

No. 677,295.

Patented June 25, 1901.

H. A. WALKER.
FILTER.

(Application filed Jan. 2, 1901.)

(No Model.)

2 Sheets—Sheet 1.

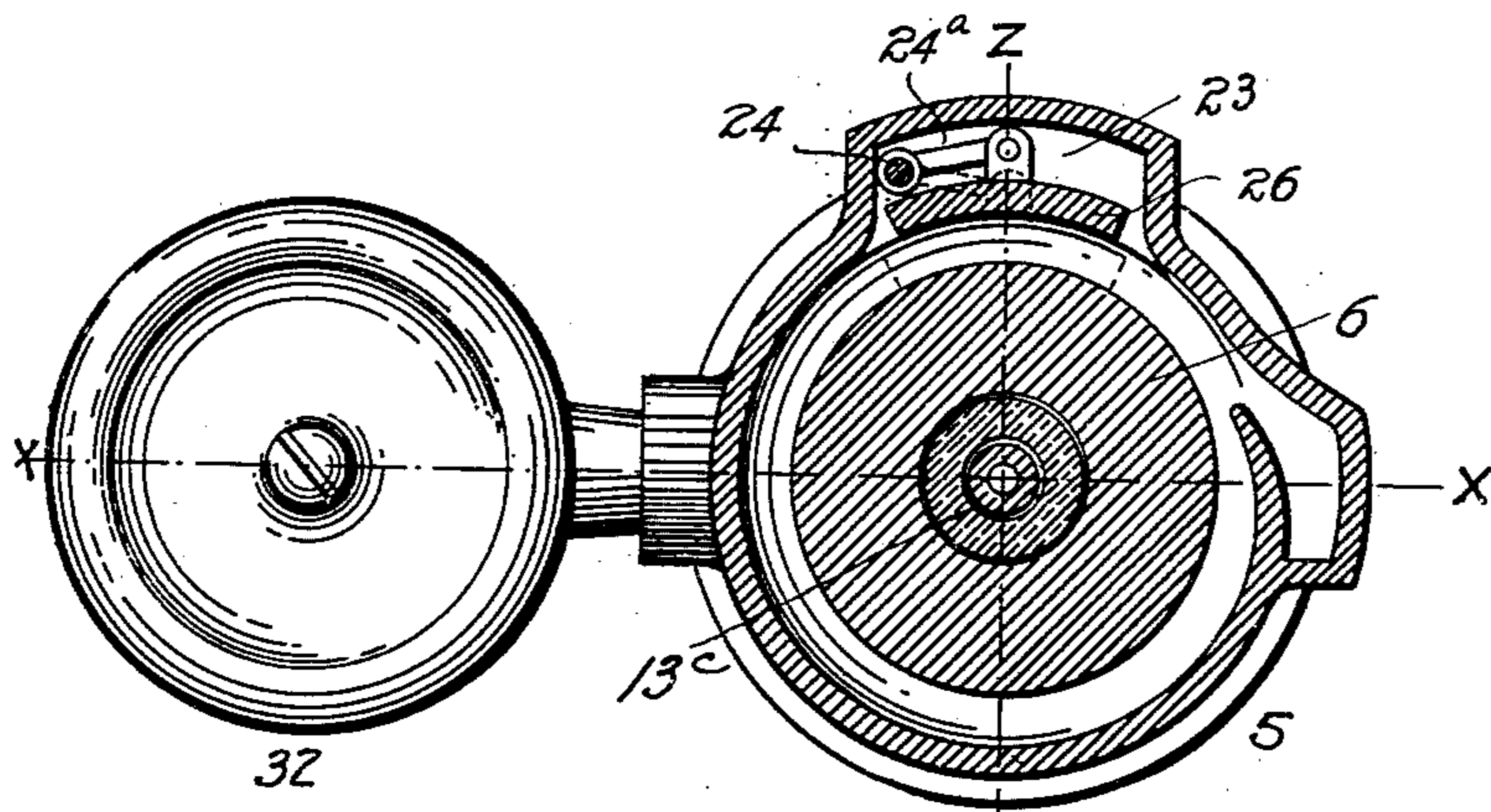


FIG. 2

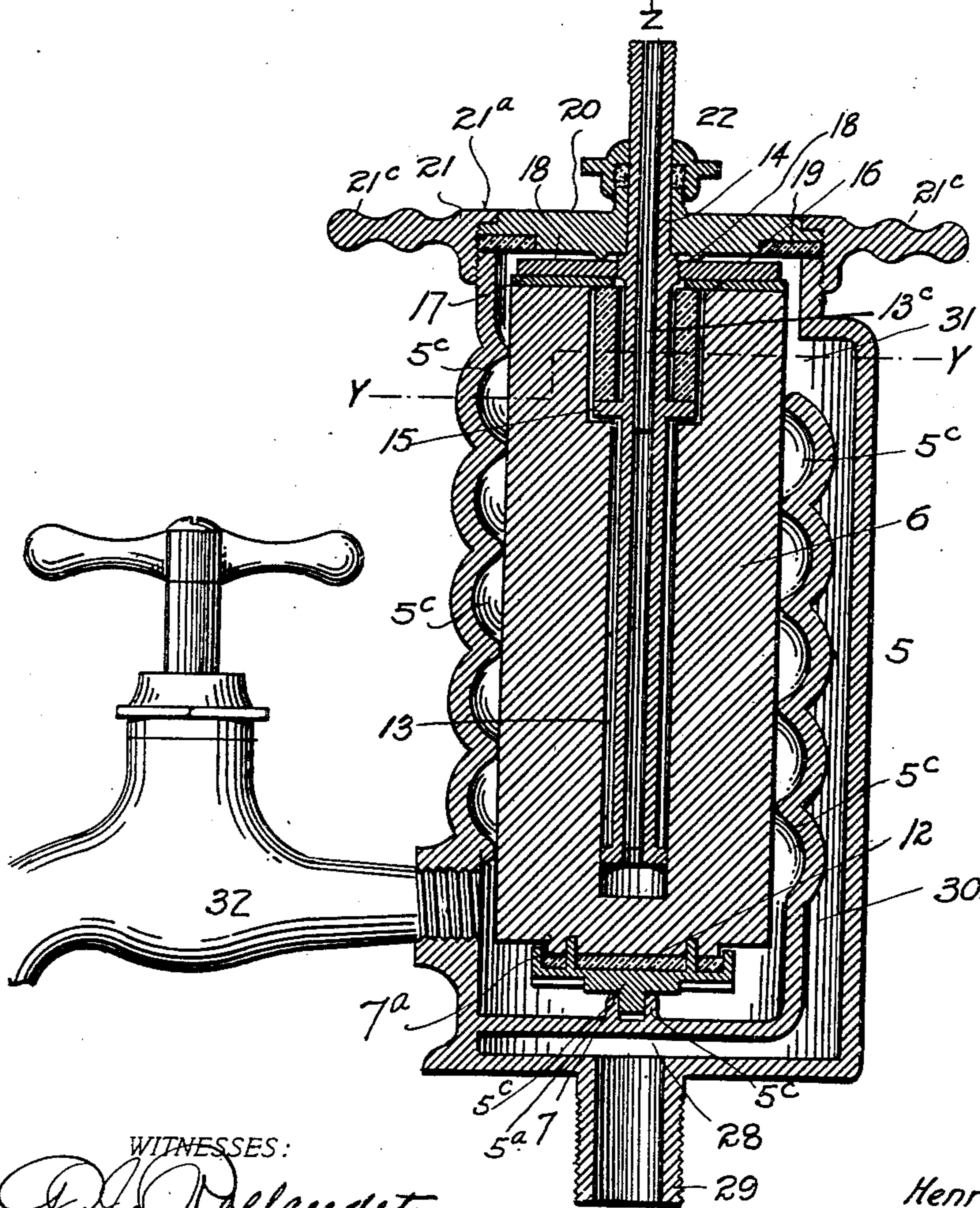


FIG. 1.

