

No. 789,968.

PATENTED MAY 16, 1905.

J. H. ERNST.  
FILTER.

APPLICATION FILED JUNE 21, 1904.

Fig. 1.

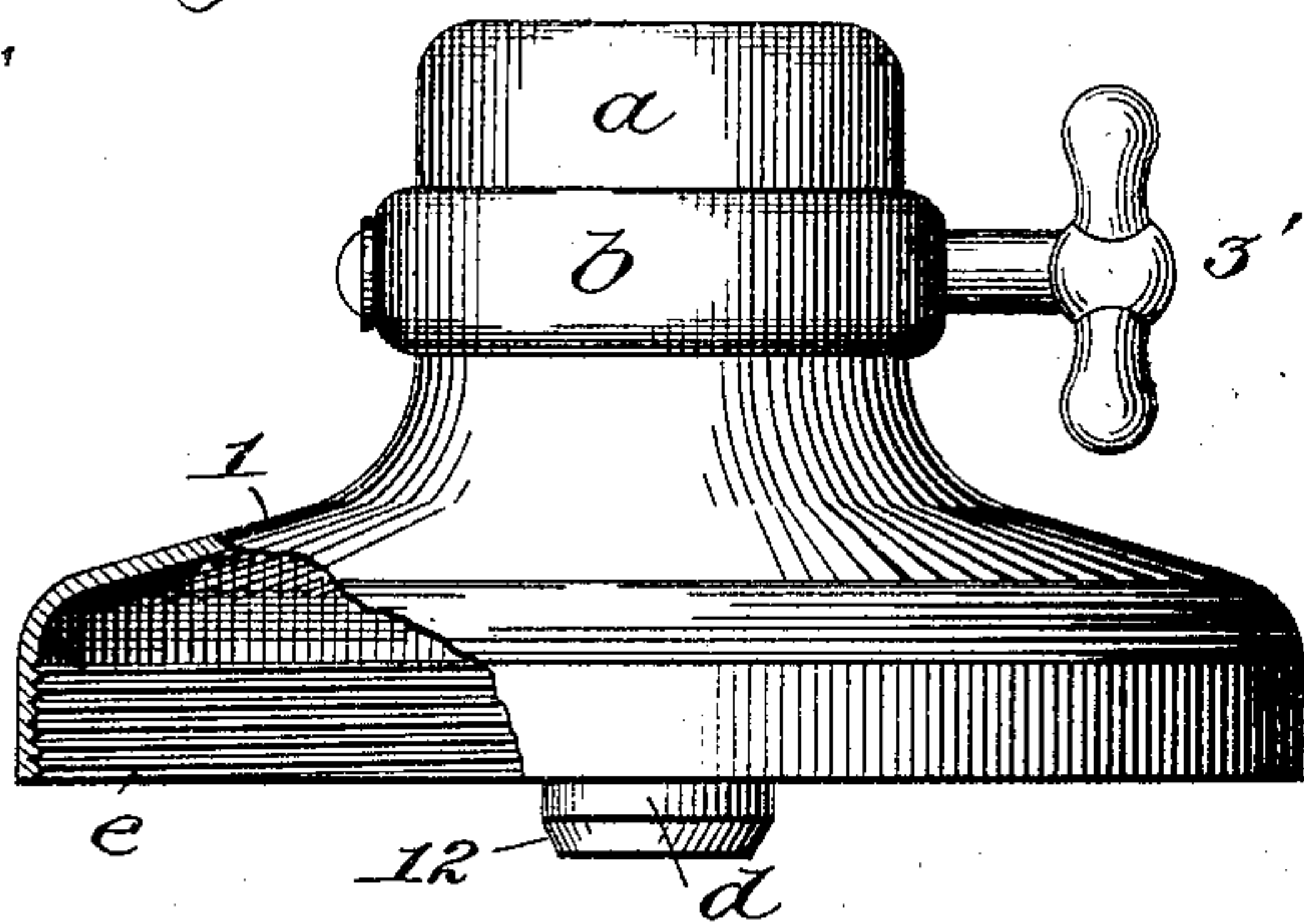


Fig. 2.

