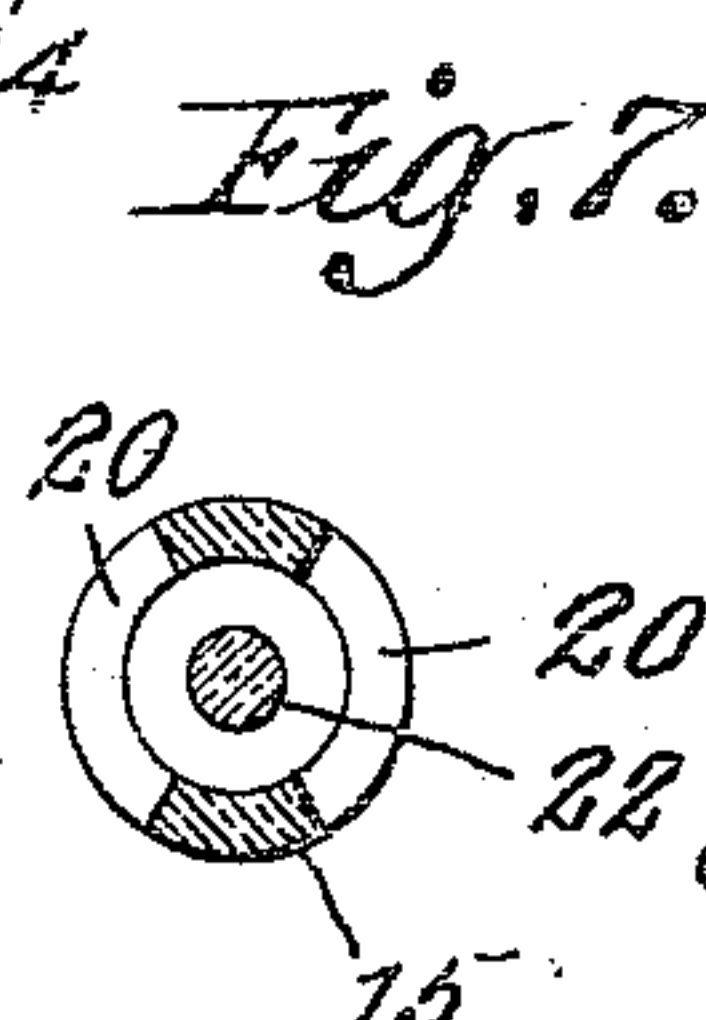
