

No. 766,918.

PATENTED AUG. 9, 1904.

W. G. TOUSEY.
FILTER.

APPLICATION FILED JAN. 23, 1904.

NO MODEL.

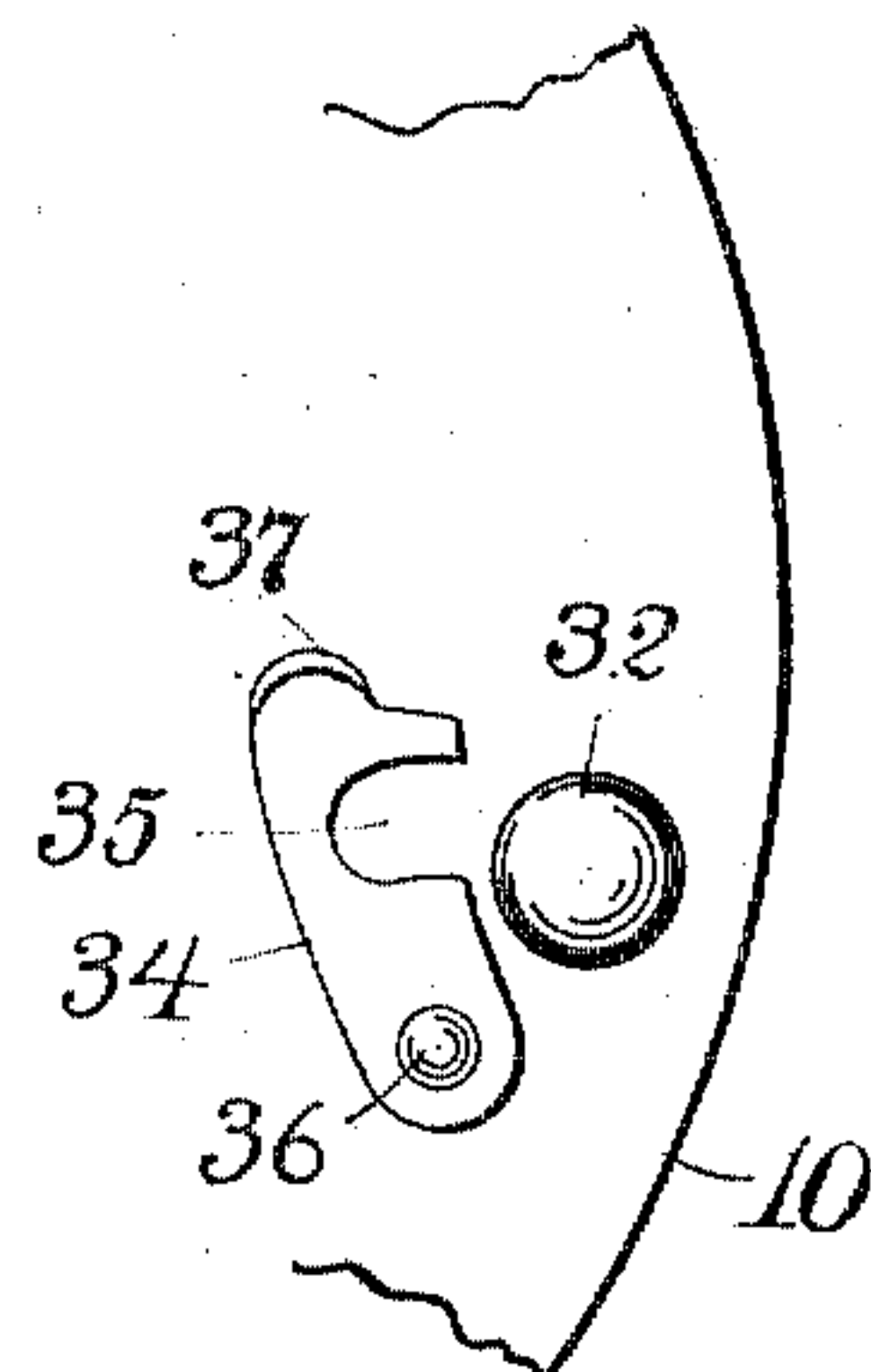
