

No. 626,144.

Patented May 30, 1899.

F. L. COOK.
NON-REFILLABLE BOTTLE.

(Application filed Sept. 3, 1897.)

(No Model.)

Fig. 1.

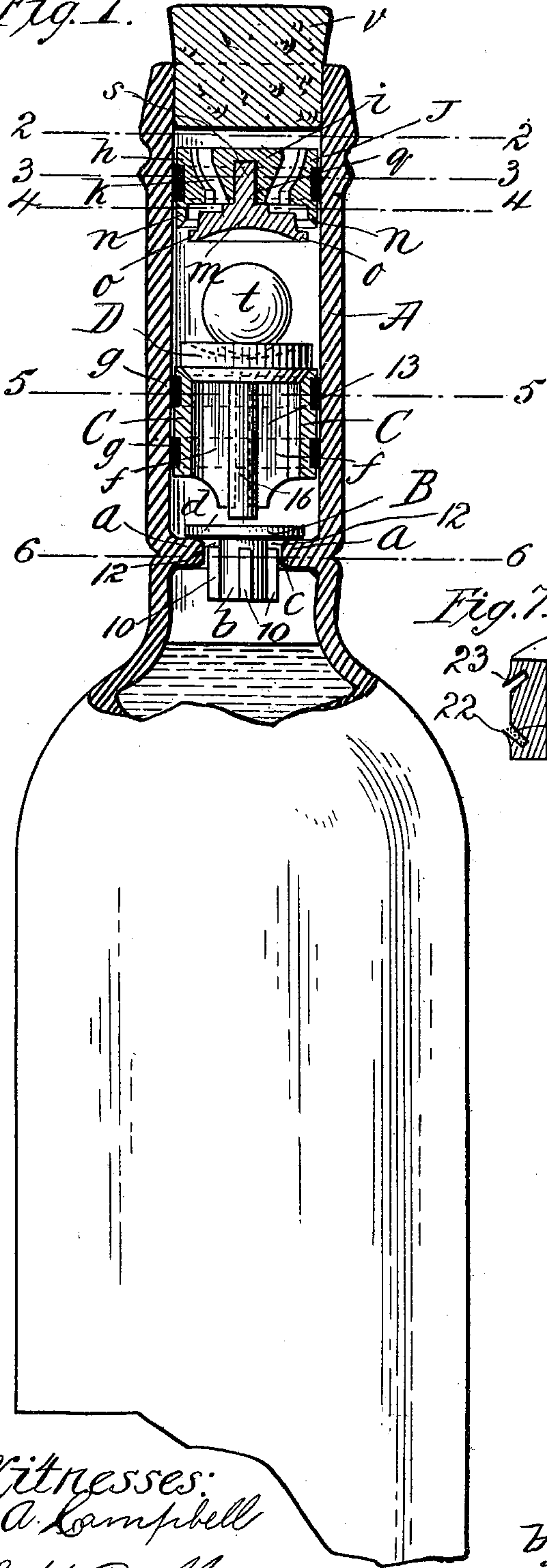


Fig. 2.

