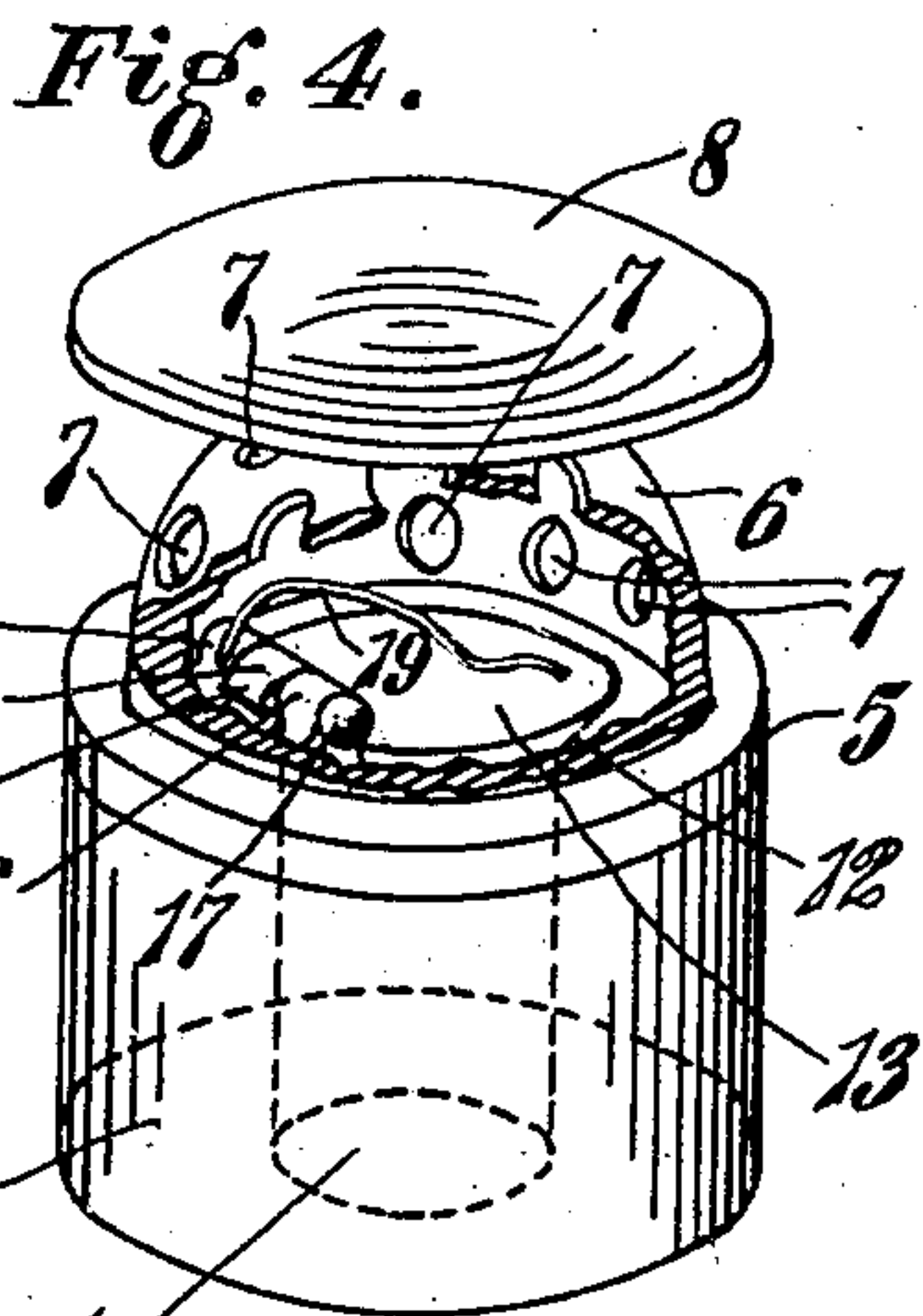
