

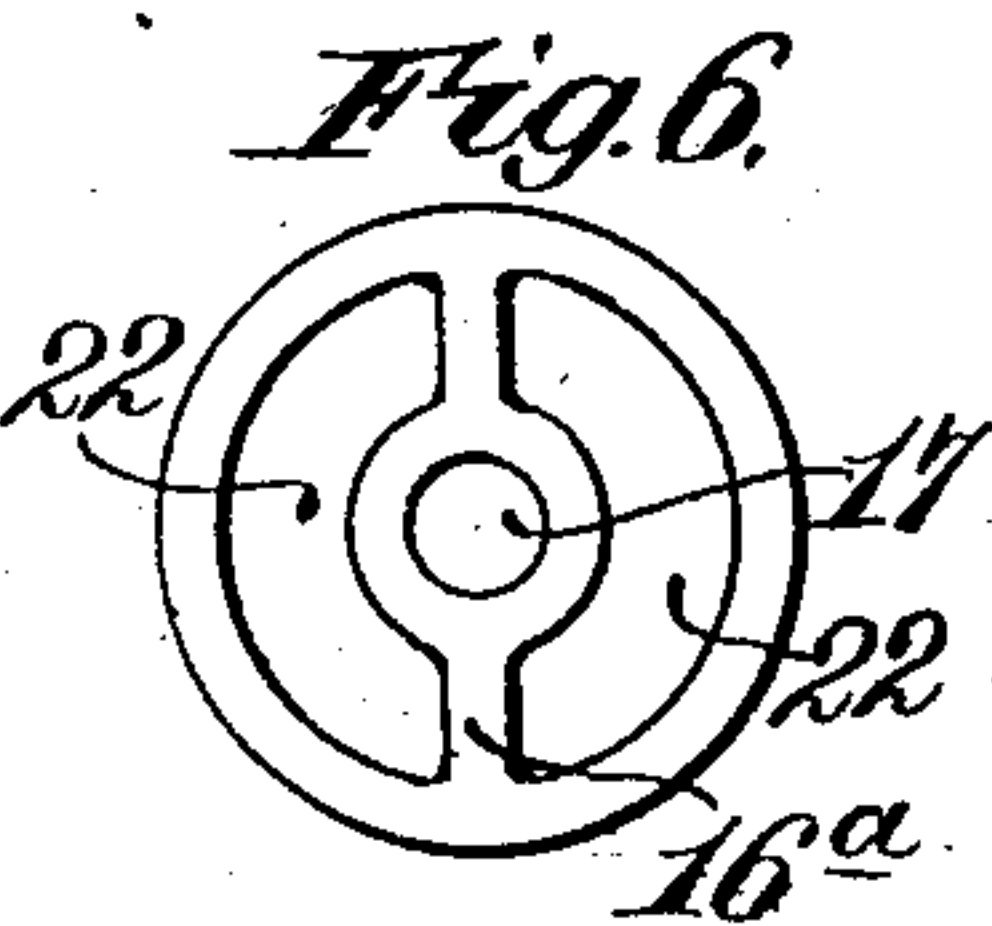
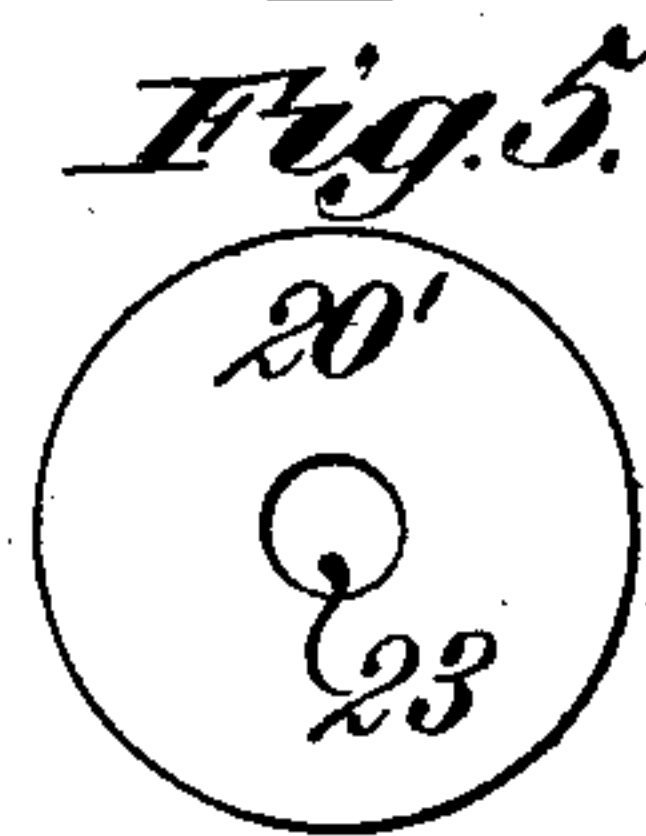