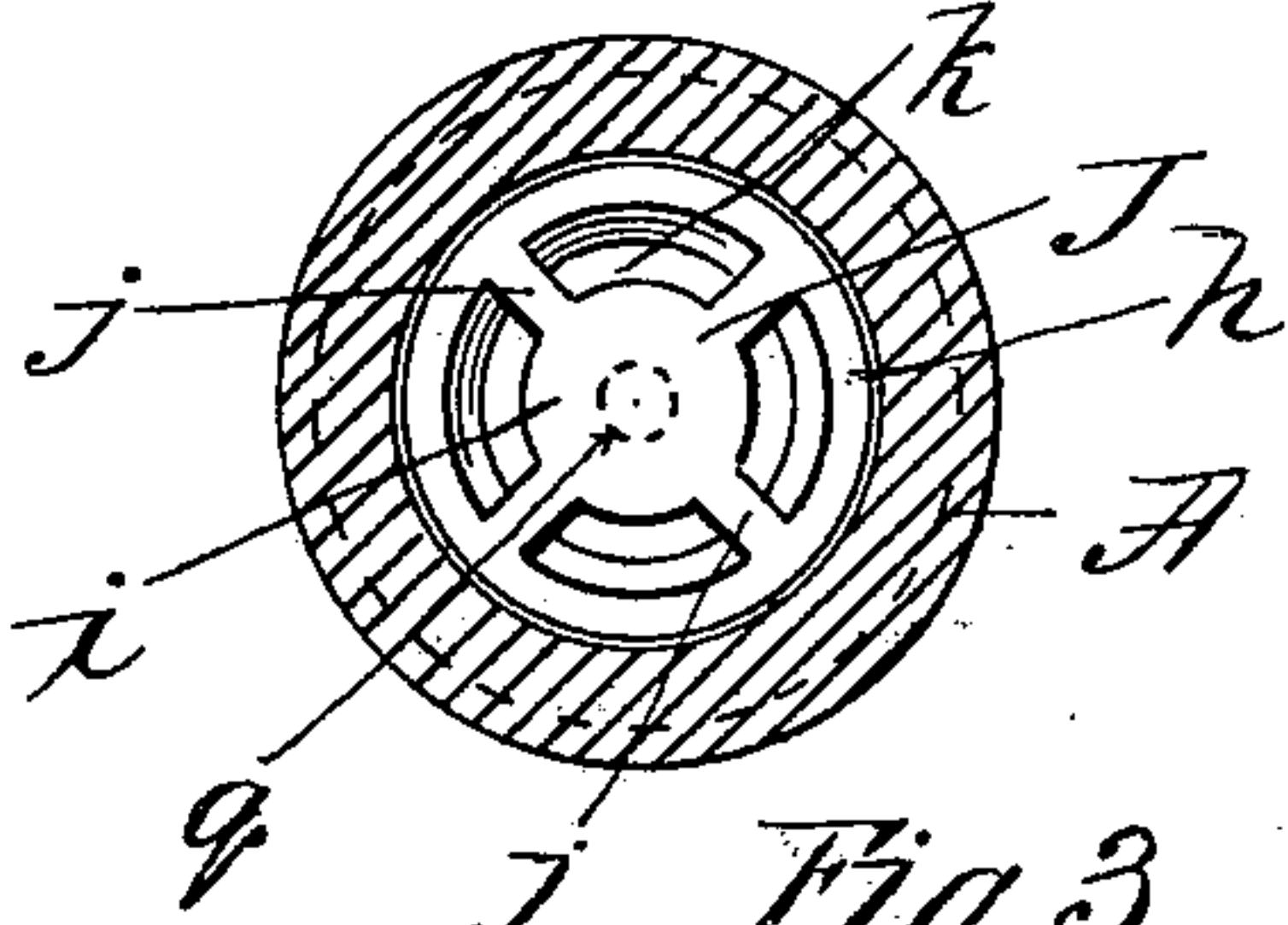


Fig. 3.