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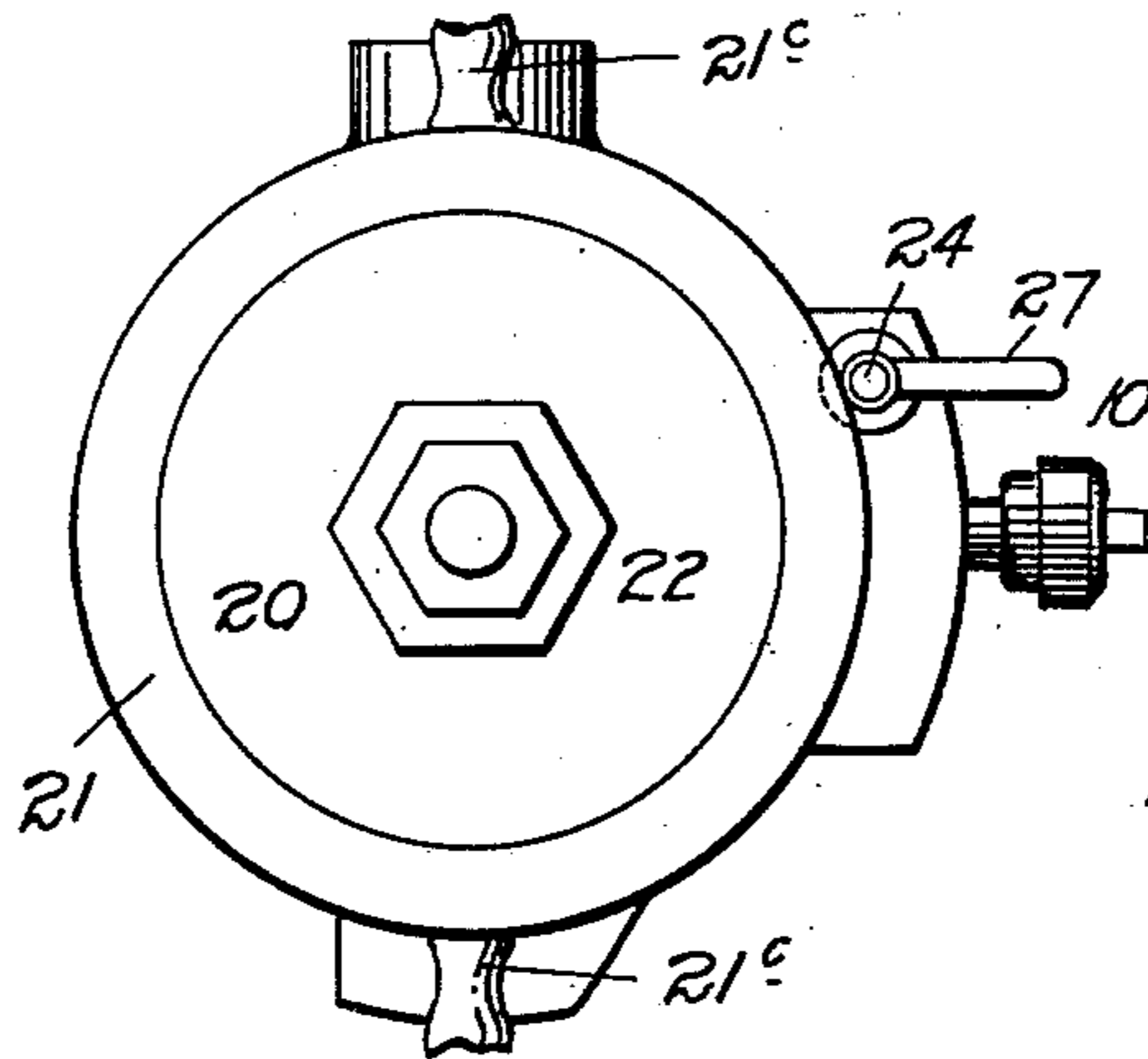


FIG. 4.