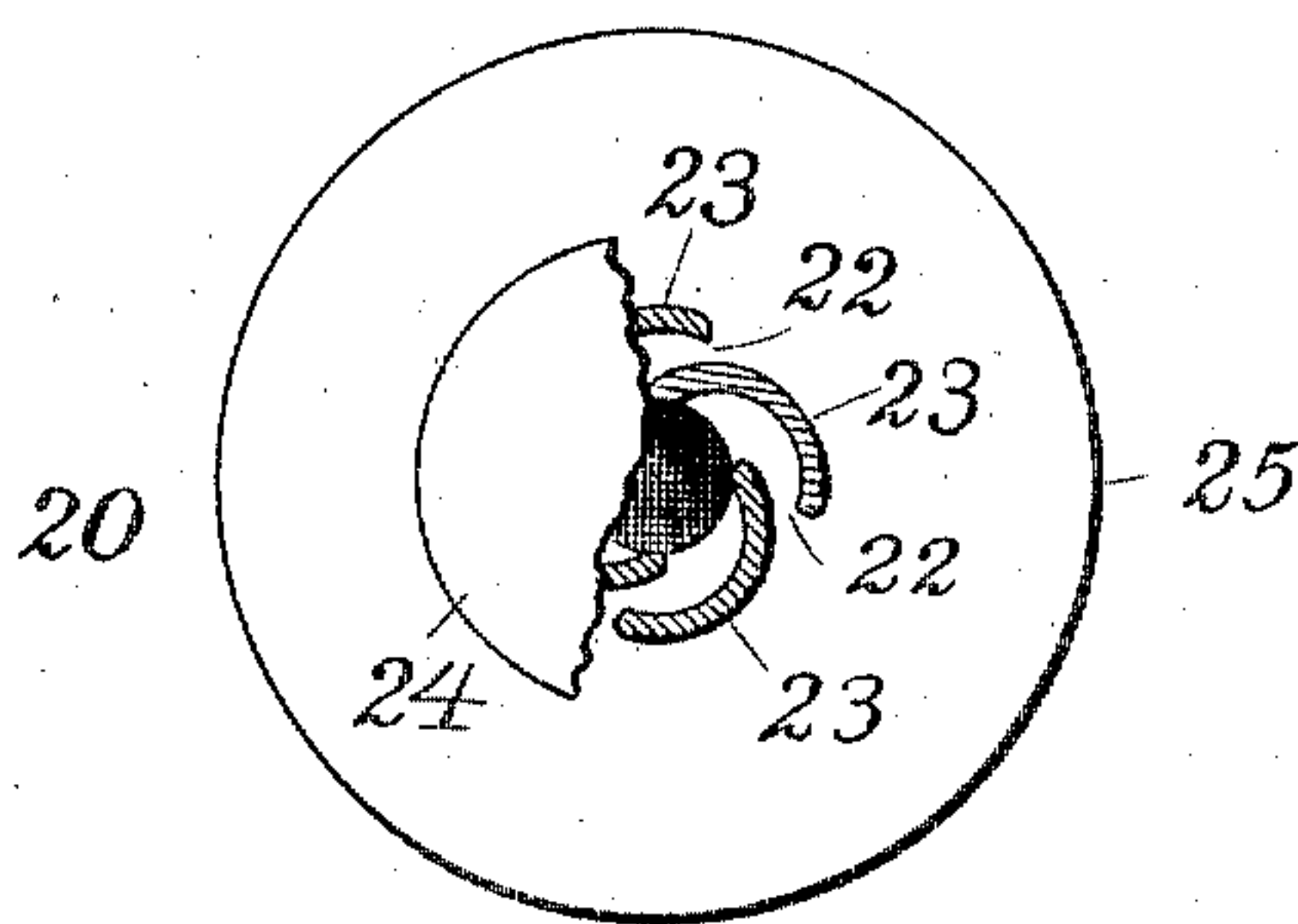