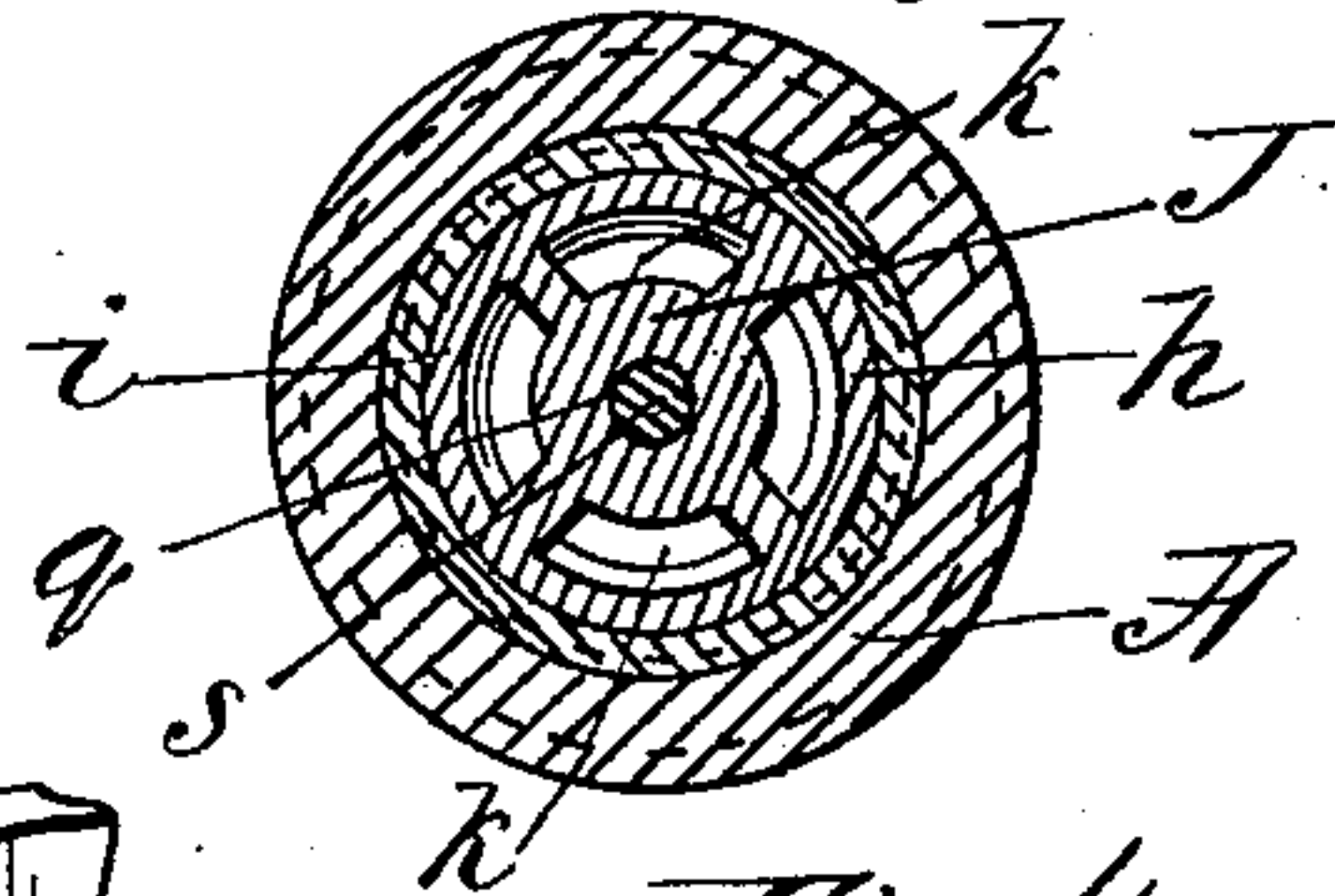


Fig. 4.