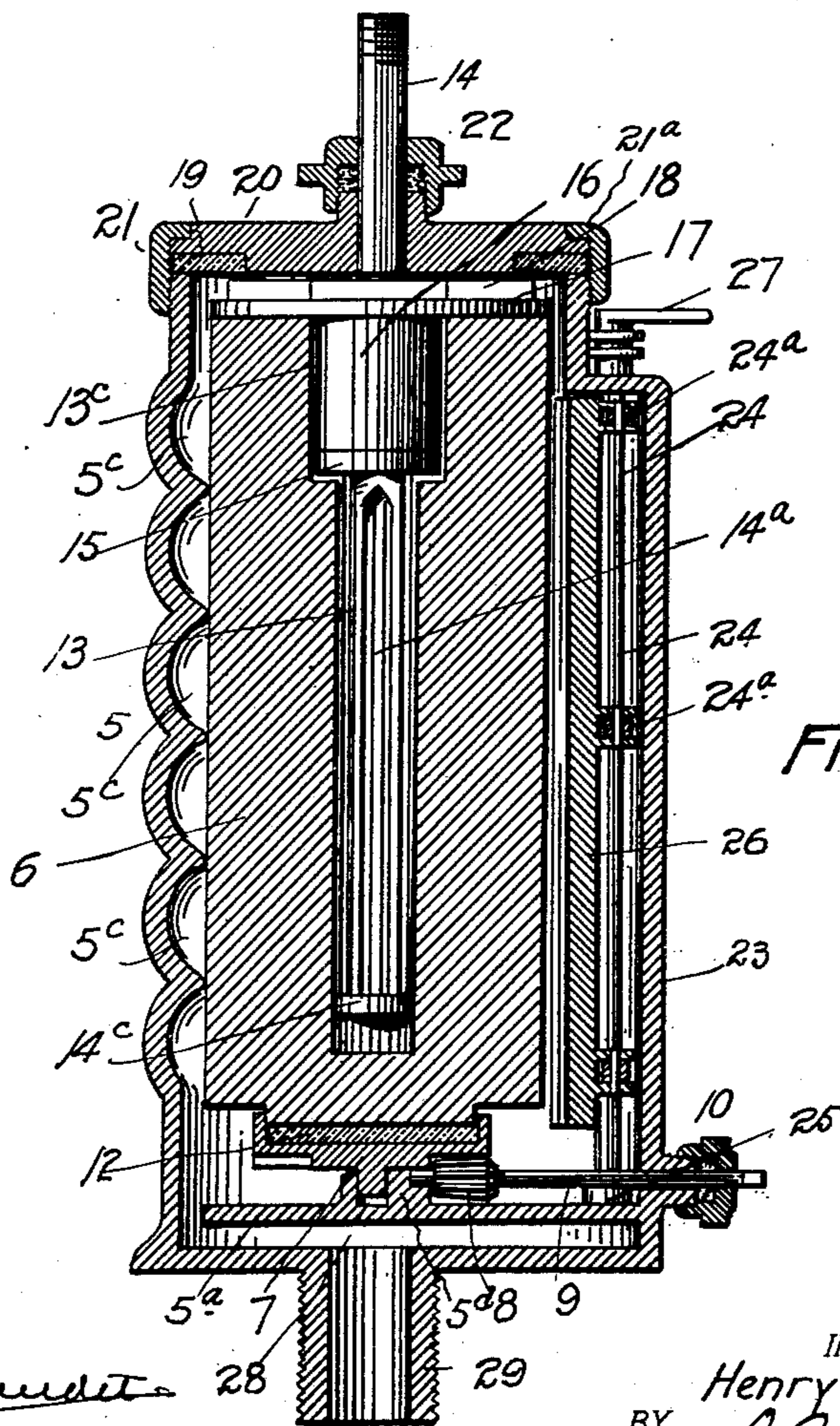


FIG. 3.