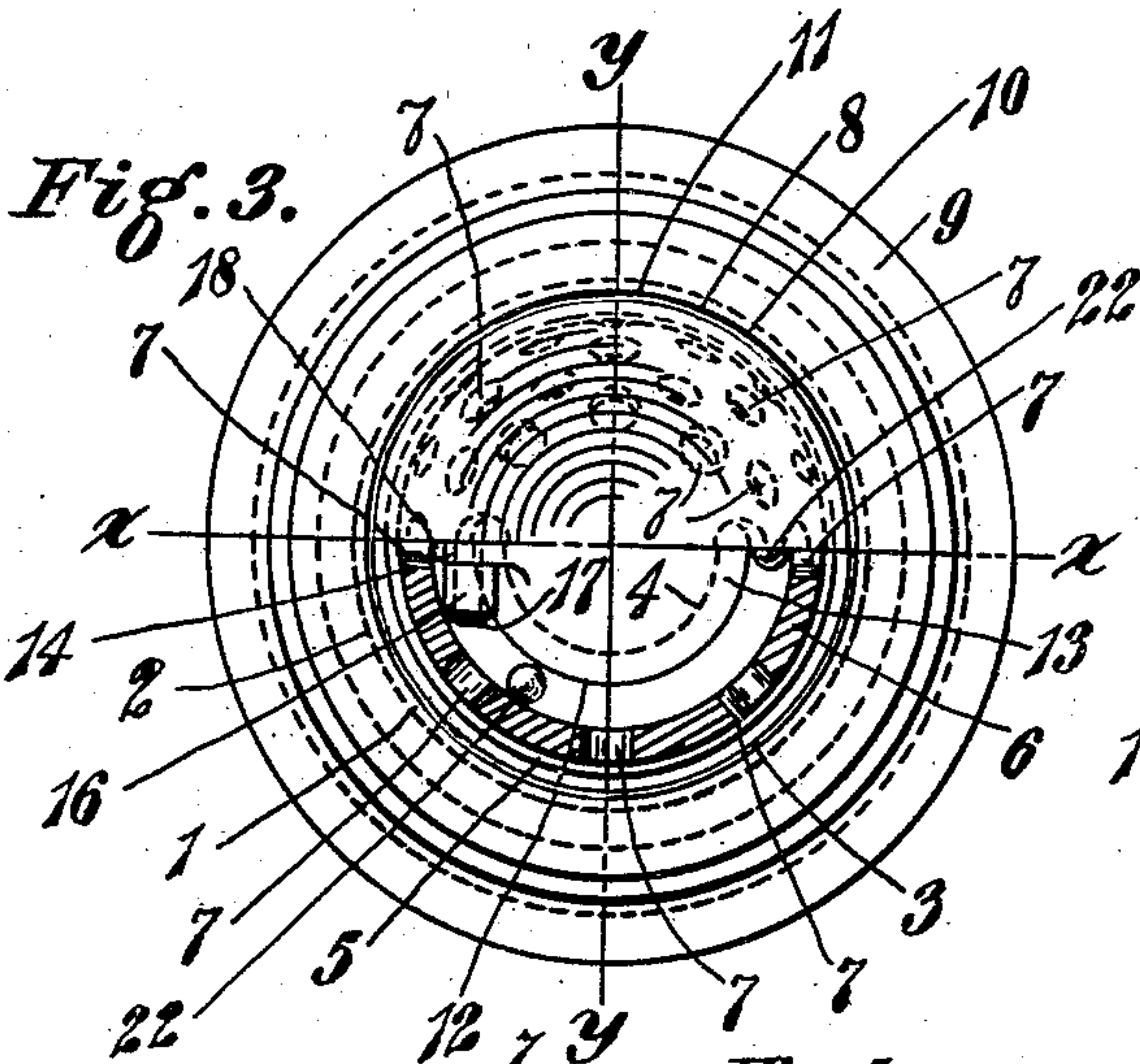