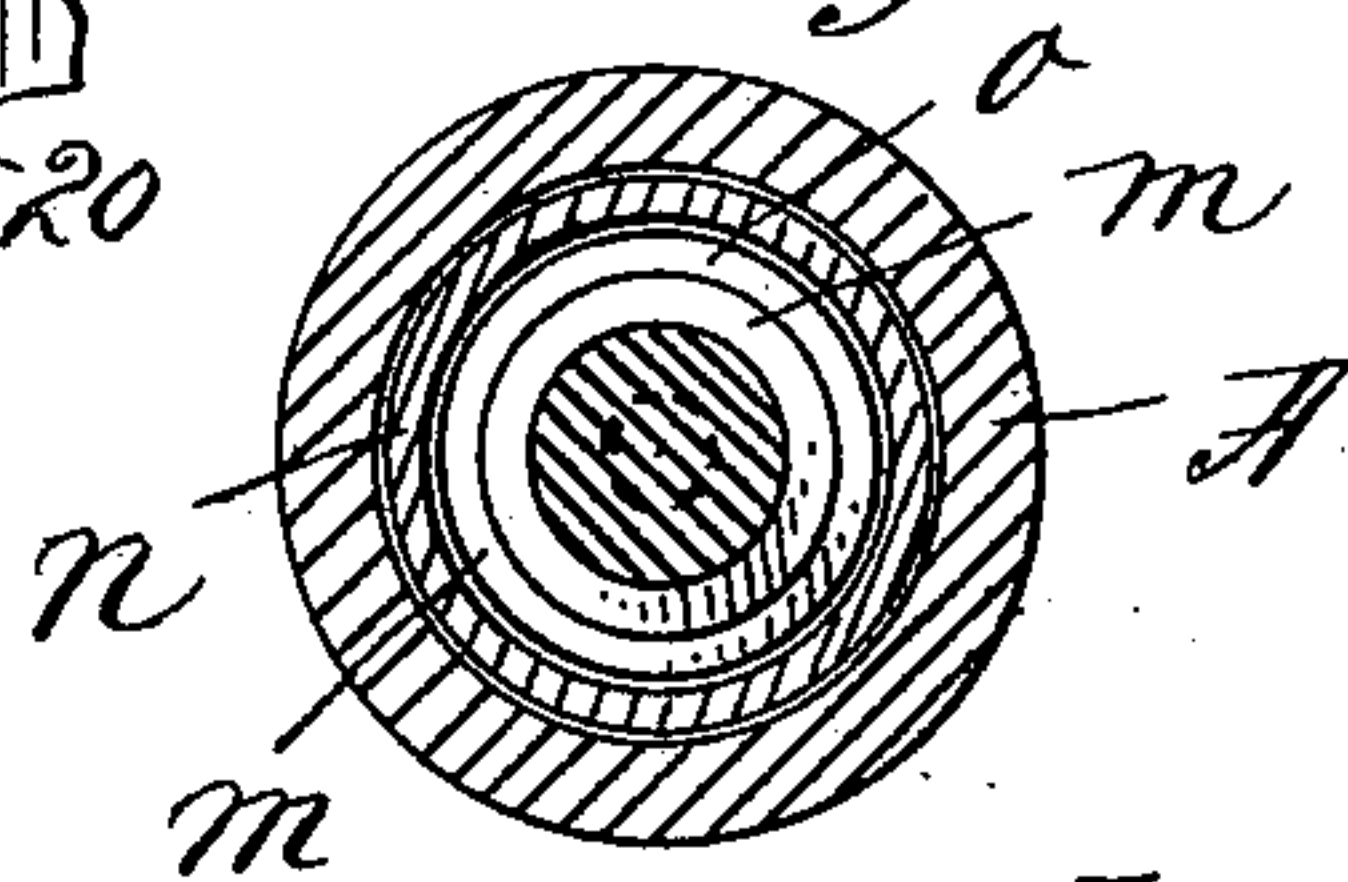


Fig. 5.