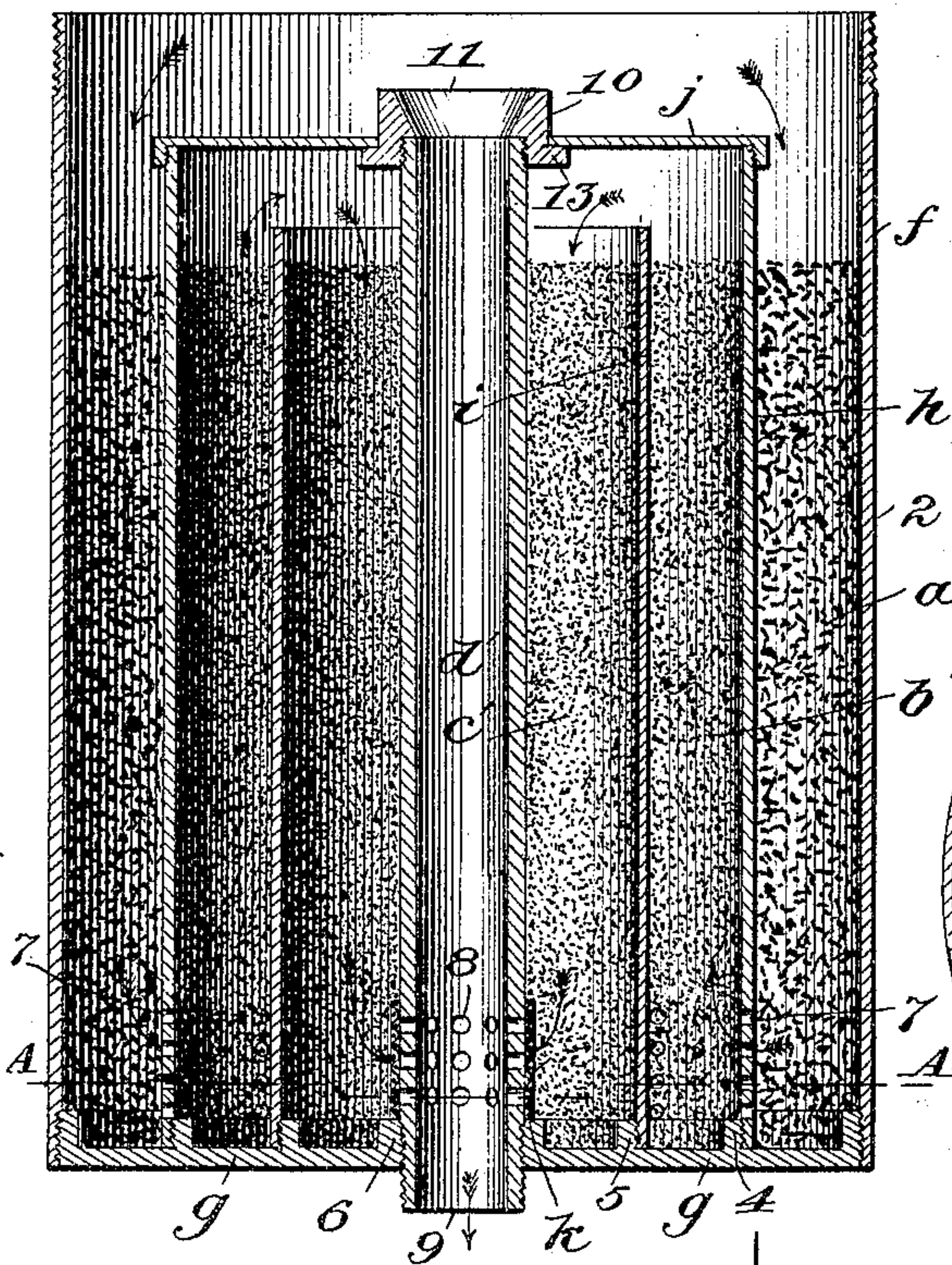


Fig. 3.