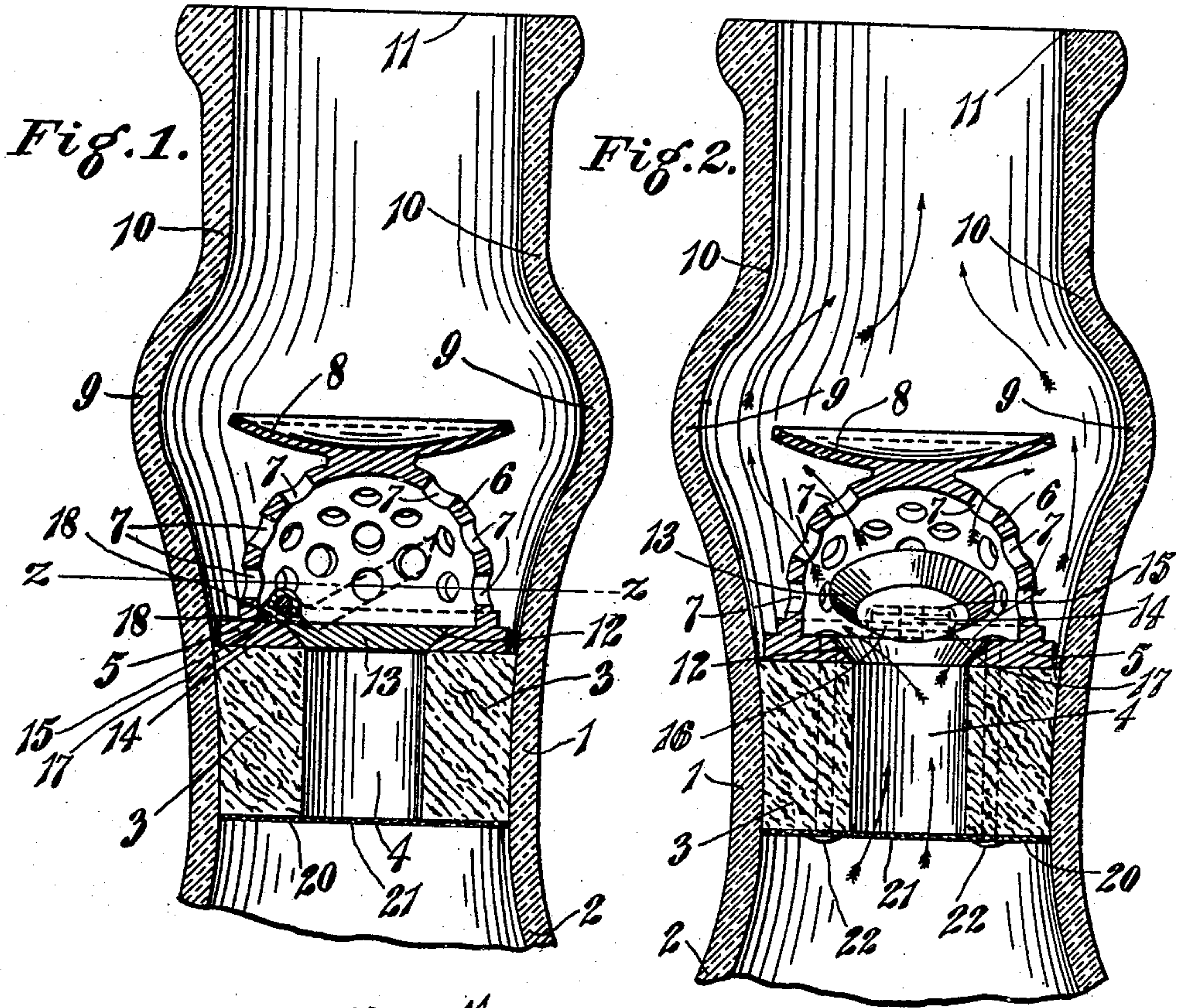