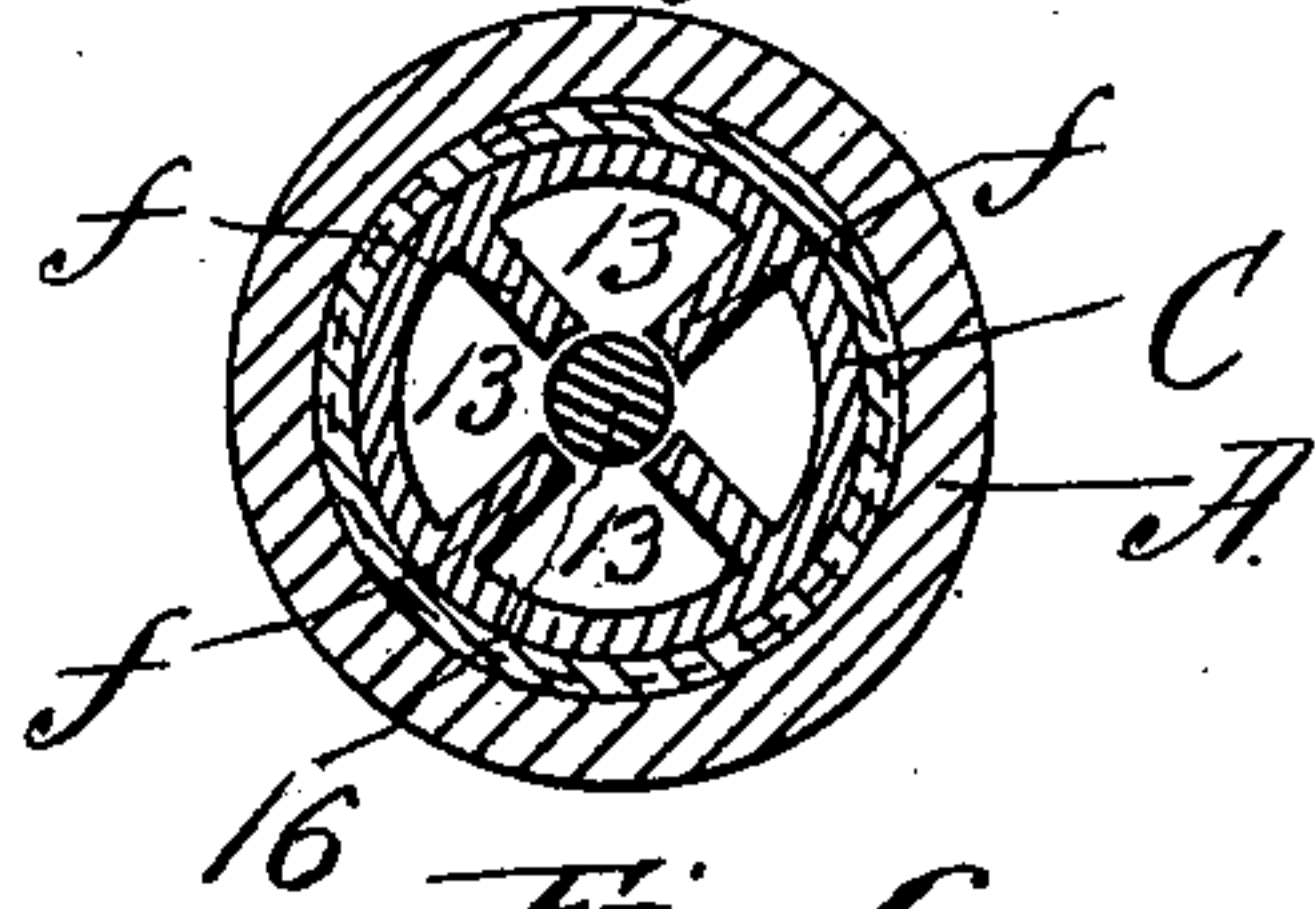


Fig. 6.