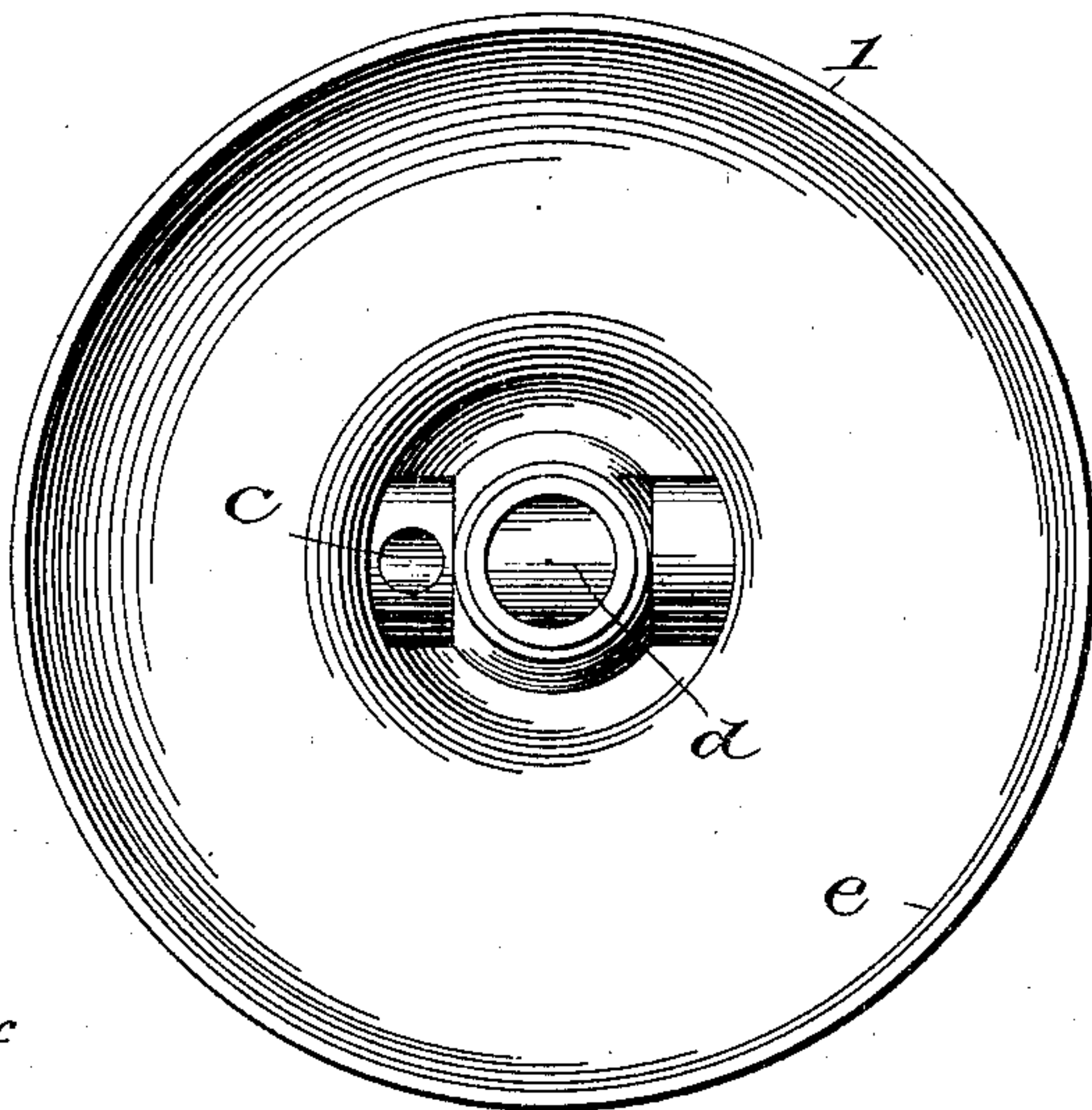


Fig. 4.

