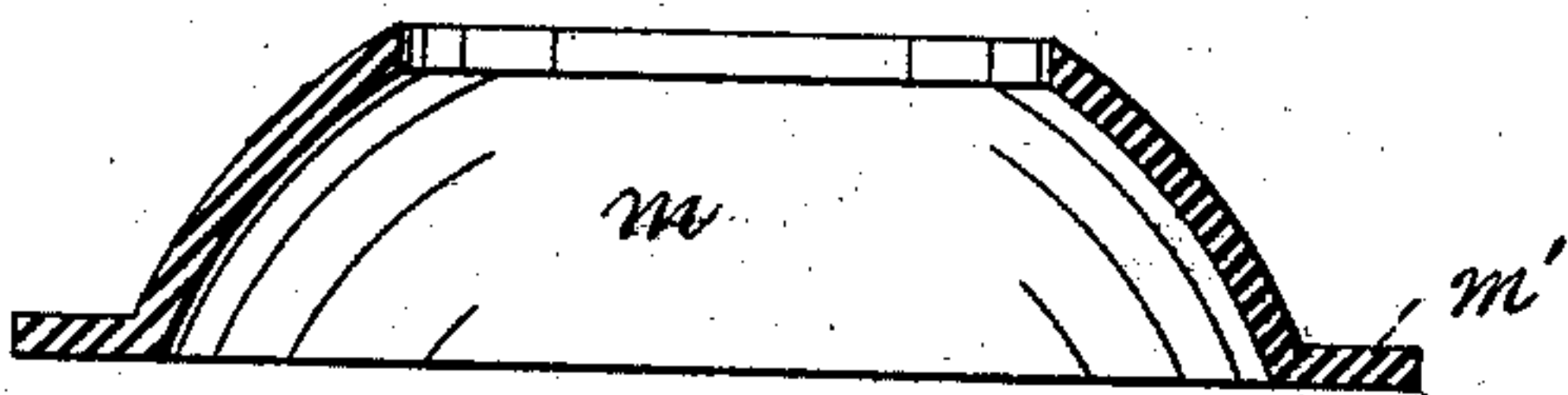
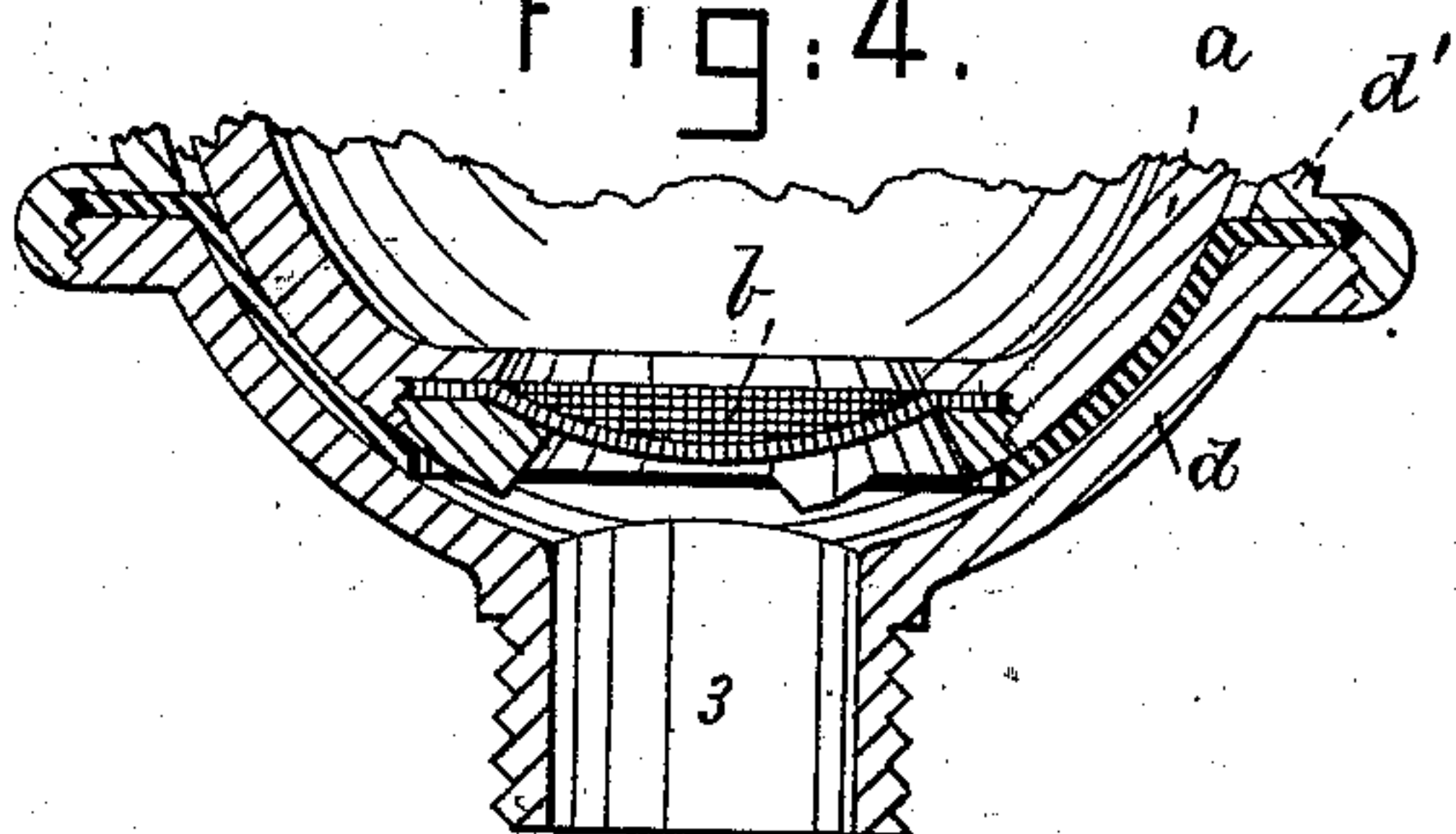