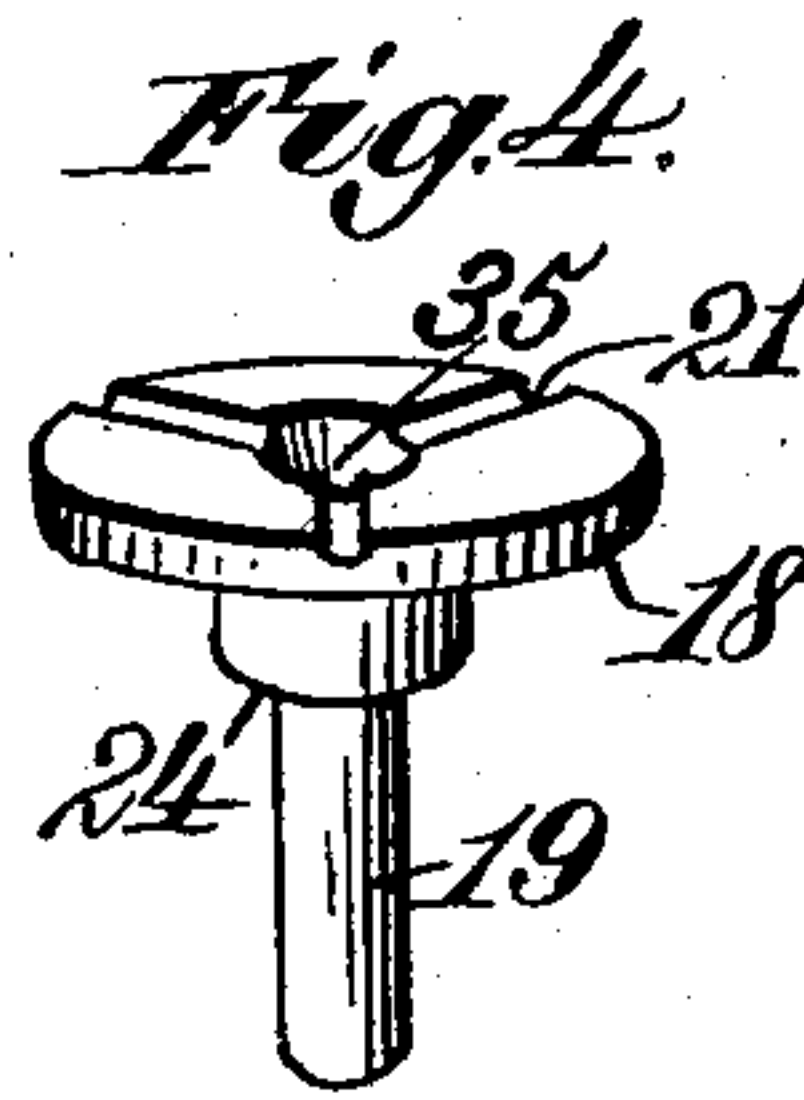