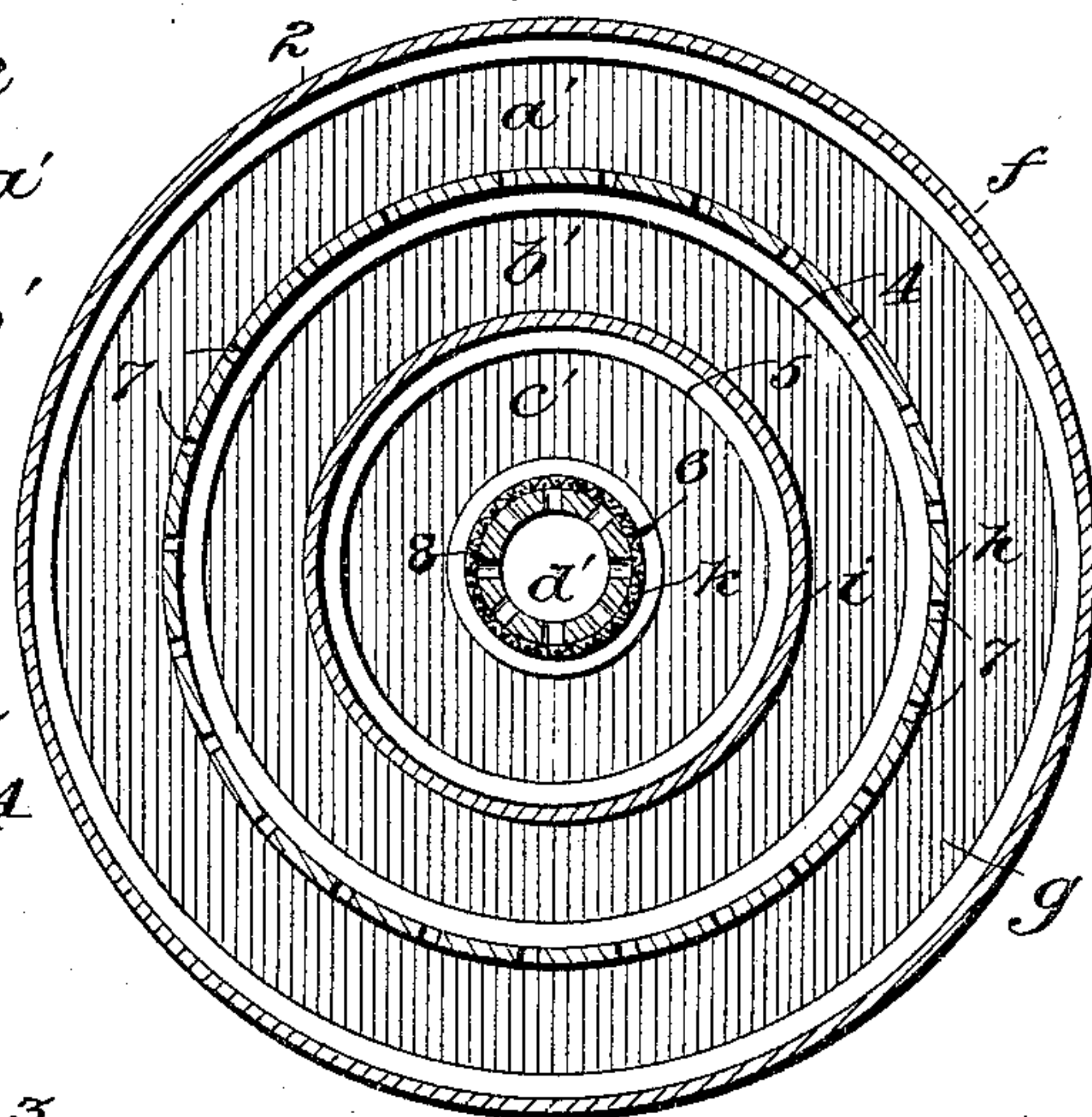