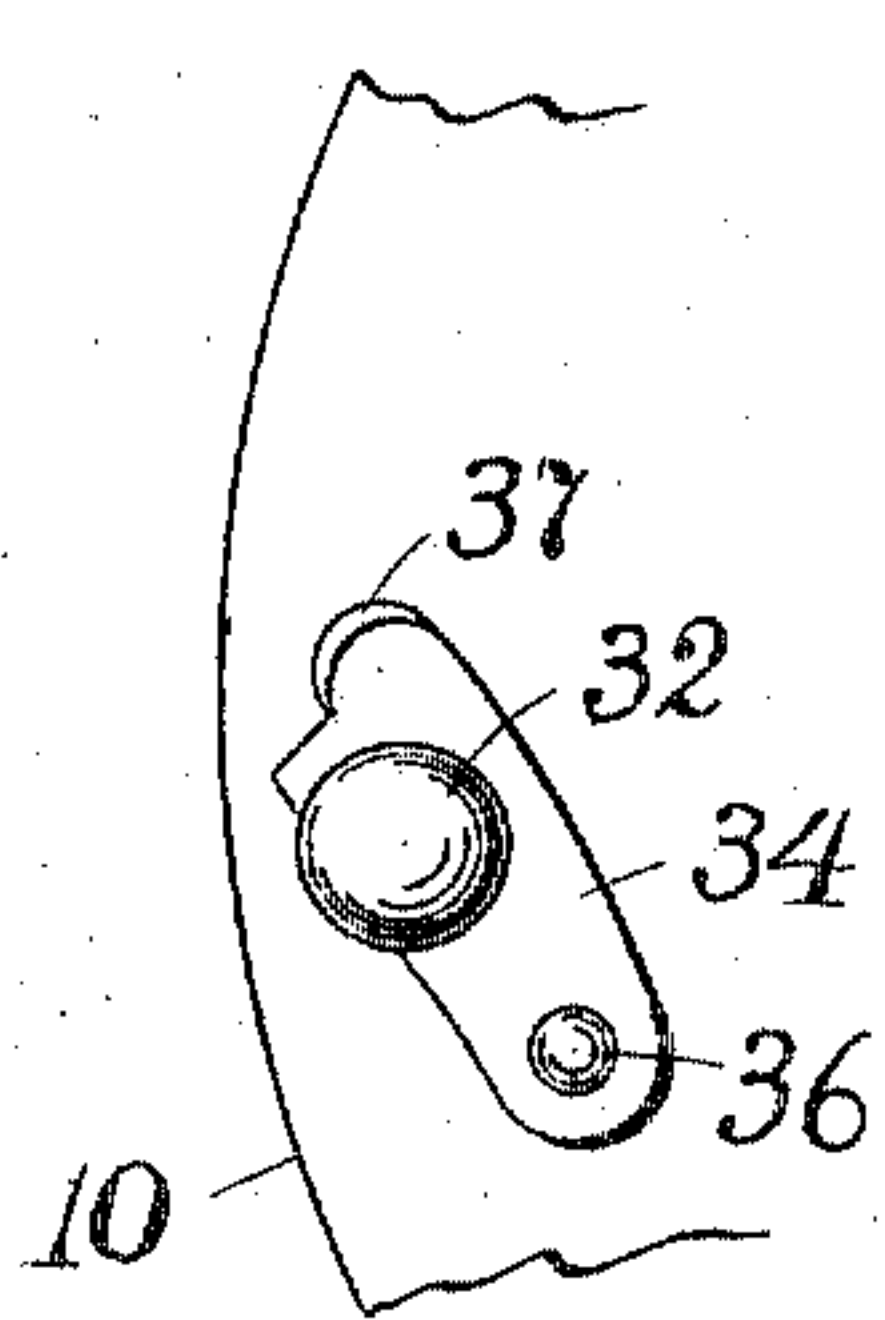
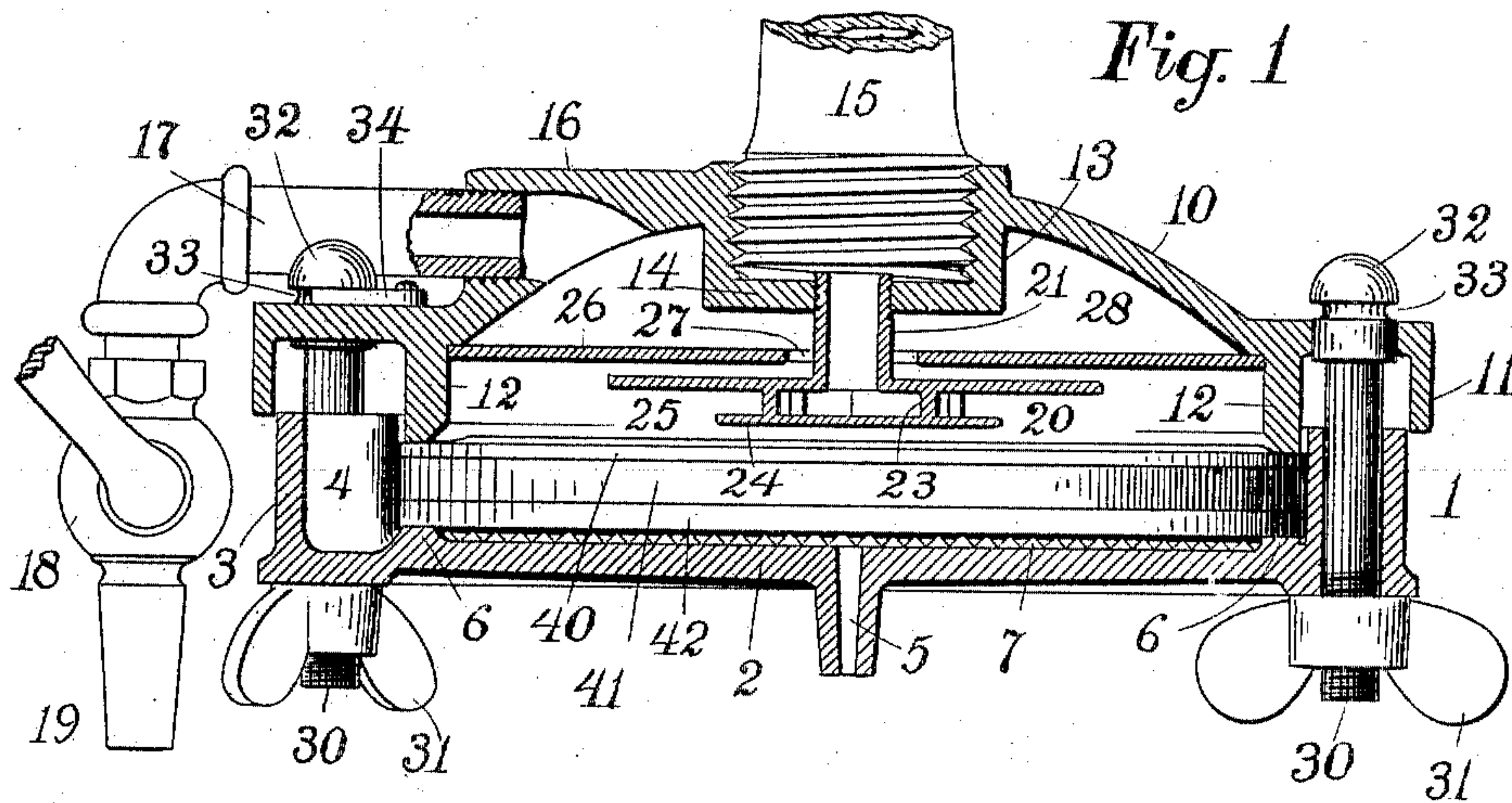