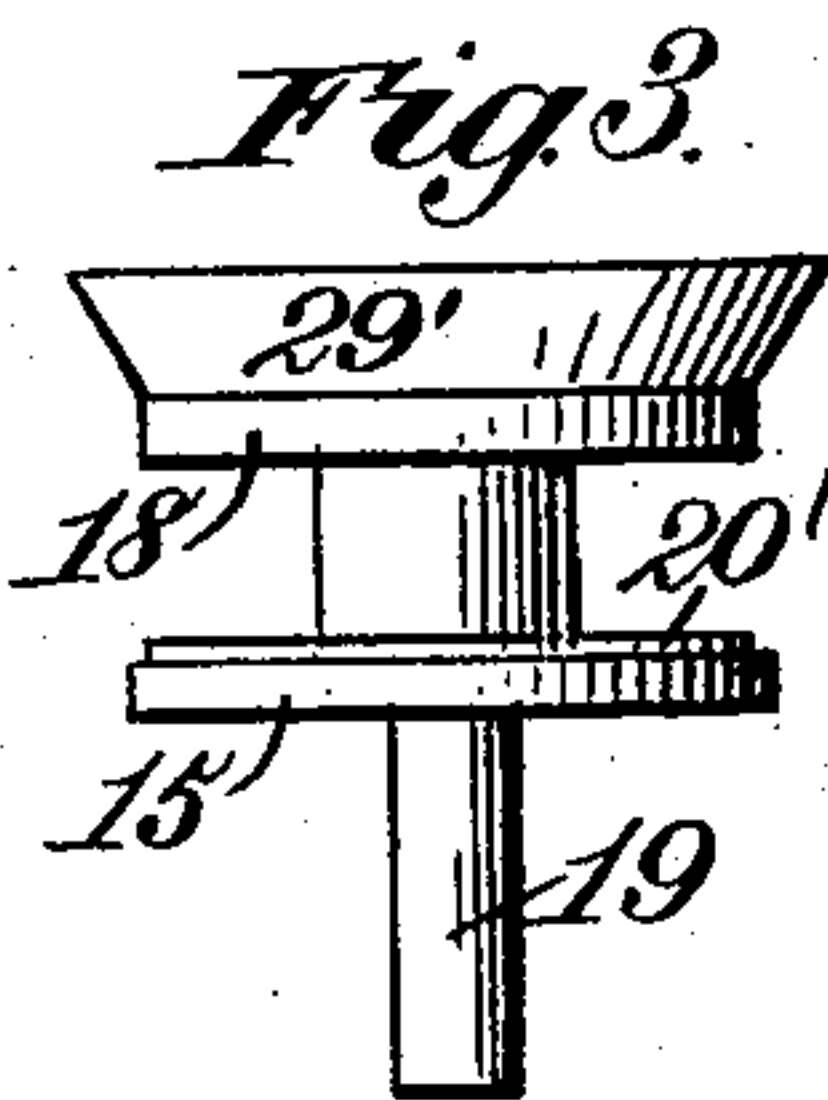
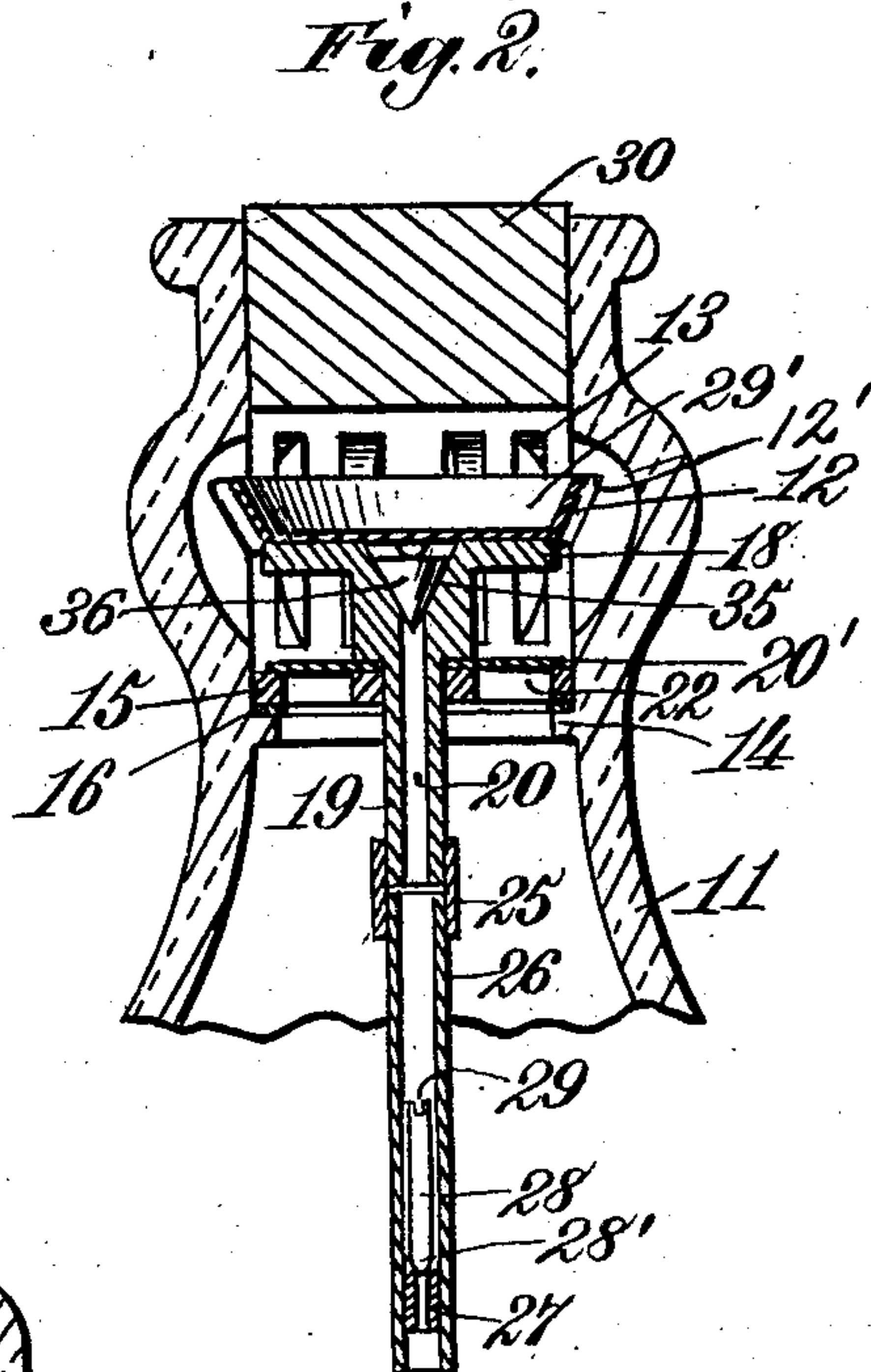