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UNITED STATES PATENT OFFICE.

HENRY A. WALKER, OF DENVER, COLORADO, ASSIGNOR OF ONE-HALF TO
FREDERICK W. WALKER, OF SAME PLACE.

FILTER.

SPECIFICATION forming part of Letters Patent No. 677,295, dated June 25, 1901.

Application filed January 2, 1901. Serial No. 41,921. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. WALKER, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Filters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in filters adapted to be connected with sink or basin faucets or for use wherever filtered water is required.

The invention consists of certain novel features of construction and arrangements of parts, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a vertical longitudinal section of my improved filtering apparatus, taken on the line xx , Fig. 2. Fig. 2 is a cross-section taken on the line yy , Fig. 1. Fig. 3 is a vertical section of the device, taken on the line zz , Fig. 2. Fig. 4 is a top or plan view of the filter.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a casing in which is located a body of filtering material 6, preferably consisting of an integral piece or cylinder of porous stone of suitable quality. In the bottom 5^a of the casing is located a lug 5^c, provided with a socket in which is journaled a horizontal gear-wheel 7, having cogs on its under surface. This gear is connected in operative relation with a pinion 8, fast on a shaft 9, which protrudes through an opening in the casing, surrounded by a stuffing-box 10, its inner extremity being journaled in a recess formed in one side of the lug 5^d. The outer exposed extremity of this shaft is fashioned to receive an operating-crank. (Not shown.) The gear 7 is provided at its outer edge with an upwardly-projecting flange forming a seat for the stone 6, which is shouldered to fit thereinto, whereby

lateral displacement is prevented. Between the gear and the stone is located a cushion 12, composed of rubber or other suitable yielding material. The gear is provided with vertical pins or projections, which pass through the cushion 12 and enter counterpart recesses formed in the bottom of the stone, whereby the latter is made to rotate with the gear for a purpose hereinafter explained.

The center of the stone is provided with a longitudinal opening 13, extending from the top nearly to the bottom thereof. In this opening is inserted a pipe 14, which is open, as shown at 14^a, to permit the filtered water to enter and pass upwardly therethrough. The lower extremity of the pipe 14 is provided with a collar 14^c, which fits into the opening 13. Thus the pipe 14 forms a guide for the stone and has a tendency to maintain it in its proper relative position. In the upper part of the stone 6 the central opening is enlarged, as shown at 13^c. In the bottom of this enlargement and resting on a shoulder of the stone is a collar 15, fast on the pipe 14, while above the collar and resting thereon is a cushion 16, preferably composed of rubber. Above this cushion and also resting on top of the stone is a metal washer 17. The pipe 14 passes upwardly through the packing-cushion 16, the washer 17, and thence through the top of the casing. Above the washer 17 a nut 18 is screwed upon the pipe, whereby the stone and pipe are securely locked together. This is accomplished by the compression of the cushion against the adjacent walls of the filter-body by screwing the nut down tightly on the washer. It will be understood that the cushion 16 is compressed between the collar 15 on the pipe and the washer 17 above. It is demonstrated in actual practice that when the parts are assembled as stated the pipe and filter-body are held securely together, and during the grinding operation, hereinafter described, whereby the filter-body is rotated, the pipe rotates with it, forming a spindle which turns in the top or cap 20 of the casing. During the rotation of the filter-body for this purpose the stuffing-box above the cap is loosened sufficiently to prevent any resistance at this point. This locking of the filter-body and the pipe together is a natural

and necessary result of forming a water-tight joint between the pipe and the upper part of the filter-body in the manner explained in this specification. Located above this nut
 5 and engaging the top of the casing is a rubber gasket 19, which fits a circular groove formed around the outer edge of a cap 20, which is forced down upon the gasket by a nut 21, which engages exterior threads formed
 10 on the top of the casing. This nut overlaps the outer edge of the cap, as shown at 21^a. It is also provided with projections 21^c to facilitate turning. To the top of the cap 20 is attached a stuffing-box 22, surrounding the
 15 pipe 14.