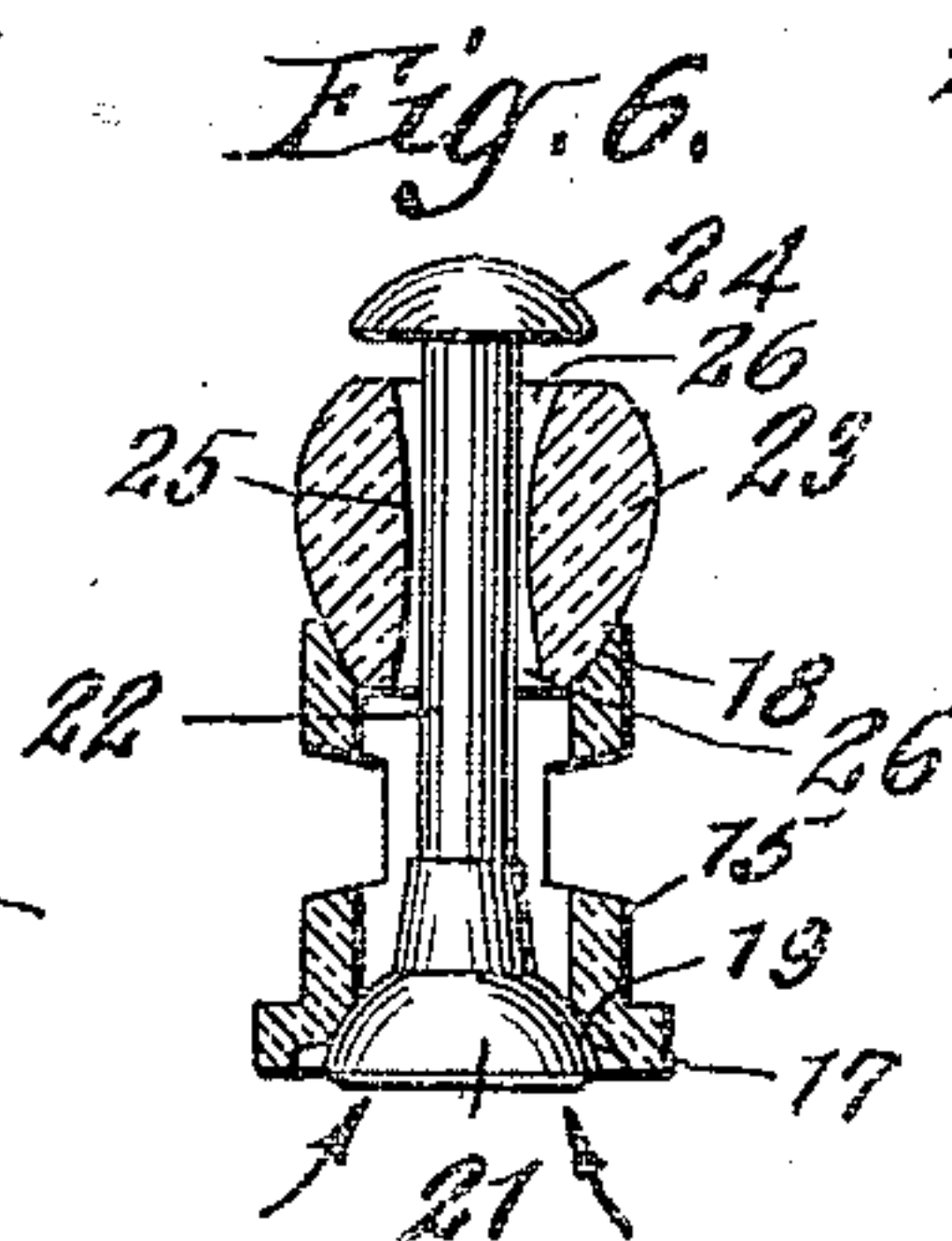
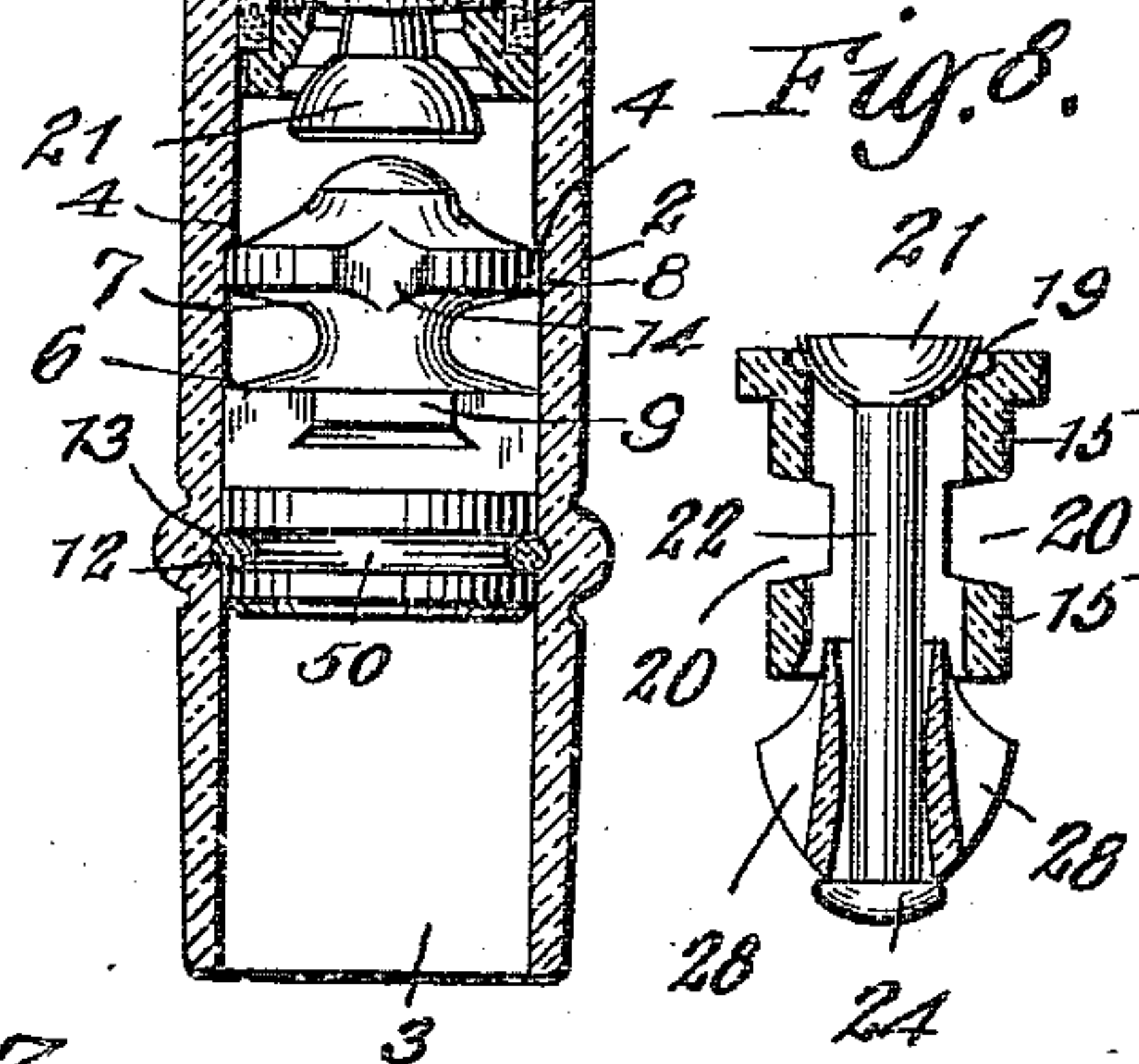