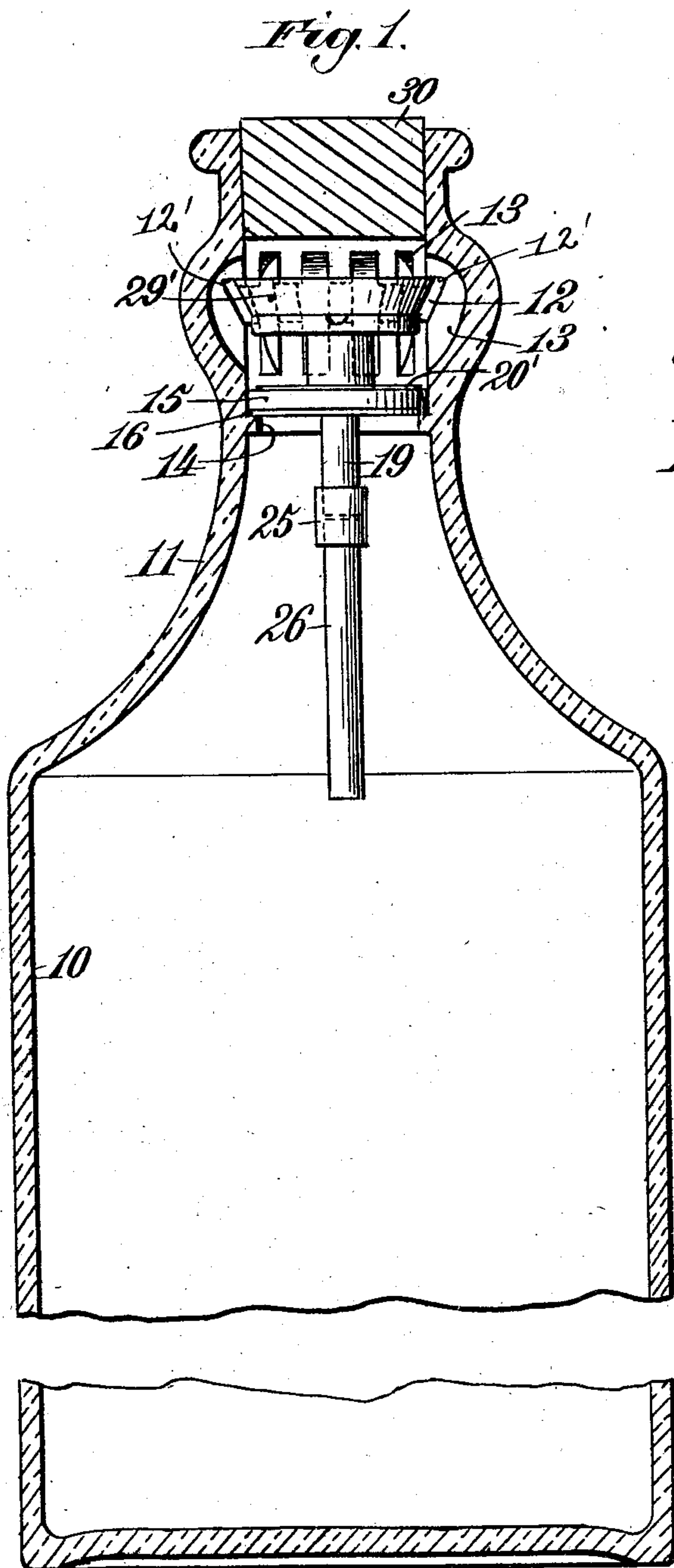
No. 724,958.