Fig. 4

Fig. 2

Fig. 5

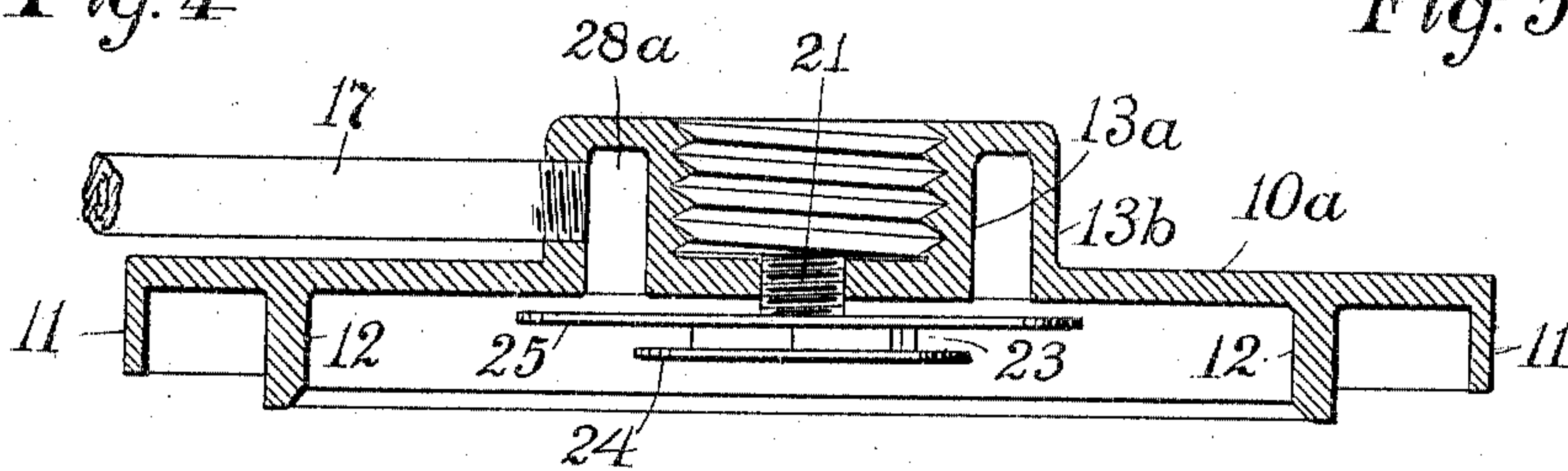


Fig. 3

Witnesses;

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His Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM G. TOUSEY, OF SOMERVILLE, MASSACHUSETTS.

FILTER.

SPECIFICATION forming part of Letters Patent No. 766,918, dated August 9, 1904.

Application filed January 23, 1904. Serial No. 190,272. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM G. TOUSEY, a citizen of the United States, and a resident of Somerville, in the county of Middlesex, State of Massachusetts, have invented certain new and useful Improvements in Filters, of which the following is a full, clear, and exact description.

Referring to the drawings forming part of this specification, Figure 1 is a central vertical section of my filter complete. Fig. 2 is an under view with part thereof broken away of the device, by means of which a swirling motion is given to the water entering the filter. Fig. 3 is a central vertical section of a modified form of the filter-cover. Fig. 4 is a detail view of one of the fastening devices for removably securing the cover upon the filter-body. Fig. 5 is a view of one of the same unfastened.

The filter-body 1 of my filter comprises the bottom 2, annular rim 3, annular ledge 6 for the support of the filter-tablets, the remainder of the upper face of said bottom being formed with corrugations 7, and an outlet 5 for the filtered water. Seated on the corrugated bottom 2 is the filtering element consisting of two porous filter-tablets 40 42, separated by the disk 41 in accordance with my patent dated October 10, 1899, No. 634,512.

The cover 10 is formed with a rim 11, loosely fitting about the rim 3 of the filter-body, and an internally-threaded socket 13, fitted to the threaded extremity of a faucet 15. Within said cover is an internal flange 12, seated upon the edge of the filter-tablet 40 and clamping the parts 40 41 42 between the same and the ledge 6. The clamping pressure is applied by means of the bolts 30 and thumb-nuts 31, said bolts being constructed with heads 32, which slip freely through openings made therefor in the cover, but to be held therein when desired by means of the clips 34, made to engage the grooves 33 in said heads. These clips are pivoted at 36 to the cover, are formed with the notch 35 for engaging the grooves 33, and are each provided with an ear 37, by means of which they may be operated.

The water-inlet consists of the short tube 21, tapped into the bottom 14 of the socket

13 and terminating at its lower end in a device for giving a rotary and swirling motion to the body of water flowing therefrom over the surface of the filtering medium. This device 20 comprises the plate 24 and the shield 25, held together by the curved elements 23, arranged to constitute the tangential openings 22, as shown in Fig. 2.

A short distance above the shield 25 is the diaphragm 26, fixed at its periphery to the flange 12 of the cover or top 10 and having a central opening 27 concentric with the tube 21. While this location of the opening or water-outlet 27 is preferable, because producing a more perfect whirling and scouring action of the water when the cock 18 is opened, yet I do not restrict myself thereto, the only essential point being that said opening shall be within the periphery of the shield 25 and that the nearer the opening is to said periphery the narrower must the space between the shield and the diaphragm be made. In other words, when the outlet 27 is concentric with the tube 21 then it makes little difference how wide is the space between the shield and diaphragm, for the outflowing water will approach said opening equally in all directions; but if said opening or outlet is eccentric with the filter-chamber then must the space between the shield and diaphragm be so restricted in comparison with the outlet 27 that the water must enter said space at every point of the shield's periphery to equal the volume passing out through said outlet. This still maintains the uniform centripetal outgo of the water.