H. LOWENSTEIN.
NON-REFILLABLE BOTTLE.
APPLICATION FILED JAN. 11, 1908.

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Patented Dec. 29, 1908.



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HERMAN LOWENSTEIN, OF BELLEVUE, KENTUCKY.

NON-REFILLABLE BOTTLE.

No. 908,289.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HERMAN LOWENSTEIN, a citizen of the United States, and a resident of Bellevue, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Non-Refillable Bottles, of which the following is a specification.

My invention relates to non-refillable bottles, and the object is to produce a device of simple construction that will efficiently operate as a preventative against refilling of bottles without depending upon any detective feature, which necessitates the coöperation of the customer, in discouraging the substitution which it is designed to prevent.

My invention also has for its object the facilitation, by such simple and efficient preventative construction, of an unobstructed flow of the liquid from the bottle, practically equivalent in volume and continuity to the flow of liquid from a bottle in which such device is absent.

My invention consists in the combination with a bottle, the neck of which has an increased intermediate dimension and which is commonly known as a "choke-necked" bottle, of a plug of subereous material fitting into the neck of the bottle below the increased intermediate dimension thereof, and provided with an opening extending parallel with the length of the neck, together with a rigid, and for practical purposes, impenetrable valve supporting and covering structure, comprising a plate having a valve seat concentric to the opening through the plug and rigidly secured on the upper side of the plug, a substantially hemispherical cap rigidly secured to the plate and covering the valve seat, having radially extending perforations, and a disk having a regular contour and surface rigidly secured to the cap and at a tangent thereto and transversely of the neck in the region of its increased dimension, and a valve hinged to the plate, adapted to co-act with the valve seat therein and to be limited in its upward movement to allow the uninterrupted passage of the liquid without attaining a position that will prevent its ready return to its seat.

In the drawing, which serves to illustrate

my invention: Figure 1 is a section on a line corresponding to the line $x-x$ of Fig. 3 through the neck of a bottle, the valve being represented as in closed position. Fig. 2 is a section on a line corresponding to the line $y-y$ of Fig. 3, the valve, however, being shown in raised or open position and in full elevation. Fig. 3 is a plan view, one-half of the disk and perforated cap being broken away on a line corresponding to $z-z$ of Fig. 1. However, the construction illustrated in Fig. 3, as well as that illustrated in Fig. 2, differs slightly from that illustrated in Fig. 1, in that the plate which carries the valve seat and valve is represented as being riveted to the expansive plug, while in the construction illustrated in Fig. 1, the rivet fastening is absent. Fig. 4 is a detail perspective view of the expansive plug with the valve, perforated cap, and disk mounted thereon, part of the cap being broken away to more clearly disclose the valve, which valve is represented as being provided with a spring. The riveted fastening is also absent in the construction represented in Fig. 4. Fig. 5 is a detail view showing the hinge and lug in section on an enlarged scale.

As I prefer to embody my invention, the neck 1, which is represented as being broken away from the bottle in the region of its junction 2 therewith, has inserted and fitting tightly therein, the expansive plug 3 of cork or other subereous material, the neck 1 increasing slightly in diameter from the region of its junction 2 with the bottle towards its termination, and the expansive plug 3 being adapted to be forced into the tapering part of the neck thus formed so that it permanently occupies a relative position such as is illustrated in Figs. 1 and 2 of the drawing. This expansive plug 3 is provided with a central perforation 4 running parallel to the length of the neck of the bottle and of the proper diameter to form an outlet of sufficient capacity for the bottle, and on the upper side of the expansive plug 3, or its side toward the termination of the neck, a plate 5 is suitably rigidly mounted, which plate 5 carries, rigidly mounted upon it, the cap 6 of substantially hemispherical form, and provided with a series of perforations 7. This hemispherical perforated cap has rigidly attached to it the disk 8, which

is preferably concave on its upper surface, and essentially of regular contour and surface, so as not to present any recesses or engaging points that may co-act with an instrument inserted from the outside of the bottle to withdraw the device from the neck. This disk 8 is approximately tangent to the surface of the hemispherical cap, and occupies a position substantially at right angles to the length of the neck 1 of the bottle. From the region of the position occupied by the expansive plug 3, continuing toward its termination, the neck 1 of the bottle increases in diameter at a higher rate than it does adjacent to the expansive plug 3, so that, adjacent to the disk 8, the neck is of sufficiently enlarged dimension, as at 9, to allow the uninterrupted passage of the fluid around the disk, which disk is of diameter substantially the same as the diameter of the neck 1 in the region of the position of the expansive plug 3. Past the disk 8, continuing in the direction of the termination of the neck, the diameter of the neck decreases until it assumes, as at 10, a dimension only slightly larger than that of the diameter of the expansive plug 3 and of the disk 8. The neck 1 continues of this diameter to its termination 11.