PATENTED APR. 7, 1903.

E. C. SHILLING.  
NON-REFILLABLE BOTTLE.

APPLICATION FILED JUNE 4, 1902.

NO MODEL.



Witnesses.  
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Inventor.  
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By *James L. Norris,*  
*Att'y.*



# UNITED STATES PATENT OFFICE.

EDWARD C. SHILLING, OF COLUMBUS, OHIO.

## NON-REFILLABLE BOTTLE.

SPECIFICATION forming part of Letters Patent No. 724,958, dated April 7, 1903.

Application filed June 4, 1902. Serial No. 110,224. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD C. SHILLING, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented new and useful Improvements in Non-Refillable Bottles, of which the following is a specification.

This invention relates to non-refillable bottles; and the object of the invention is to provide an article of this kind from which the contents can readily be poured, no matter in what way the bottle may be tilted, while the unauthorized refilling of the same after the original contents have been withdrawn is not possible, and the improved bottle is simple and thoroughly effective for the purpose intended and can be inexpensively made.

Other objects and advantages of the invention will be set forth in the following description, while the novelty thereof will form the basis of the claims succeeding said description, and said invention is clearly illustrated in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a vertical central sectional view of a bottle including my improvements. Fig. 2 is a similar view of the neck of the bottle and inclosed parts on a slightly-larger scale. Fig. 3 is a detail view of a cage and certain parts connected therewith. Fig. 4 is a similar view of the upper disk of the cage and its depending stem. Fig. 5 is a plan view of the valve controlling the discharge of the liquid. Fig. 6 is a similar view of the lower part of the cage. Fig. 7 is a cross-section taken through the lower portion of the vent-tube and on an enlarged scale.

Like characters refer to like parts in all the figures of the drawings.

In Fig. 1 I have shown a bottle, the same being denoted by 10, and it may be made of glass or any other suitable material, and its body may be of the usual shape.

The neck 11 of the bottle is provided interiorly with an annular horizontal groove 12, which terminates at its upper end in an abrupt shoulder 12' and is intersected at suitable points by the vertical grooves 13 of any desirable number. The grooves 13 are deeper than the annular groove 12 and serve as ducts for the passage of the liquid contents of the bottle, as will hereinafter be set forth. The