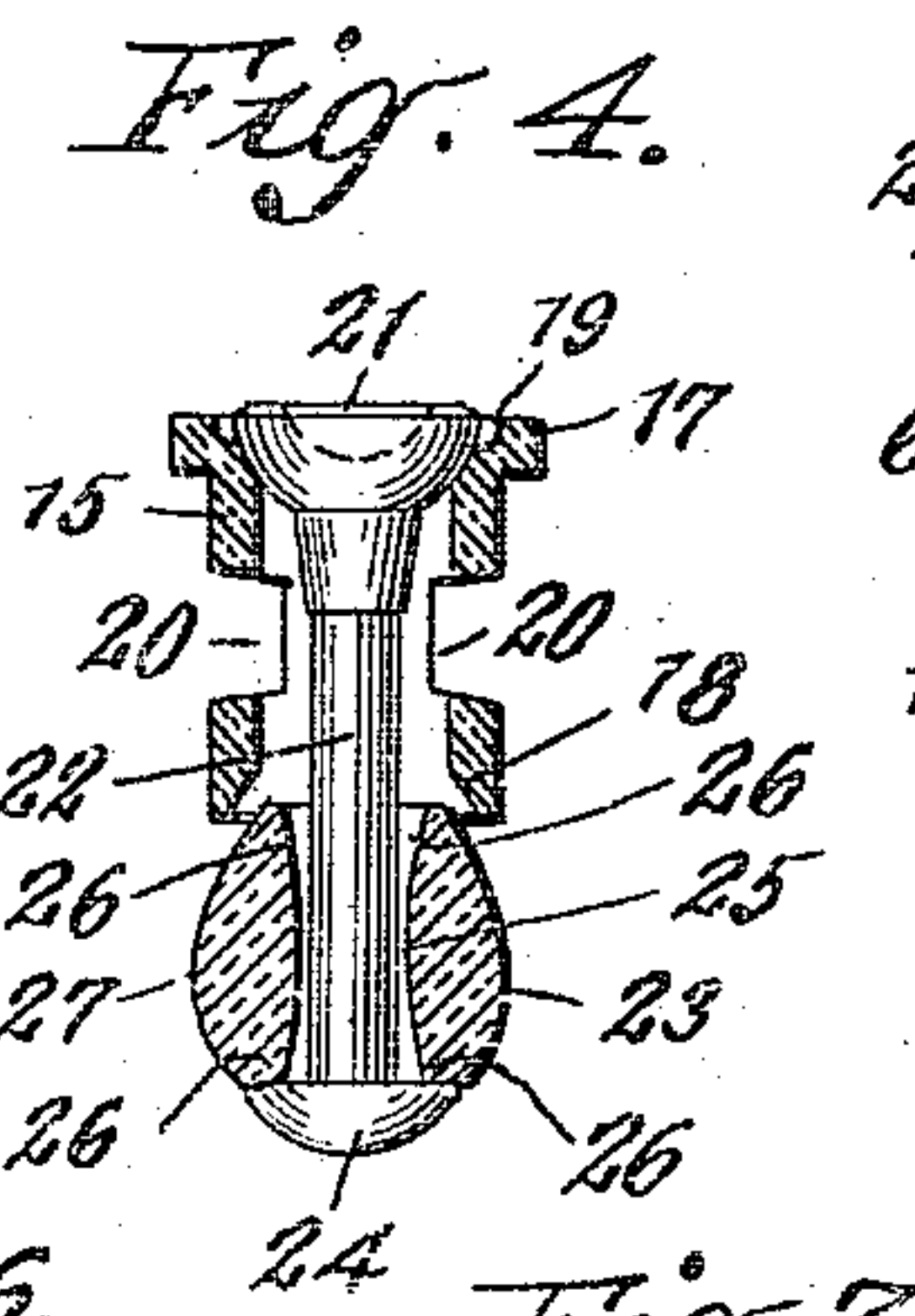