Fig:4.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## FILTER.

SPECIFICATION forming part of Letters Patent No. 241,352, dated May 10, 1881.

Application filed December 20, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, JOTT GRANT, of Boston, county of Suffolk, State of Massachusetts, have invented Improvements in Filters, of which the following description, in connection with the accompanying drawings, is a specification.

My invention relates to filters, and is shown embodied in that class of filters consisting, essentially, of a hollow spherical shell containing filtering material, as fragments of charcoal, and provided with passages on opposite sides, by which the water enters the said shell, and after filtering through the material therein passes out to be used, and a spherical inclosing-case for the said shell adapted to be attached to a water-pipe. The passages entering the shell are provided with coverings of wire-gauze, to confine the inclosed filtering material, and also to act as a strainer to intercept the coarser portions of foreign matter; and in order that such intercepted matter may be removed before too great a quantity has collected the shell is adapted to be inverted in its case to make what has just been the entrance-passage, on which the said matter has collected, become the exit-passage, so that the said matter is washed away by the first portions of the fluid that come through.

The shell being thus movable in the case it is necessary that there should be a packed joint between the said shell and case, in order to insure that the fluid to be filtered shall all pass through the shell, and not between it and the case; and to provide a simple and efficacious packing for this purpose is the object of my invention.

In the arrangement heretofore employed the water has usually passed vertically downward through the shell, and the latter has to be rotated on a horizontal axis, to invert it, by a handle extended out through the side of the case, and the packing has usually been effected by having a ground seat or a washer in the lower portion of the case, upon which the shell fits accurately.

In order to insure that the shell shall come to a proper bearing on a seat of this kind, it is necessary that the shell be placed loose in the case and not mounted on pivots, and a loose

connection has to be formed between it and the valve-stem, which has to pass out through the side of the case through a packed bearing. A shell mounted loose in this manner does not operate so well as when mounted by pivots on a fixed axis, and when a flexible washer is used it is apt to adhere to the shell when turned, and be thereby moved from its seat, thus necessitating taking the filter apart to restore the said washer to its place before it will again operate properly.

These objections are all removed by my invention, which consists in the employment of a washer of flexible material—as leather or rubber—having a portion shaped as a zone to fit upon the surface of the shell, and an annular flange extended outward from one edge of the said zone, and adapted to be inserted between the two portions of the case when fastened together in the usual manner by screw-threads thereon.

The said flange serves as a gasket or washer for the joint between the two portions of the case, and, being held firmly in place between the said portions, prevents the movement of the spherical or zone shaped portion of the washer, which rests against the outside of the shell, fitting so closely thereon as to prevent the passage of fluid between it and the said washer, while the said flange is so closely connected with the case that no fluid can pass between it and the said case. This washer is preferably placed in the upper portion of the case, or that at which the fluid enters, and the flange is placed at the base or largest portion of the zone, which extends upward therefrom as far as need be, it being shown as extending nearly to the edge of the inlet-passage, through which the fluid enters the shell.

As herein shown, the upper portion of the case is not exactly concentric with the shell and zone-shaped portion of the washer therein, so that a space is left between the zone portion of the washer resting on the shell and the upper portion of the case, and the fluid which is free to enter this space acts by its pressure upon the zone-shaped portion of the washer to bring it into more close contact with the shell, insuring perfect tightness.



When provided with a washer in the inlet portion of the case the shell is pivoted on a fixed axis in the said case, and the stem by which it is operated serves as a portion of an axle therefor; and, since it is situated in the portion of the case below the washer, it is unnecessary that special care should be taken to make a tight or packed joint between it and its bearing in the side of the said case.