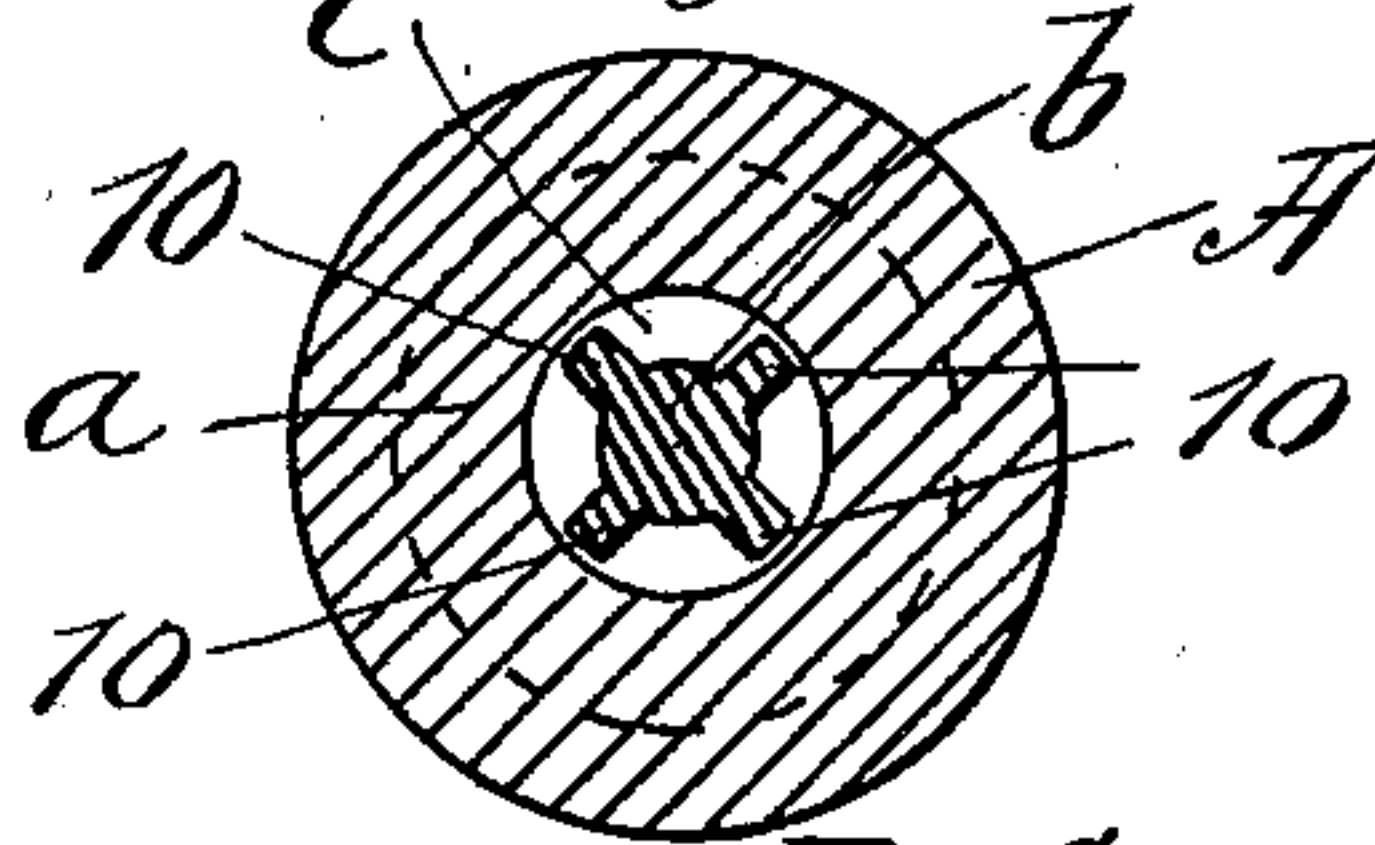
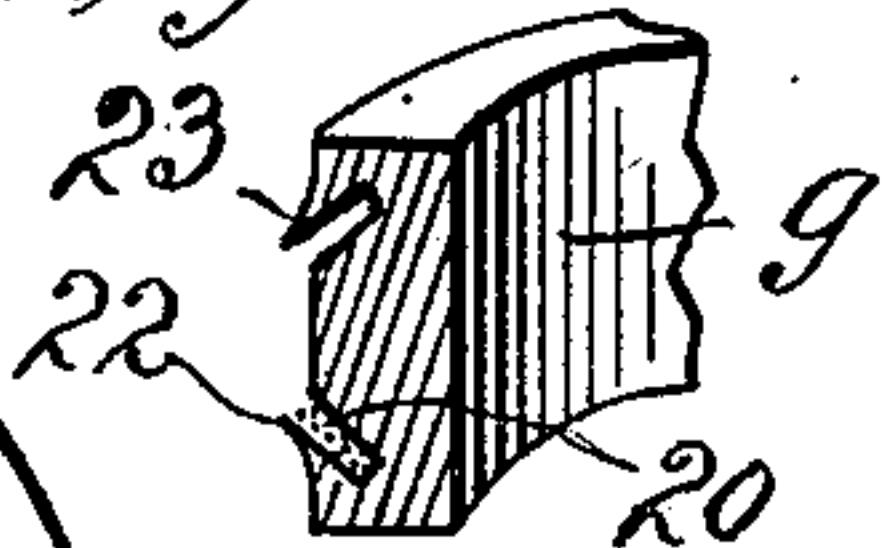


Fig. 7.



Witnesses:
M. A. Campbell
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Francis L. Cook,
Inventor,
by J. M. S. Bellows Atty.

UNITED STATES PATENT OFFICE.

FRANCIS L. COOK, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO ALFRED BIRNIE, OF SAME PLACE.

NON-REFILLABLE BOTTLE.

SPECIFICATION forming part of Letters Patent No. 626,144, dated May 30, 1899.

Application filed September 3, 1897. Serial No. 650,427. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS L. COOK, a citizen of the United States, and a resident of Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Non-Refillable Bottles, of which the following is a specification.

This invention relates to improvements in protection or safety bottles of the non-refillable class, the object being to produce means in the neck of the bottle for rendering the bottle absolutely non-refillable to any degree and under any conditions, it nevertheless affording a sufficiently copious outflow to meet all requirements.

The invention consists in the combination, with the neck of the bottle, of peculiar valve devices and safety appliances, all substantially as will hereinafter fully appear, and be set forth in the claims.

The improved bottle is illustrated in the accompanying drawings, in which—

Figure 1 is in substance a central vertical section of the bottle and the antifilling and safety appliances thereof. Figs. 2 to 6 are cross-sectional views taken on the section-lines on Fig. 1, numbered corresponding to the numerals of the respective figures. Fig. 7 is an enlarged perspective and sectional view of a detail of construction to be hereinafter referred to.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A represents the neck of the bottle, having well below its mouth the internal annular shoulder or valve-seat *a*, constituted integrally of the glass which forms the bottle.