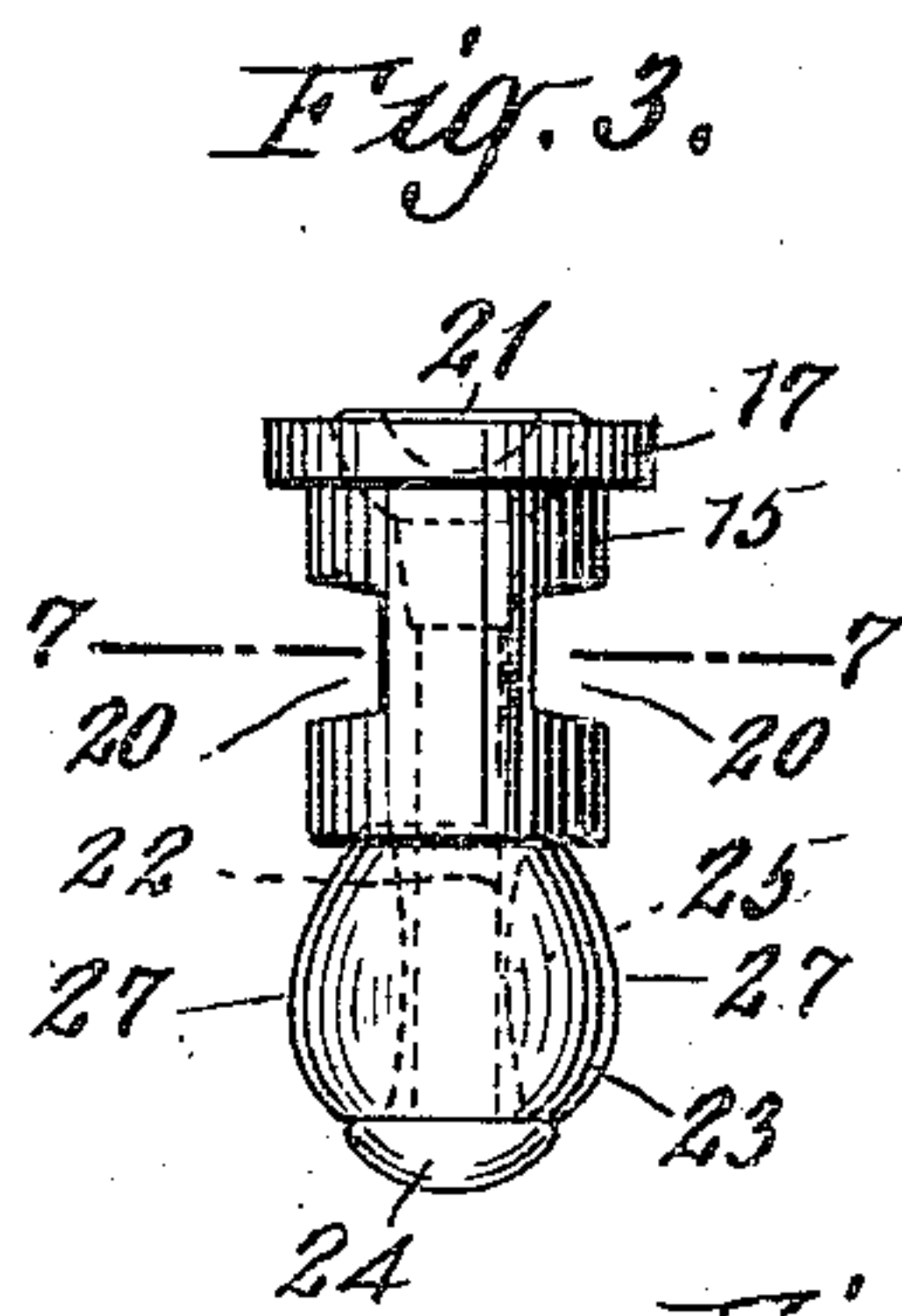