10 A washer of this kind may be used in the lower portion of the case, instead of the seat hereinbefore described, in which case the flange portion serves to prevent it from adhering to the shell or being displaced thereby.

15 Figure 1 is a vertical section of a filter provided with my invention; Figs. 2 and 3, plan and sectional views, respectively, of the washer detached, and Fig. 4 a modification, in which the washer is placed in the lower portion of the case.

20 The spherical shell *a*, provided with openings or passages *b*, diametrically opposite one another, for the inlet and outlet of the fluid to be filtered, and a tubular passage, *c*, passing through the said shell, to permit a free flow of the fluid without filtering, when desired, is of well-known construction. The said shell *a* is inclosed in a case formed of two portions, *d d'*, adapted to be screwed or otherwise fastened, as at *e*. This case is provided at one side with a step or socket, *f*, to receive a pivot, *g*, on the shell *a*, and at its opposite side with a bearing, *h*, through which a stem, *i*, is inserted and connected with the shell *a* and its inner end, while at its outer end it is provided with a handle, *j*, to enable an operator to rotate it, and with it the connected shell *a*, in order to reverse the positions of the openings *b*, or to bring the passage *c* in line with the inlet and outlet passages 2 3 of the case *d d'* in the usual manner.

40 In order to prevent the fluid entering the case *d d'* at 2 from passing around between the shell *a* and the said case, instead of passing through the said shell, I employ a washer, *m*, shaped or formed as a zone or cup to fit upon the outer surface of the said shell *a*, and provided at its lower edge with a flange, *m'*, to be placed between the two portions *d d'* of the case, it acting as a gasket or washer therefor, to make the joint between the said two portions water-tight.

50 The washer *m* is of flexible material—as, for example, leather or rubber—made of the proper shape by suitable dies, and when placed in position with its flange *m'* securely held in the joint *e* of the case *d d'* the zone-shaped portion fits closely over a considerable portion of the surface of the shell, forming a tight joint therewith.

60 The fluid, in entering the inlet 2 of the case *d d'*, passes down above the outer surface of the zone-shaped portion of the washer *m*, between the said washer and the upper portion, *d'*, of the case, preferably made to leave a space, 4, between it and the washer. The fluid thus pressing on the upper surface of the washer *m*

brings it into more close contact with the shell *a*, insuring an absolutely tight joint therewith, while upon the outer surface of the said washer the passage of the fluid around the shell to the lower portion of the case is cut off by the flange *m'*, and the joint between it and the portion *d'* of the case securely pressed thereon.

70 As none of the fluid can enter the space between the lower portion of the portion *d'* of the case and the shell *a*, it is not necessary that the bearing *h* of the stem *i* should be tightly packed, as has heretofore been demanded when the tight joint between the shell and case was in the lower portion thereof, below the said stem.

80 When desired, my improved washer can be placed in the lower portion of the case, as shown in Fig. 4, in which instance, if the washer be so arranged that its zone portion extends from the flange portion in the direction of the flow of the water, as shown in Fig. 4, the shell will preferably be placed loose in the case, to be brought by its own weight to its seat in the said washer.

90 My improved washer serves at the same time to pack the joint between the two portions of the case where fastened together and to insure a perfect obstacle to the passage of the fluid through the space between the shell and the case, while it is positively secured in position by the clamping action of the case *d d'* thereon.

I claim—

1. In a filter, a movable spherical shell or ball and case therefor, combined with a washer consisting of a zone of flexible material adapted to fit upon the outside of the said shell, and securely held at its edge with relation to the said case, whereby the ball is permitted to move in the case and the flow of fluid between the said ball and case is prevented, substantially as described.

2. In a filter, a movable spherical shell and a spherical case therefor, made in two portions, adapted to be fastened together, combined with a washer consisting of a flexible zone-shaped portion to fit upon the surface of the said shell, and a flange portion to be securely held between the two portions of the case when fastened together, substantially as and for the purpose described.

3. In a filter, a movable spherical shell to contain filtering material, and a case therefor divided into two portions, combined with a flexible washer consisting of a flange to be secured between the edges of the two portions of the said case when fastened together, and a zone-shaped portion to fit on the outside of the shell, and arranged, as described, to extend toward the inlet-passage for the fluid to be filtered, whereby the pressure of the said fluid brings the said zone-portion of the washer into closer contact with the shell, substantially as described.

4. The washer *m*, as shown, composed of the zone-shaped portion and its outwardly-projecting flange *m'*, constructed and arranged to op-



erate substantially as and for the purpose described.

5 5. The movable spherical shell *a* and washer *m m'*, combined with the case *d d'*, adapted to securely hold the portion *m'* of the washer, and leave a space between the portion *m* thereof and the said case, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOTT GRANT.

Witnesses:

G. W. GREGORY,  
W. H. SIGSTON.