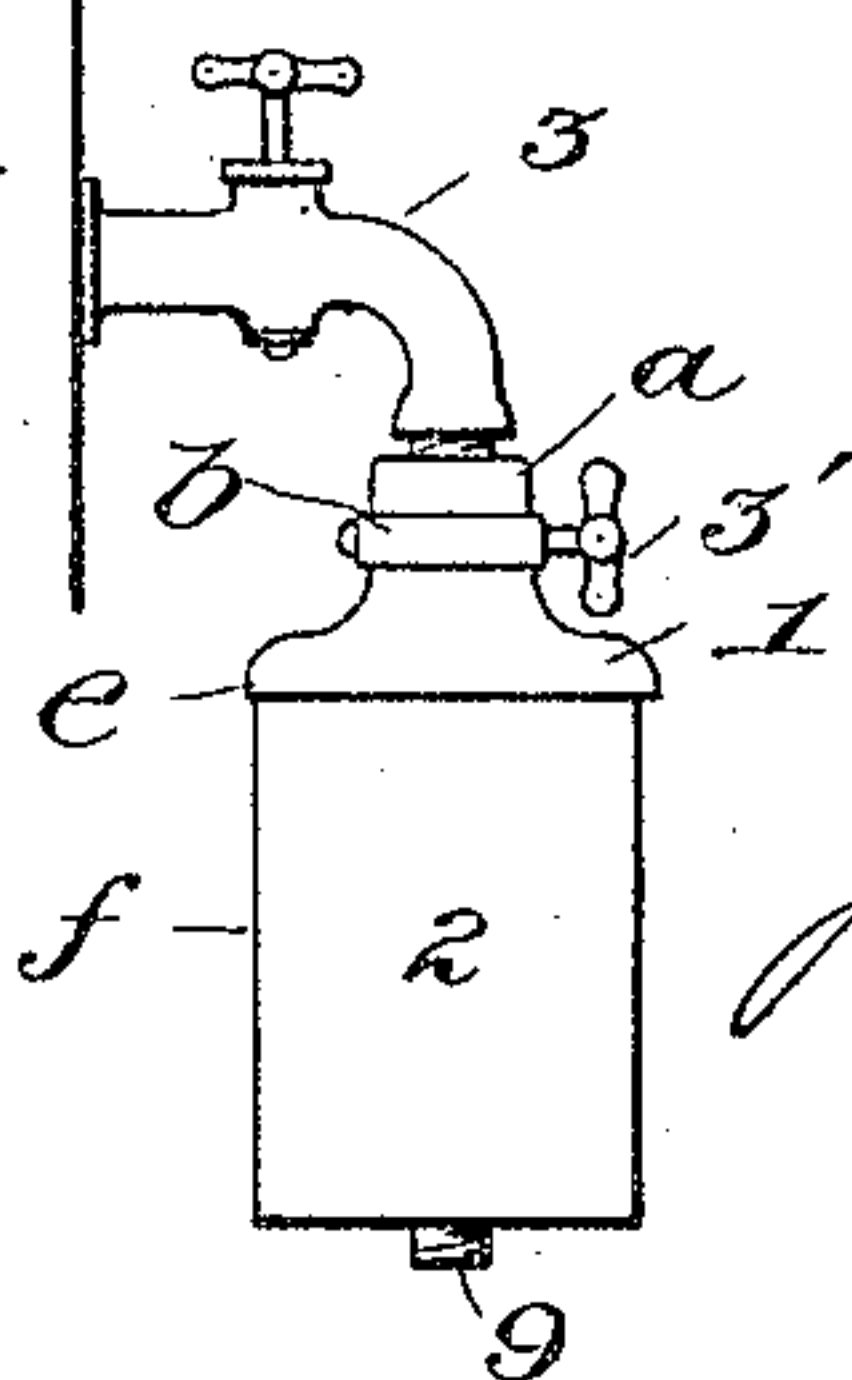