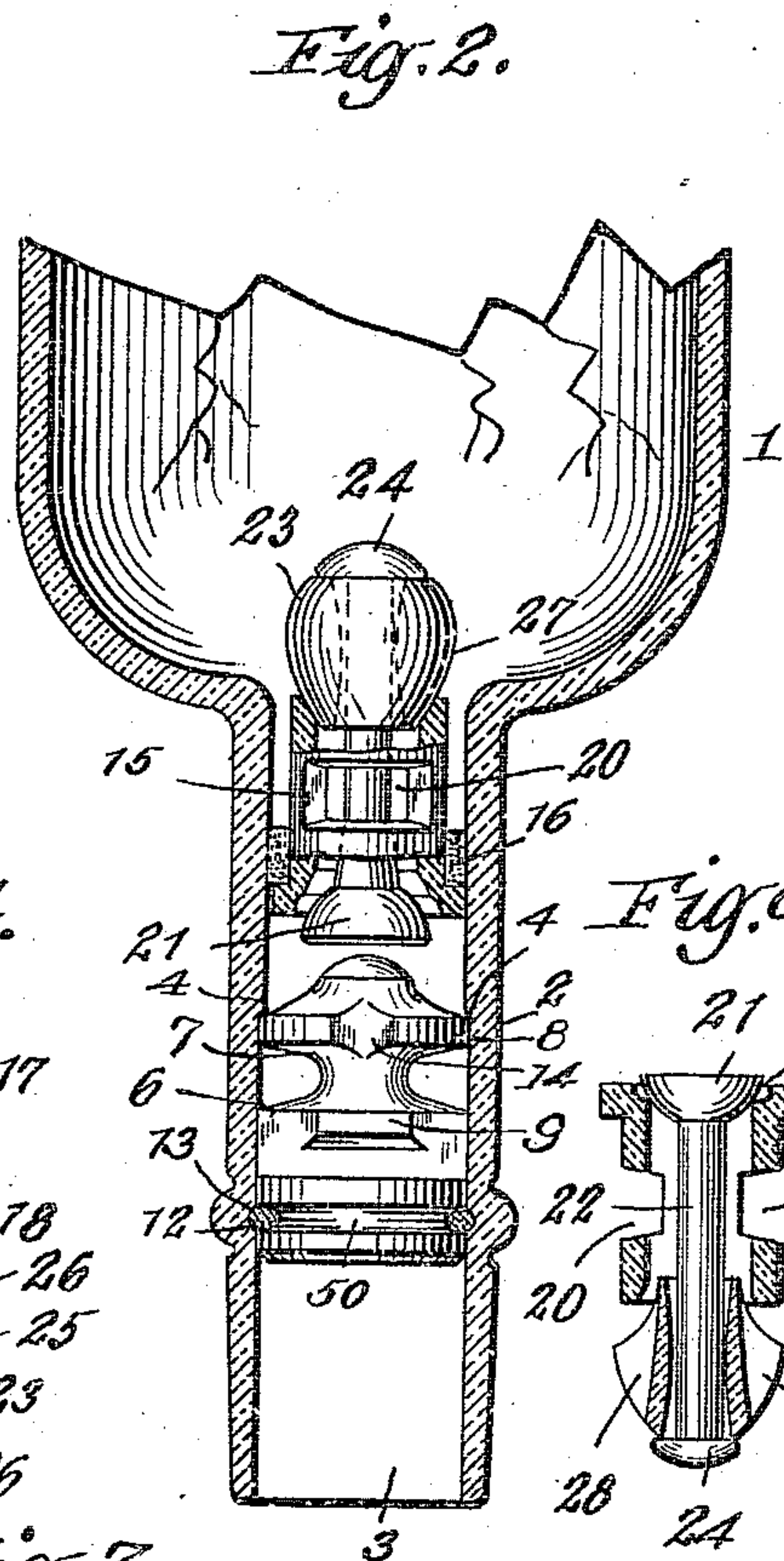