neck is provided interiorly thereof, below the lower ends of the vertical channels or passages 13, with an inwardly-disposed annular flange 14, constituting a suitable support for the ring 15, a washer 16 being interposed between said ring and annular flange and being made of any suitable material. Said ring is provided with a cross-bar 16<sup>a</sup>, having a central perforation or aperture 17, the purpose of which will hereinafter appear. Within the neck 11, above the ring 15 and situated substantially midway of the length of the several channels 13, is a disk 18, from the under side of which the stem 19 extends, said stem projecting through the central perforation or aperture in the cross-bar 16<sup>a</sup>. The stem 19 is bored at 20 its entire length, and the upper end of the bore opens into the channels 21, formed on the upper face of the disk 18, substantially radially thereof. There are three of these channels or cuts 21 shown; but this number may of course be increased or diminished, if desired. The ring 15, which is closely fitted within the neck 11, constitutes a carrier for the valve 20', said valve being preferably made of sheet or thin rubber and being in the form of a disk. The diameter of the valve is slightly less than that of the ring 15, it being evident that the valve is adapted normally to cover the openings 22 at opposite sides of the cross-bar 16, said openings 22 being intended for the egress of the contents of the bottle when the same is tilted. The stem 19 of the disk 18, it will be remembered, extends through the perforation 17, it projecting through a central perforation 23 in the valve or disk 20'. The stem 19 above the valve 20' is provided with an annular shoulder 24, which fits against the valve 20' in proximity to the opening 23 thereof, so as to hold the valve against dislodgment. The disk 18 and ring 15 and connected parts constitute a cage, and they may be made from glass or any other suitable substances.

The bottle having been filled with liquid and parts thus far described having been inserted in the neck of said bottle, it will be apparent that by tilting the same the outflowing liquid by striking against the free portion of the valve 20' can lift such free portion away from its seat, so that the liquid can freely escape from the bottle, and as soon as



the bottle is put into its vertical position the valve by its own resiliency will assume its closed position. If an attempt be made to pour liquid into the bottle or to inject the same therein under pressure, the inflowing liquid by striking the upper surface of the valve 20' will force the same against its seat, so that it is not possible to fraudulently refill the bottle. It will be obvious that by providing a flexible disk valve of the kind set forth and holding the same centrally and leaving it free along its edge the contents of the bottle can be readily poured therefrom, no matter how the bottle may be tilted. The outgoing liquid after it passes the valve flows through the channels 13.

In pouring the liquid from the bottle in the manner described atmospheric air will enter the neck of the bottle and pass along the same into the channels 21 and from thence to the bore 20, said bore connecting with the interior of the bottle, as will hereinafter appear, the air thus flowing into the bottle filling the vacuum that is caused by the discharge of the liquid from said bottle, so as to provide for the free emptying of the latter.

I provide means, one suitable form of which will now be described, for preventing the introduction of liquid into the bottle through the stem 19. Fitted over the lower end of the stem 19 is a tubular coupling 25, of rubber or other suitable material, which is adapted to receive the short tube 26. The tube 26 at or near its lower end is adapted to snugly receive the tube 27, the bore of which is of course of less diameter than that of the external tube. The interior and very short tube 27 may be made of rubber or like material, and it constitutes a suitable seat for the valve 28, angular in cross-section and having a rounded lower end 28', the upper end of the valve having a transverse groove 29, said groove being formed in direction of the least diameter or width of the valve.

When the bottle is in an upright or vertical position, the valve 28 will be seated by gravity, its rounded lower end 28' closing the upper end of the short tube 27, so as to prevent the passage of liquid by the valve that may have been poured into the tube 26 from the neck of the bottle. When the bottle is tilted to pour off the liquid therefrom, the valve 28 of course falls away from its seat, so that the atmospheric air can pass between the valve and the inner surface of the tube 26, and hence through the other tube 27 to the inside of the bottle, so as to destroy the vacuum therein in the manner previously indicated.

The disk 18 supports upon its upper surface the cup-shaped or concaved part 29', the two parts being suitably secured together and said cup-shaped part constituting an effective guard to prevent the introduction of wire or like articles thereby and into contact with the valve 20'. The part 29' is inserted into the neck of the bottle in the manner described

in Letters Patent No. 698,330, granted to me April 22, 1902, and the shoulder 12' prevents the withdrawal of said part after it is in place.

The neck of the bottle may be furnished with a stopper or cork 30, as is usual.

The invention of course is not limited to the exact construction previously described, for many variations may be adopted within the scope of the accompanying claims.