In one side of the casing is formed a vertical auxiliary chamber 23, communicating with the chamber in which the stone is located. In one side of this auxiliary chamber
 20 is located a vertical shaft 24, whose lower extremity is journaled in a socket formed in a lug 25, projecting upwardly from the bottom of the casing. To this shaft are attached a number of crank-arms 24^a, whose extremities
 25 remote from the shaft are suitably connected with a grinding plate or device 26, whose inner surface is shaped to conform to the curve of the filter-stone. This grinding-plate may be formed of emery, metal, or any other suitable
 30 or desirable material. The upper extremity of the shaft 24 protrudes through the casing, which is provided with a stuffing-box surrounding the shaft. To the upper exposed extremity of the shaft is attached a lever-arm
 35 27 to facilitate the operation of the shaft. When it is desired to grind or scour the outer surface of the stone, the shaft 24 is turned to throw the grinding device against the filter-stone, which is then rotated through the instrumentality of the horizontal shaft 9, the pinion 8, and the gear 7 until the desired end
 40 is attained. The inner surface of the casing is provided with a groove or way 5^c, extending spirally therearound from top to bottom, except where the auxiliary chamber 23 is located. This chamber makes a break in the spiral way; but the force of the water will compel it to jump this break, and thus make the spiral path practically continuous. It is
 45 evident, however, that my improved apparatus may be constructed without the grinding feature, and in this event the spiral way will be actually continuous. It is the intention to employ the grinding device only on
 50 filters of considerable size, as it is believed that it will not be necessary on the smaller-sized filters. Below the bottom 5^a of the casing is formed a channel 28, communicating with the inlet-pipe 29. From the channel 28
 60 the water passes upwardly through a vertical channel 30, formed in the wall of the casing. The upper extremity of this channel communicates at 31 with the spiral way 5^c.

When filtered water is not required, the
 65 water passes from the pipe 29 through the channel 30, from whose upper extremity it is discharged into the top of the spiral way 5^c,

in which it flows around the filtering-stone and washes its outer surface, being finally discharged through the faucet 32.

When filtered water is required, the faucet 32 is closed and the water passes through the filter-stone into the central opening 13 and upwardly through the pipe 14, which may lead to any desired point where it is necessary or
 75 desirable to discharge the said water.

Since the filter-stone 6 and the pipe 14 are locked together by the nut 18, the said pipe and filter-stone rotate together with the gear when the latter is actuated.

Having thus described my invention, what I claim is—

1. In a filtering apparatus, the combination of a casing, a body of filtering material located therein, a space being left between the
 85 wall of the casing and the filter-body for the water to circulate, the filter-body having an opening extending from the top thereof downwardly, a pipe located in said opening, its upper extremity being exposed outside of the casing, and its lower portion being open to allow the water to enter, the opening in the upper part of the filter-body being enlarged, a packing-cushion located in the enlarged portion of said opening, a collar fast
 90 on the pipe and upon which the said cushion rests, a washer surrounding the pipe above the cushion, a nut applied to the threaded portion of the pipe above the washer, the construction and arrangement of the parts
 100 being such that a water-tight joint is formed by the cushion around the pipe when the nut is properly tightened, means for introducing water to the casing-chamber outside of the filter-body, an outlet for the unfiltered water,
 105 and a distinct outlet for the filtered water which passes through the central pipe.