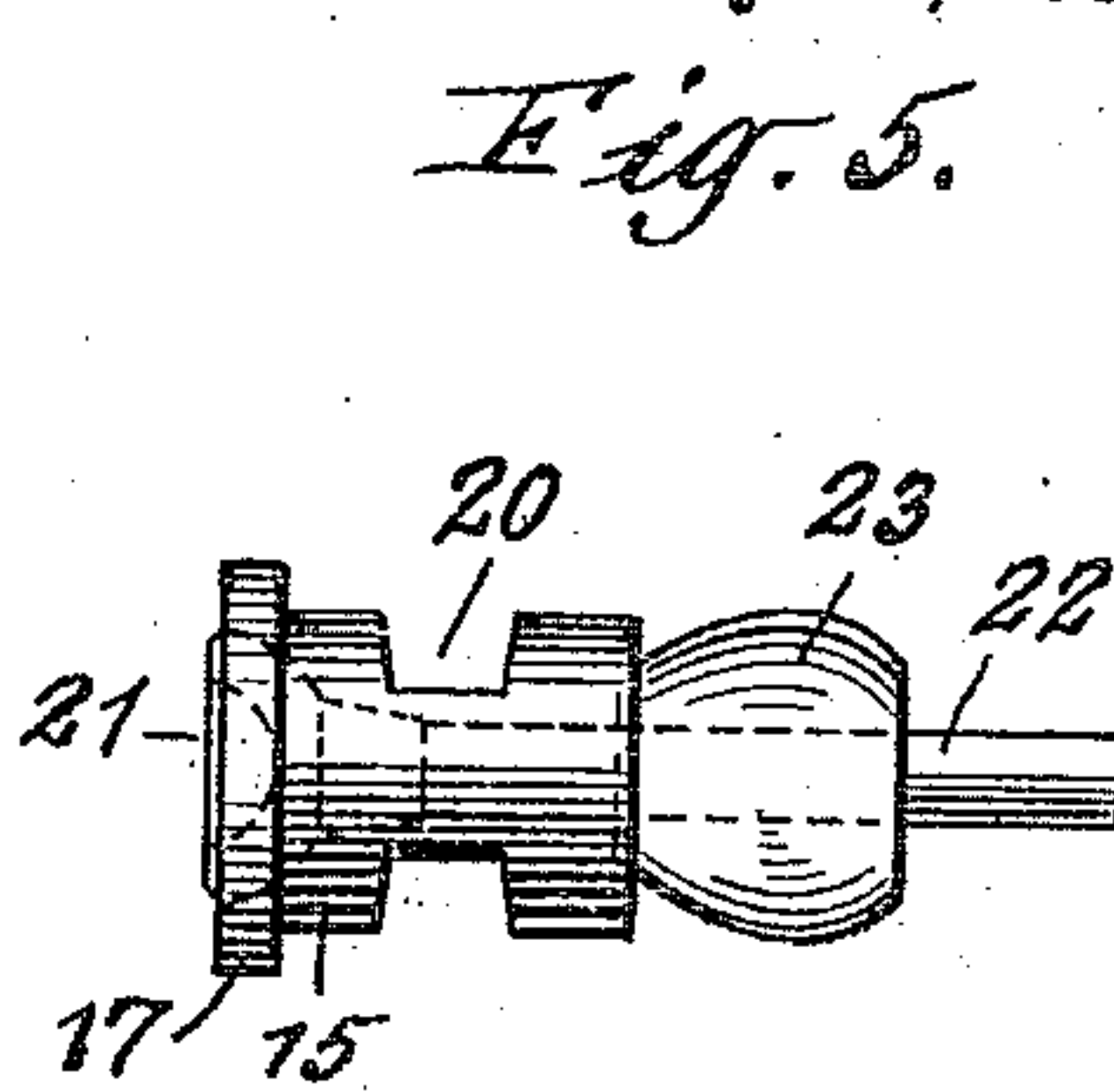
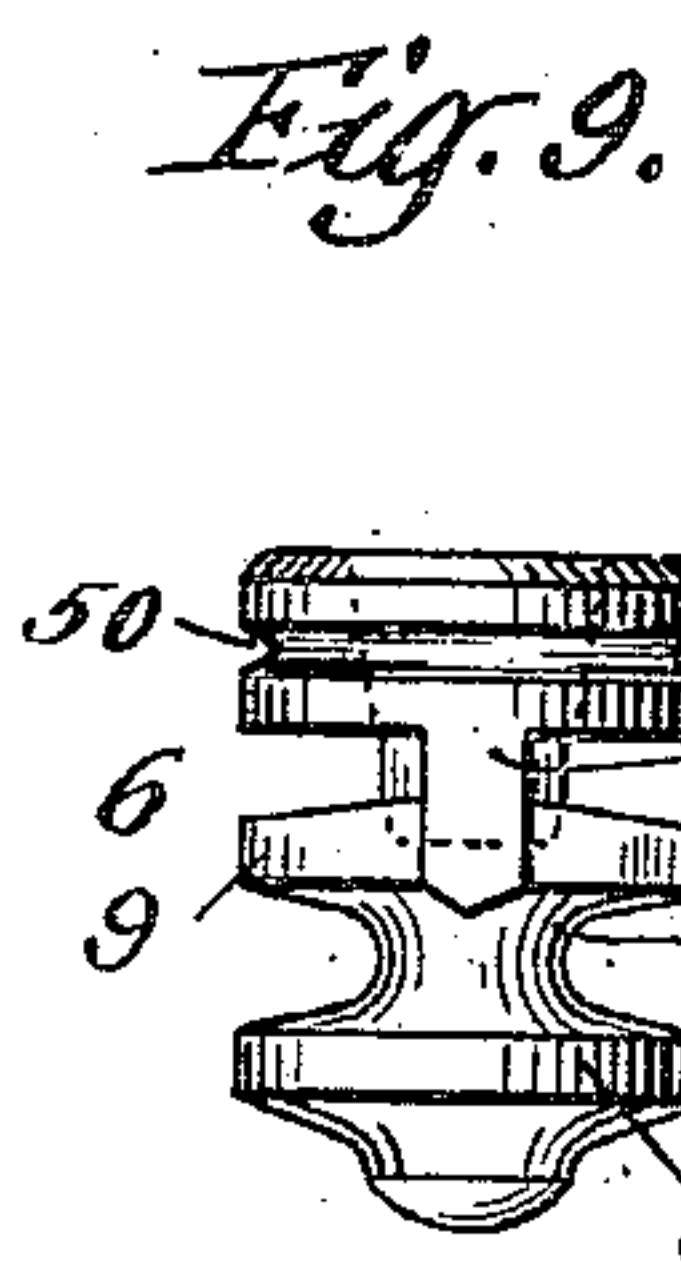