Fig. 5.



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## FILTER.

SPECIFICATION forming part of Letters Patent No. 789,968, dated May 16, 1905.

Application filed June 21, 1904. Serial No. 213,621.

*To all whom it may concern:*

Be it known that I, JOHN H. ERNST, a citizen of the United States of America, and a resident of the borough of Brooklyn, New York city, in the State of New York, have invented a new and useful Improvement in Filters, of which the following is a specification.

This invention relates to depending domestic filters adapted for attachment to the customary faucets above kitchen-sinks or to be substituted therefor and adapted to be filled with sand and charcoal or other approved granular filtering material and to be periodically renovated, so as to prevent any possible contamination of the filtered water.

The present invention consists in an improved filter of simple construction adapted to afford an extended length of passage for the water within a small space and adapted to discharge the water at one and the same point either through the filtering material or more quickly in an unfiltered condition, as may be desired.

A sheet of drawings accompanies this specification as part thereof.

Figures 1 and 2 are respectively a side view, partly in section, of the upper or cap part, and an axial longitudinal section of the lower or body part, of the improved filter. Fig. 3 is a bottom view of the upper or cap part. Fig. 4 is a horizontal section of the lower or body part on the line A, Fig. 2, omitting the filtering material; and Fig. 5 is a small-scale side view of the improved filter attached to a water-faucet.

Like reference numbers and letters refer to like parts in all the figures.

The two main parts of the improved filter, numbered, respectively, 1 and 2 in the drawings and shown, respectively, by Figs. 1 and 3 and Figs. 2 and 4, are constructed of suitable metal in conveniently-formed pieces, and in use the filter is attached to and depends from an ordinary water-faucet 3, as shown in Fig. 5, a collar *a* at the top of said cap part 1 being internally screw-threaded or provided with an elastic coupling, as required for a given style of faucet. A faucet 3, having a screw-nozzle calling for an in-

ternally-threaded collar *a*, is represented in Fig. 5. Immediately below said collar *a* the housing *b* of a three-way cock 3' is suitably formed, together with a port or ports *e* to communicate with the filtering-spaces of the body part 2 and a central direct outlet *d*, the latter in the form of a depending central nozzle or pipe section having a tapered extremity. The shell of said cap part 1 terminates at bottom in a depending circumferential rim *e*, internally screw-threaded.

The body part 2 of the improved filter is constructed with a cylindrical outer wall *f*, having an externally-screw-threaded upper end fitted to said rim *e* of the upper part 1 and attached at bottom to a bottom disk *g*, which is constructed with concentric flanges 4 and 5 on its upper surface and with a central socket 6. Cylindrical partitions *h* and *i* are screwed or, it may be, soldered fast to said flanges 4 and 5. A central pipe-section *d'* is made fast in like manner in said socket 6, and an inner cap *j* is screwed fast to the externally-threaded upper end of said partition *h*, as shown in Fig. 2. Said outer wall *f* and partitions *h* and *i* are adapted in common to be cut in any required lengths from drawn tubing of suitable sizes.

An open-topped annular filtering-chamber *a'*, surrounding the outer partition *h* and cap *j*, may conveniently be filled with sand, fine gravel, or the like and communicates at bottom with the annular space *b'* between the partitions *h* and *i* by way of perforations 7 in said partition *h*. Said annular space *b'* connects freely above the upper edge of the inner partition *i* with an annular space *c'* within the partition last named. Both inner spaces *b'* and *c'* may conveniently be filled with finer sand or with charcoal or other granular filtering material. Outlet-perforations 8 in the lower pipe-section *d'* are guarded externally by fine wire-gauze *k* to prevent the escape of the filtering material with the filtered water. The protruding lower end 9 of the lower pipe-section *d'* forms the outlet of the filter. The pipe-section *d'* is provided at its upper end with an end piece 10, forming a tapered socket 11 for the tapered extremity 12 of the pipe-section *d* of



the cap part 1, and with a circumferential flange 13, which may support a gasket to render the joint at the middle of the inner cap *j* water-tight. Said inner cap *j* is removable to provide for filling the inner spaces *b'* and *c'* with filtering material and for renovating the same periodically. The coarser filtering material within the outer space *a'*, in which the grosser impurities of the water collect, may be more frequently emptied out and washed without disturbing the finer filtering material within the inner spaces.