The plate 5, which is rigidly mounted on the upper side of the expansive plug 3, is provided with a circular opening 12 concentric with the perforation 4 in the expansive plug 3, and forming a continuation thereto. On the lower side of the plate 5, this opening 12 is of the same diameter as that of the perforation 4, but increases in diameter at a suitable angle to form an upwardly facing valve seat, and a valve 13, fitted to this valve seat, is provided with a hinge member 14 which fits between two hinge members 15 and 16 on the plate 5 adjacent to the opening 12, and a pin 17 passes through the members 15, 14 and 16, thus hinging the valve 13 to the plate 5, the hinge thus constituted being so fitted relative to the valve seat formed by the opening 12, that the valve 13 will co-act therewith so as to effectually prevent the passage of fluid from above the expansive plug 3 into the bottle.

In order to limit the movement of the valve 13 upward, a lug 18 is provided on the hinge member 14, this lug being in such position that it will strike the plate 5 and prevent the valve 13 rising above the point where it could be made to remain open while holding the bottle in position allowing fluid to be poured into it. When desirable, a suitable spring such as the spring 19 shown in Fig. 4 of the drawing, may be applied to the valve to increase the certainty of the valve seating, and this spring should not be of greater strength than will allow the valve to open by its own weight when the bottle is tilted to position for pouring the fluid

therefrom. However, the weight of the valve 13 may be depended on to close it when the parts are properly proportioned, and I prefer to construct my improved device without the spring, according to the illustrations in Figs. 1, 2 and 3 of the drawing.

Another feature which I illustrate in the drawing in Figs. 1 and 2, but which may be dispensed with, is the screen 20 on the lower side of the expansive plug 3, which is adapted to permit the fluid to pass through its series of small perforations 21, but to prevent the passage of any matter contained in the fluid which might have a tendency to clog the operating parts of the valve 13. As illustrated in Figs. 2 and 3, and as hereinbefore referred to, the plate 5 is secured to the expansive plug 3 by means of rivets 22, the heads of which bear on the screen 21 below, and on the upper surface of the plate 5 above, thus securing the screen 22, as well as the plate 5 to the expansive plug 3. As illustrated in Figs. 1 and 4 of the drawing, the rivets 22 are not used, in which case the plate 5 would be secured to the expansive plug by means of cement or other suitable adhesive adapted to make a secure joint between the expansive plug 3 and the plate 5. In like manner would the screen 20 be secured to the expansive plug 3 in the construction illustrated in Fig. 1.

As illustrated in the drawing, the plate 5, hemispherical cap 6 and disk 8 constitute one solid piece, and concerning the principle of operation of my improved device, the best advantage will be attained by so forming these parts, but it will be understood that the three parts above mentioned may be separate pieces, so long as they are securely fastened together.

The valve 13, being within and covered by the hemispherical cap 6, the hemispherical cap 6 having the disk 8 interposed between it and the termination 11 of the neck, and this disk 8 being only of sufficiently less diameter than the opening of the neck 1 adjacent its termination 11, to allow the insertion of the disk, it will be seen that access to the valve 13 from the termination of the neck 1 is rendered impossible. Also the slight difference between the diameter of the outlet of the neck 1 and the diameter of the disk 8 is such that no instrument can bear operatively on the periphery of the disk 8 while it is being drawn through the outlet of the neck 1, thus rendering it impossible to draw the disk 8, together with the parts attached thereto, out of the neck by inserting any instrument and engaging under the disk 8. Such an undertaking is rendered far more difficult, owing to the fact that the expansive plug 3, forced into the tapering part of the neck 1, as illustrated in the drawing, becomes very difficult to with-

draw, so that it would be necessary to use an instrument of relatively large cross section to draw the disk and its attached parts from the neck. By constructing the expansive plug 3 of subereous material adapted to swell considerably when wet, such as cork, this plug will become more tightly fixed in the neck of the bottle in use, and thus increase the difficulty of withdrawing it therefrom. For this reason I prefer to construct the expansive plug 3 of cork, while the plate 5, cap 6 and disk 8, as well as the valve 13 are preferably constructed of a suitable metal the essential qualities of which are of sufficient hardness to preclude the possibility of forming engaging points on the surface of the disk 8, and sufficient tenacity to prevent fracture by means of any ordinary instrument such as may be in the hands of the unscrupulous dispenser.