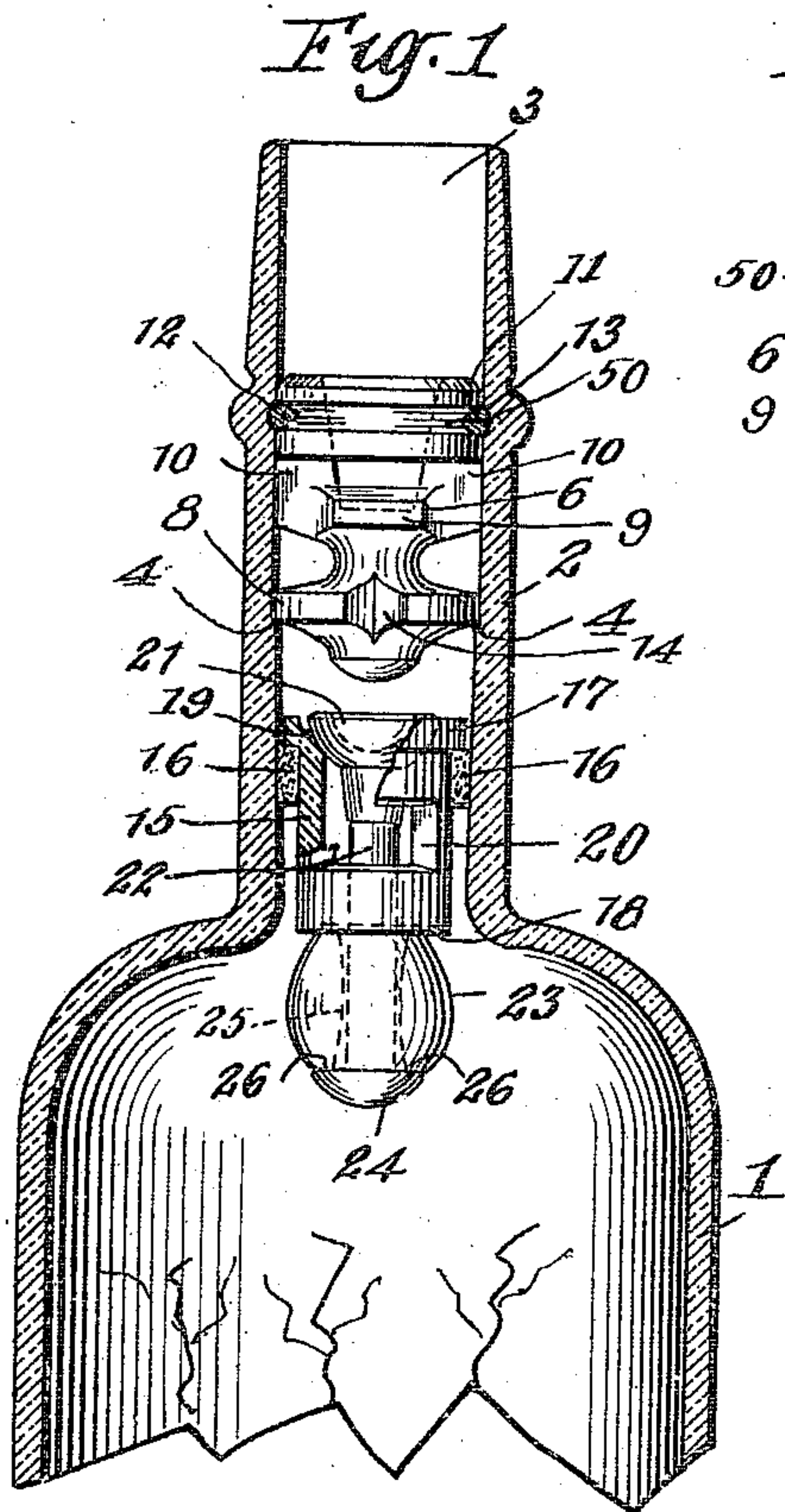