The upper face of the disk 18 has a conical counterbore 35 situated just below the concaved guard and which is adapted to receive the correspondingly-shaped plug or check valve 36, the latter being adapted to fall by its weight against the upper end of the bore 20 when the bottle is upright, so as to prevent the passage of fluid downwardly thereby. When the bottle is tipped to secure the discharge of its contents, the conical plug or check valve 36 falls away from the upper end of the bore 20, so as to permit the entrance of atmospheric air through said bore. In some cases I may dispense with the valve 36 or the valve 28 and cooperating parts, or employ them both.

Having described the invention, what I claim is—

1. In a non-refillable bottle, a ring supported in the neck provided with a cross-piece having a perforation, a flexible disk constituting a valve and supported by said ring and having a perforation registering with the said other perforation, a second disk provided with a depending stem adapted to project through such perforation, and said disk having a channel on its upper face, and the stem having a bore in communication with said channel, a guard above said second disk, a valved tube connected with said depending stem and means bearing against the said disk valve centrally thereof to hold the same in place, the edge of said disk valve being free.

2. In a non-refillable bottle, a ring supported in the neck and provided with a cross-piece having a perforation, a flexible disk constituting a valve and supported by said ring, and having a perforation registering with said other perforation, a second disk provided with a depending stem adapted to project through said perforations and said second disk having a channel in its upper face, and a stem having a bore in communication with said channel, a shoulder on the stem bearing against said disk valve, a guard above said second disk, and a valved tube connected with said stem.

3. In a non-refillable bottle, a ring supported in the neck thereof and provided with a cross-piece having a perforation, a flexible disk constituting a valve and supported by said ring and having a perforation registering with said other perforation, a second disk provided with a depending stem adapted to project through said perforations, and said disk having a plurality of radial channels upon its upper face, and the stem having a



bore in communication with the said channels, a shoulder on the stem adapted to fit against said disk valve centrally thereof, and a valved tube connected with said stem.

5 4. In a non-refillable bottle, a ring supported in the neck of said bottle and provided with a cross-piece having a perforation, a flexible disk constituting a valve and supported by said ring and having a perforation  
10 registering with said other perforation, a second disk provided with a depending stem adapted to project through said perforations, and said second disk having a channel in its upper face and the stem having a bore in  
15 communication with said channel, a guard carried by said second disk, and a valved tube connected with said stem.

5. In a non-refillable bottle, the neck thereof having an annular horizontal groove and  
20 a series of vertical grooves intersecting said horizontal grooves, an annular shoulder in the neck below said vertical grooves, a ring supported by said shoulder and provided with a cross-piece having a perforation, a flexible  
25 disk constituting a valve and supported by said ring and having a perforation, a second disk provided with a depending stem adapted to project through said perforations, and said second disk having a channel on its up-  
30 per face, and the stem having a bore in communication with the said last-mentioned channel, a guard above said second disk, and a valved tube connected with said stem.

35 6. In a non-refillable bottle, the neck thereof having a horizontal annular groove and a series of vertical grooves intersecting said annular grooves and an annular shoulder below said vertical grooves, a ring supported by said annular shoulder, and provided with

a cross-piece having a perforation, a disk con- 40  
stituting a valve and supported by said ring, and having a perforation registering with said other perforation, a second disk provided with a depending stem adapted to project  
45 through said perforations, and said second disk having a channel in its upper face, and a stem having a bore in communication with the said channel, a guard carried by said second disk, a tubular coupling fitted to the lower  
50 end of said stem, and a valved tube connected with said tubular coupling.

7. In a non-refillable bottle, the neck thereof having a horizontal annular groove and a series of vertical grooves intersecting said  
55 annular grooves and an annular shoulder below said vertical grooves, a ring supported by said annular shoulder, and provided with a cross-piece having a perforation, a disk constituting a valve and supported by said ring,  
60 and having a perforation registering with said other perforation, a second disk provided with a depending stem adapted to project through said perforations, and said second disk having a channel in its upper face, and  
65 a stem having a bore in communication with said channel, a guard carried by said second disk, a tubular coupling fitted to the lower end of said stem, a valved tube connected with said tubular coupling, and a conical  
70 valve freely fitted in the correspondingly shaped bore in said second disk.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

EDWARD C. SHILLING.

Witnesses:

FRANK T. CLARKE,  
FRANK WILSON.