From the foregoing description and from an inspection of the drawing, it will be seen that the withdrawal of the parts from the neck for unscrupulous use of the bottle after its contents have been emptied therefrom, is rendered impossible, and with the valve which I have disclosed, no fluid can enter the bottle after the parts have been properly placed in position in the neck. At the same time, the valve is readily operable to allow the outflow of the fluid, and the lug 18, so proportioned with respect to the hinge of the valve that merely by means of such a simple construction the valve is caused to effectually operate at all times, both in its function of opening to allow the uninterrupted flow of the liquid from the bottle, and in its function of readily seating and closing the bottle against the inflow of liquid, without the use of floats, weights, chains, guides and other details adding to the intricacy of construction, and consequently increasing the cost of producing such a device to the extent of rendering its use, on a large scale, prohibitive, and so complicating its operation as to render it unreliable in use. The use of the substantially hemispherical cap in conjunction with the substantially circular valve adapted to rise to the position to which it is limited by the lug 19, constitutes, when liquid is being withdrawn from the bottle, a most efficient passage for the liquid, forming such slight interruption to its flow that neither the volume nor the continuity of the stream is impaired. The radially extending perforations in the hemispherical cap, of such size and of such number as to render the hemispherical cap merely a network of supporting material over the valve to form a foundation for the smooth disk 8, are also particularly adapted to facilitate a copious and continuous flow of the liquid. Combining with the above features of construction, the ample annular space provided in the increased intermediate dimension of

the neck around the periphery of the disk 8, and relying on the smoothness, hardness and rigid mounting of the disk 8 to prevent tampering with the device, the provision of an undiminished and undivided flow of liquid from the neck is complete. Such undiminished and continuous flow of liquid from the bottle, and the ordinary and well known shape of the neck of the bottle are most highly advantageous, since it is undesirable that the customer who pours the liquid from the bottle should be imposed upon with any unfamiliar and disturbing device or manner of operation of the bottle, much less to be relied upon to inspect the interior of the neck of the bottle for the detection of any tampering therewith as evidenced by breakage or other mutilation of parts of the device therein. The accomplishment of such a result as will relieve the customer of any unusual experience in the use of the bottle, as well as avoid the reliance upon the customer for the detection of misuse, requires a device specifically of the herein described construction and of materials of the various characteristics herein specified, the material deviations from which will result in the failure of the operation of the apparatus to accomplish the object set forth and in the manner stated. It is known that a number of devices exhibit details of construction and materials having characteristics similar to those employed in my invention, but so materially different in combination and arrangement as to fail in accomplishing the result attained by my device.

In view of the above, what I claim as new and desire to secure by Letters Patent is:

In a non-refillable bottle, the combination with a neck of increased intermediate dimension, constituting said bottle what is commonly known as a "choke-necked" bottle, of a plug of subereous material adapted to expand to fit tightly in the neck between its greatest dimension and the body of the bottle when exposed to the action of the liquid in the bottle, and provided with a perforation extending parallel to the length of the neck, a plate rigidly mounted on the upper side of the plug and having a valve seat concentric with the perforation in the plug, a hinged valve adapted to co-act with the valve seat and allow the passage of fluid through the perforation and out of the bottle, but to prevent the passage of fluid into the bottle, a substantially hemispherical cap interposed between the valve and the increased dimension of the neck and rigidly secured to the plate, having radially extending perforations to allow the uninterrupted passage of the fluid, a lug on the hinged valve adapted to limit its upward movement to a position whereby it will allow the uninterrupted flow of the liquid from the bottle,

but whereby it will not be prevented from readily returning to its seat, a disk rigidly mounted on the cap at a tangent thereto and transversely of the neck in the region of its
5 increased dimension, the disk being of regular contour and surface, and of sufficient hardness to prevent the formation of

engaging points thereon, and of sufficient tenacity to resist fracture, as herein set forth.

HERMAN LOWENSTEIN.

Witnesses:

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JOSEPH LOWENSTEIN.