When the parts are assembled and the filter is attached to a faucet for use, as in Fig. 5, the faucet 3 itself may be left open continuously, the three-way cock 3' being manipulated instead. In one position of this cock its indirect outlet *c*, Fig. 3, is open, and the water flows through the filtering material, as indicated by arrows in Fig. 2, distributing itself first over the top of the coarser filtering material in the outer space *a'* and flowing downwardly through this material and then upwardly and downwardly through the finer filtering material within the spaces *d'* and *c'* and thence into the lower pipe-section *d'* and from the latter through the outlet 9. In another position of said three-way cock 3' the water flows through the central pipe-sections *d* and *d'* and discharges at the outlet 9 without entering the filtering-spaces. In the third position of the three-way cock the flow of water is cut off.

The improved filter may of course be constructed in larger sizes and attached to water-pipes without the interposition of a faucet. Any of the various forms of three-way cocks may be employed, and other like modifications will suggest themselves to those skilled in the art.

Having thus described said improvement, I claim as my invention and desire to patent under this specification—

1. A filter adapted to depend from a water-faucet or the like, and composed of upper and lower main parts separable from each other, the upper part containing a three-way cock with direct and indirect outlets, and the lower part constructed with a lower pipe-section in communication with the direct outlet, and with concentric annular spaces containing filtering material and in communication with the indirect outlet and with each other and with said lower pipe-section; the outermost of said spaces being open at top when said lower part is detached, and the innermost space being covered at top by a removable cap, to provide for renovating the filtering material.

2. A filter adapted to depend from a water-faucet or the like and composed of upper and lower main parts separable from each other, the upper part containing a three-way cock with outlets including a central upper pipe-section, and the lower part constructed

with concentric partitions forming annular filtering-spaces and with a central lower pipe-section adapted to form a continuation of said upper pipe-section, the outer partition and said lower pipe-section having perforations at bottom, and the inner partition forming a communication between the two inner spaces at top, whereby the water may be discharged direct through said pipe-sections unfiltered or may be made to flow lengthwise through the several filtering-spaces in series, at will.

3. A filter adapted to depend from a water-faucet or the like and composed of upper and lower main parts, the upper part provided at top with a coupling and beneath this with a three-way cock and a depending circumferential flange, and the lower part adapted to be coupled to said flange and composed of a cylindrical shell and concentric cylindrical partitions adapted to be cut from drawn tubing, a central pipe-section open at both ends and adapted for the discharge of unfiltered water direct and also for the discharge of the filtered water, a bottom disk to which said shell and partitions and said pipe-section are attached, and an inner cap removably attached to the top of the outer partition; said outer partition being perforated at bottom for the passage of water, and the inner partition forming a communication between the spaces on both sides of it at top, and said pipe-section having perforations for the escape of the filtered water into and through said pipe-section.

4. A filter adapted to depend from a water-faucet or the like and composed of upper and lower main parts, the upper part provided at top with a coupling and beneath this with a three-way cock and a depending circumferential flange, and the lower part adapted to be coupled to said flange and composed of a cylindrical shell and concentric cylindrical partitions, a central pipe-section open at both ends and adapted for the discharge of unfiltered water direct and also for the discharge of the filtered water, a bottom disk constructed with concentric flanges to which said partitions are attached and a central socket for said pipe-section, and an inner cap removably attached to the top of the outer partition; said outer partition and said pipe-section being perforated immediately above said bottom disk for the passage of water, the inner partition forming a communication between the inner spaces immediately beneath said inner cap, and said perforations of the pipe-section being protected externally by wire-gauze or the like, substantially as hereinbefore specified.

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