B represents the lower valve comprised in the invention, the same consisting of a stem *b* and a piston-shaped head *d*, adapted to rest on the said annular valve-seat shoulder *a*, the stem depending loosely through the opening *c* within the valve-seat, and having the radial wings 10 10, which have a free sliding fit on and are guided by the inner circular edge of the valve-seat, and leaving a considerable liquid-space between the attenuated part of the stem intermediate of wings 10 and the margin of the valve-seat.

The wings 10 10 are not extended quite up to the under side of the head of the valve, but recesses 12 12 are formed, whereby increased space for outflow is acquired when the valve is moved from its seat.

Above the valve-seat and separated therefrom by a short distance is a cylindrical apertured partition, the same consisting of an annular body C, fitted and secured in the neck of the bottle and provided with the internal radial wings *ff*, three or four in number, their approached inner edges serving as a guide to the stem of the upper valve D, it being noted that through this partition from end to end vertically are recesses or passages 13 of considerable cross-sectional area, and the said wings *ff* are extended a little below the lower end of the apertured partition C, terminating at a suitable distance above the top of the lower valve and serving as a stop therefor, whereby said lower valve may not close against and obstruct the liquid-passage for exit through the valved apertured partition.

The upper valve D has a piston-shaped head and round attenuated cylindrical stem 16 and closes against the top of the said apertured partition, closing the vertical apertures or passages 13, its stem being extended downwardly to or very near to the top of the lower valve B. The said partition C is externally peripherally grooved or channeled, receiving therein a packing-band *g* of compressible material, preferably cork, the partition with this packing material being held in its place in the neck of the bottle by cementing. As shown in Fig. 7, this compressible material is channeled around its exterior surface in an inclining direction, as indicated at 20 in Fig. 7, receiving in this channel a quantity of cement preparatory to entering the said part C into the neck of the bottle, the compression or closing of the lip 22 as the partition is brought to place causing the cement to exude and cover the interior of the bottle-neck and to adhere both to the latter and to the periphery of the packing. I also prefer to provide a second lip 23 by channeling the reverse of the lip 22, this lip serving as a wiper member of the cork packing to drag, so to speak, such of the cement as may

have been squeezed out from the lip 20 upon the upper portion of the surface of the bottle-neck downwardly, maintaining the major portion of its cement so discharged from the packing for the adhesion between the part C and the portion of the bottle-neck within which it is located.

J represents a guard located and secured in the neck of the bottle above the upper valve, the same being constructed in such a way that while it in no way obstructs the ample freedom of the outflow of the liquid from the bottom it will defeat any attempt to tamper with the valve by the insertion of a wire or other small instrument. This guard consists of a cylindrical annular body fitted, packed, and cemented in the neck of the bottle, the said annular body being represented by the letter *h*, it having located therewithin concentrically a smaller circular body or core *i*, which is supported by the integrally-formed radial arms *j*, the spaces or apertures *k* between the inner and outer circular portions *i* *h* being downwardly and inwardly deflected, as shown in the section Fig. 1, and the central portion or body *i* has the flange enlargement *m* depending therebelow, which is exteriorly of double-step shape, being widely surrounded by the depending annular flange *n* at the lower end of the outer annular body *h* aforesaid, and the said depending flange *m* has the outwardly-extended peripheral rib *o* below and extending toward said flange *n*. In constructing this guard of glass or porcelain the central portion *i* is formed with a circular hole or socket *q*, opening at its lower end, while the depending double-step-formed flange *m* has the upstanding stem *s*, which is fitted and fused or cemented in said socket, whereby when the parts are assembled and united the peculiarly-formed guard is the same as an integral appliance. It will be perceived on reference to the drawings that the outflow-passage through the said guard J, while ample and free for the passage of the liquid, is so tortuous that it will be impossible for the insertion through and below it of any wire, for the downward and inward direction of the openings *k* will tend to guide the wire toward near the central portion of the guard-flange *m*, which will obstruct its further entrance, the passage taking at this place first a sharp or acute angular direction outwardly, then vertically downward, and then a downward and outward direction, the lower mouth of the passage being adjacent the internal wall of the bottle-neck, which were it possible to pass the end of a wire thus far would serve as a further barrier to its insertion. A sufficient space is left between the guard device and the upper valve somewhat greater than the diameter of the ball which is interposed therebetween and designated by *t*, the utility of which is to by its weight assist in the maintenance of the upper valve in its closed position when the bottle is up-