The cock 18 is provided with a nozzle 19 and is connected to the filter-top by the section of tubing 17 tapped into the boss 16. Ordinarily this cock is kept closed, its only object being to enable the unfiltered water to be drawn and incidentally to cause the water flowing in through the openings 22 to enter with such force as to acquire the circular and swirling motion which I have found to be so efficacious for cleansing the filter-surface.

Said openings 22 because of their eccentric location and consequent tangential character given by them to the issuing jets cause the inflowing water to meet the curved inner sur-

face of the flange 12 at an oblique angle therewith. This obliquity of impact, together with the inherent tendency of the tangential jets, causes the water to be thrown into an energetic whirl over the surface of the filtering medium, cleansing said surface of the accumulations due to the filtering action. I have found that this cleansing action is enhanced by giving a symmetrical whirl and true vortex motion to the body of water coursing over the filtered surface. This requires that the exit from the chamber shall be central and above the inlet. Inasmuch, however, as the inlet is also central the pipe 17 must be connected with a portion of the cover or top at one side of the faucet 15, and so the real point of outflow be eccentric to the filter-chamber. To render the same concentric is the reason for my interposition of the diaphragm 26 with its opening 27 already described, while the shield 25 serves to separate the superposed currents and prevents the outgoing current from interference with the vortex motion of the incoming water revolving over the filter-surface.

In the modification shown in Fig. 3 the diaphragm 26 is dispensed with and the shield 25 is set so close to the surface above it that the outgoing current is compelled to make its exit equally at all points of the periphery of the shield.

The top or cover 10 being held by the faucet 15 all that is needed to be done in order to open the filter and expose the filter-chamber is to loosen the thumb-nuts 31 and swing the clips 34 out of engagement with the notches 33 in the bolt-heads. The filter-body then is easily removed.

To keep the bolts 30 from turning when the thumb-nuts are being manipulated, I usually provide them with suitable projections, engaging recesses in the parts through which they pass.

What I claim as my invention, and for which I desire Letters Patent, is as follows:

1. A filter comprising in its construction, a chamber having a water-inlet centrally located, a flat filtering medium arranged horizontally beneath said inlet, an outlet through the roof of said chamber near the center thereof from which unfiltered water can be drawn, and means for directing the water horizontally over the flat filter-surface in a plurality of streams; such directing means being fixed

but coacting with the curved interior wall of the chamber to set up a whirling motion on the part of the water as it passes over the filter-surface.

2. A filter comprising in its construction a filter-chamber having a water-inlet centrally located, a flat, horizontal filtering medium beneath said inlet, an outlet through the roof of said chamber near the center thereof from which unfiltered water can be drawn, means for directing the water horizontally over the flat filter-surface and for setting up a whirling motion thereof, and a shield located parallel with the filter-surface between the said inlet and roof, and arranged to supply a vertically-restricted—but open for substantially all its periphery—escape for the water passing to said outlet.

3. A filter comprising in its construction a filter-chamber having a water-inlet centrally located through its roof, a flat horizontal filtering medium beneath said inlet, an outlet through the roof of said chamber from which unfiltered water can be drawn, a horizontal surface beneath said outlet, a horizontal circular shield located comparatively close beneath said horizontal surface, and means for delivering the water from said inlet in a plurality of horizontal eccentric streams over the filter-surface beneath said shield.

4. A filter having a filter-chamber provided with an inlet centrally located, a filtering medium, a device for throwing the incoming water into a whirling motion over the filter-surface, an outlet for the unfiltered water above the inlet, a diaphragm having a central opening or outlet above the inlet, and a circular shield between said inlet and outlet and parallel with the diaphragm.

5. A filter having a filter-chamber provided with a filtering medium therein, and an inlet comprising a vertical tube descending from the center of the filter-top and formed with two horizontal circular plates having the curved elements fixed between them to provide eccentric openings for the water-influx.

In testimony that I claim the foregoing invention I have hereunto set my hand this 21st day of January, 1904.

WILLIAM G. TOUSEY.

Witnesses:

A. UPHAM,
W. L. GOODRICH.