2. In a filtering apparatus, the combination with a casing, of a body of filtering material located therein, a space being left between
 110 the wall of the casing and the filter-body for the water to circulate, the filter-body having an opening extending from the top thereof downwardly but not entirely through the filter-body, the lower extremity of said opening being closed, a pipe located in said opening and extending into the lower part thereof forming a guide for the filter-body, the pipe and filter-body being locked together where-
 115 by they will rotate in unison, a grinding device located adjacent the filter-body, and means for rotating the filter-body and pipe for grinding purposes.

3. In a filtering apparatus the combination with a casing, of a body of filtering material
 125 located therein, a space being left between the wall of the casing and the filter-body for the water to circulate, the filter-body having an opening extending from the top thereof downwardly but not entirely therethrough, a
 130 pipe located in said opening and extending into the lower part thereof, forming a guide for the filter-body, the upper extremity of the pipe being exposed above the casing and its

lower portion being open to allow the water to enter, the opening in the upper part of the filter-body being enlarged, a packing-cushion located in the enlarged portion of said opening, a collar fast on the pipe and upon which said cushion rests, a washer surrounding the pipe above the cushion, a nut applied to the threaded portion of the pipe above the washer, the construction and arrangement of the parts being such that the pipe and filter-body are locked together whereby they will rotate in unison, a grinding device located adjacent the filter-body, and means for rotating the filter-body.

4. In a filtering apparatus, the combination of a casing, a filter-body located therein, a spiral channel being formed in the casing around the filter-body, said channel having curved walls, means for introducing water to one extremity of said channel, an outlet for unfiltered water at the opposite extremity of the groove, the filter-body having a central opening closed at the bottom, and a conduit projecting into the lower part of said opening and forming a guide for the filter-body, said conduit leading from said opening for the discharge of the filtered water.

5. The combination with a casing and a filter-body located therein having a discharge-pipe, of means for forming a water-tight joint around the pipe and the upper part of the filter-body whereby the pipe and filter-body are locked together, means for rotating the filter-body, an auxiliary chamber located adjacent the main chamber and communicating therewith, and a grinding or securing device located in said auxiliary chamber.

6. The combination with a casing and a filter-body located therein, of a gear journaled in the casing and forming a seat for the filter-body, a connection between the filter-body and gear, whereby the said body rotates with the gear, a pinion engaging said gear, a shaft to which the pinion is made fast, said shaft protruding from the casing and arranged to be rotated, an auxiliary chamber located adjacent the main chamber and communicating therewith, and an adjustable grinding device located in the auxiliary chamber and arranged to be thrown against the surface of the revolvable filter-body.

7. The combination with a casing, of a cylindrical filter-body revolubly mounted therein, an auxiliary chamber located adjacent the main chamber of the casing and communicating therewith, a grinding or scouring device located in said auxiliary chamber and having its inner surface curved to conform to the curve of the filter-body, and a shaft passing through said auxiliary chamber and provided with crank-arms suitably connected with said grinding device.

8. The combination with a filter-body, of a casing inclosing the latter and provided with a channel formed below the bottom of the casing-chamber and continued up the side of the casing and communicating at its upper extremity with the casing-chamber, an inlet at the bottom of the casing communicating with said channel, and an outlet at the bottom of the casing communicating with the casing-chamber.

9. The combination with a filter-body, of a casing inclosing the latter, said casing being provided with a spiral channel surrounding the filter-body and having a passage formed below the bottom of the casing-chamber continued up the side of the casing and communicating at its upper extremity with the spiral channel, an inlet at the bottom of the casing communicating with said bottom passage, and an outlet at the bottom of the casing communicating with the spiral channel.

10. In a filtering apparatus, the combination with a casing, of a body of filtering material located therein, a space being left between the wall of the casing and the filter-body for the water to circulate, a filter-body, having a central, longitudinal opening, a pipe located in said opening and extending into the lower part thereof forming a guide for the filter-body, the pipe and filter being locked together whereby they will rotate in unison, a grinding device located adjacent the filter-body, and means for rotating the filter-body and pipe for grinding purposes.

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

HENRY A. WALKER.

Witnesses:

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