right. While this ball is employed by preference, it is not regarded as an essential in the present invention and is not to be regarded in any sense as a valve. It is designed that all of the devices will be constructed of a hard non-corrosive material, such as glass, porcelain, vulcanized fiber, or vulcanite.

When the bottle is inverted after it has been filled and the non-refillable appliances have been introduced into their positions shown and the outer stopper *v* removed, the pressure of the liquid and the gravity of the lower valve cause the lower valve to move open from its seat, the liquid passing through the valve-seat opening as permitted by the spaces between the radial wings 10 10 of the lower-valve stem. The opening movement of the lower valve pressing against the depending stem of the upper valve causes the latter to be also moved away from the upper end of the apertured partition C, leaving the liquid free to pass through the passages 13 between the internal radial wings or ribs *f*, which serve as guides to the valve-stem, the passage of the liquid through the guard and through the mouth of the bottle-neck being unobstructed. Immediately the bottle is brought to or nearly to the upright position the valves both automatically close.

It is obvious from an inspection of the drawings that any attempt to force any considerable quantity of liquid into the bottle through the neck will be fruitless, and it will be further stated that I have actually constructed and put into successful operation a non-refillable bottle of which the accompanying drawings are an accurate representation, and I have subjected the bottle to the severest tests known in respect to bottles of this class for the purpose of ascertaining if it were possible by the introduction of small quantities of liquid into the neck and by the use of pressure to cause a rising of the valves from their seats and the passage past the valves of the smallest quantity of the liquid imaginable, and it has always been found impossible to introduce any liquid into the bottle through the valve devices.

I claim—

1. In a non-refillable bottle, the combination with the bottle-neck having the internal annular valve-seat *a*, of the valve B consisting of the head *d* and the stem provided with the radial wings 10, the edges of which are guided by the margin of the valve-seat, the apertured partition C located above the valve B and comprising the annular body having the radially inwardly extended wings or ribs *f* *f* which are also extended downwardly below the end of the said apertured partition and constitute a stop for preventing the lower valve in opening from its seat closing the apertures through said partition and the valve D having its stem projected through and below and guided by the approached inner edges

of said ribs *f* and terminating in proximity to the upper end of the said valve B, substantially as described.

2. In a non-refillable bottle, the combination with a valve device in the bottle-neck, of a guard thereabove consisting of annular outer body *h* and circular inner body *i* and the uniting radial separated arms *j* passages between the two bodies being downwardly and inwardly extending and the outer body having at its lower end the depending flange *n*, the said inner body *i* having depending therebelow the radially-extending flange *m* which is of double-step shape, substantially as described and shown.

3. In a non-refillable bottle, the combination with a non-refilling valve device in the bottle-neck, of the guard thereabove consisting of annular body *h* having at its lower end near its outer periphery the depending flange *n*, and the inner circular body *i* united by the radial arms *j*, said body *i* having the socket *q* opening to its lower end and the stem *s* secured in said socket and having the circular flange *m* at its lower end, substantially as described and shown.

4. In a non-refillable bottle, the combination with the bottle-neck, of a cylindrical par-

tion or plug, as C having a peripheral groove, an annular section of compressible material located in the peripheral groove and having an inclined channel or incision within its outer surface in which is a quantity of cement, all adapted for the discharge of the cement upon the bottle-neck surface as the said partition or plug-like part is forced to place therewithin, substantially as and for the purpose explained.

5. In a non-refillable bottle, the combination with the bottle-neck, of a plug-like part to be fitted therein, as a partition or a guard which is exteriorly peripherally grooved and having in said groove an annular section of compressible material which has an inclined incision or channel 20 for receiving cement therein and a second incision producing the lip or wiper 23, substantially as described and shown and for the purposes explained.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 30th day of August, 1897.

FRANCIS L. COOK.

Witnesses:

WM. S. BELLOWS,
M. A. CAMPBELL.