L. M. PACKARD.
NON-REFILLABLE BOTTLE.
APPLICATION FILED JULY 2, 1909.

959,792.

Patented May 31, 1910.



WITNESSES:
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LUCIUS MORTON PACKARD, OF BROCKTON, MASSACHUSETTS.

NON-REFILLABLE BOTTLE.

959,792.

Specification of Letters Patent.

Patented May 31, 1910.

Original application filed January 15, 1909, Serial No. 472,513. Divided and this application filed July 2, 1909. Serial No. 505,553.

To all whom it may concern:

Be it known that I, LUCIUS MORTON PACKARD, a citizen of the United States, and a resident of Brockton, in the county of Plymouth, in the State of Massachusetts, have invented certain new and useful Improvements in Non-Refillable Bottles, of which the following is a specification, taken in connection with the accompanying drawing, which forms a part of the same, this application being a division of my application, Serial No. 472,513, filed January 15, 1909.

This invention relates to non-refillable bottles in which a valve and guard coöperate to permit the original contents of the bottle to be dispensed, but which prevent the bottle, after the original contents are used, from being again filled with a substitute or spurious liquid.

This application relates more particularly to the valve and valve mechanism.

In the accompanying drawings showing one illustrative embodiment of this invention and in which the same reference numerals refer to similar parts in the several figures,—Figure 1 is a central longitudinal vertical section taken through a bottle equipped with my invention, some of the parts being shown in side elevation for purposes of better illustration. Fig. 2 is a similar vertical section to that shown in Fig. 1, the bottle being inverted and shown in its dispensing position. Fig. 3 is a detail side elevation of the valve mechanism removed from the bottle. Fig. 4 is a vertical section through the valve casing and weight, the other parts of the valve mechanism being shown in side elevation; Fig. 5 is a side elevation of the valve mechanism showing the manner of assembling the weight on the valve stem; Fig. 6 is a longitudinal vertical section of my valve mechanism inverted, and shown on a smaller scale; Fig. 7 is a transverse horizontal section on line 7—7 of Fig. 3; Fig. 8 is a longitudinal vertical section through a valve mechanism the weight being provided with scores or cuts; Fig. 9 is a side elevation of one form of guard which may be used with my valve mechanism.

In the illustrative embodiment of this invention shown in the drawing, 1 is a bottle provided with a neck 2, the interior of which I preferably make slightly tapering, permitting it to slightly flare outward to-

ward the mouth 3. At some point in the neck 2 and located a sufficient distance from the mouth 3, I preferably form a shoulder 4 against which the lower portion or petticoat 8 of any suitable form of guard 6 may be seated.

So far as this application is concerned, the form of the guard 6 is immaterial. Any form of guard which will prevent tampering with the valve can be used. Simply for purposes of illustration, I have shown a guard which in practice has proved perfectly satisfactory, and which is illustrated, described and claimed in my prior application Ser. No. 472,513. This guard is provided with a body portion 7, having at its lower end a petticoat 8. The upper part of the body portion is provided with laterally extending wings 9, 9, arranged substantially 90° from the upwardly extending arms 10, 10, connecting the body portion 7 with the hollow head 11 of the guard 6. In this head 11, I preferably, though not necessarily, form an annular groove 50 to connect with a packing 12, which in turn coöperates with an annular groove 13 in the neck of the bottle. In this form of guard the petticoat 8 is provided with one or more openings 14, 14, to permit the free passage of the liquid when the bottle is held in dispensing position as shown in Fig. 2.

By choking or tapering the interior surface of the neck 2 of the bottle, I permit the valve casing 15 with its packing ring 16 to find its own seat in the neck of the bottle which, of course, will be some suitable point below the guard 6. This valve casing 15 may be given any suitable configuration, but I preferably form it as a hollow cylinder having at its upper end a flange 17 to coöperate with the packing ring 16. On its lower end a tapering seat 18 is located, while the upper end of the valve casing 15 is provided with a valve seat 19; between the two ends of the casing are provided openings or passages 20, two such passages being shown in the figures of the drawing. To coöperate with this valve seat 19, I provide a valve 21, having an elongated stem 22 of sufficient length to pass through the casing to receive at its lower end a weight 23. This weight is preferably formed hollow, the upper end being a frustum of a cone and adapted to coöperate with the seat 18 in the lower surface of the casing 15 and the

weight is held to the valve stem 22 in any suitable manner such, as by forming a stop or button 24 on the end of the stem.

The valve stem and the weight are so arranged that there is a relative and independent movement between them. The interior of the weight 23 may be formed of one diameter throughout to permit the free passage of the valve stem 22, but preferably at some intermediate point I make the opening of minimum diameter and from that point to either end increase the diameter of the opening. For instance I make the passage of minimum diameter at 25 and form the ends 26, 26 of the passage of gradually increasing diameter from that point. By this arrangement I obtain a peculiar teetering movement of the weight 23 upon the valve stem 22, which adds to its sensitiveness without interfering with the free relative movement of the weight on the valve stem. The friction of the weight 23 upon the stem is also reduced to a minimum as the normal point of engagement between these members is only where the surface 25 contacts with the stem 22. This relative movement between the valve stem and the weight is particularly advantageous if it is attempted to force spurious liquids into the bottle. In such attempts it is usual to first invert the bottle bringing the valve and weight into the position shown for instance in Figs. 2 and 6 of the drawing. It will be readily seen from an inspection of Fig. 6 that if liquids are attempted to be forced into the bottle in the direction of the arrow, the valve 21 immediately tends to seat itself upon the valve seat 19 free of the weight 23, the valve stem 22 merely passing through the weight 23 without lifting it. In practice this is very important for if the valve can operate independently of the weight, in this position of the parts, it is much more sensitive and will instantly close if any liquid is attempted to be forced back into the bottle.

While the weight may have various shapes or contours I preferably form it so that its exterior surface assumes the shape of two integral abutted conical frustums, their bases being brought together to form the largest diameter 27 of the weight which tapers preferably, though not necessarily, unequally from this point to either end.

In some instances, though not necessarily, I may score or cut the exterior surface of the weight forming passages 28, 28, Fig. 8. These passages form additional outlets from the bottle to the interior of the valve casing 15 which permit the liquid in the bottle to more readily unseat the valve 21 when the contents are to be dispensed. In addition to this function these scores or cuts in the weight, if used, serve to proportionally lighten the upper cone to a greater extent than the lower one, (it being considered that

the weight is made of two conical frustums) which is taken advantage of in the rocking or teetering motion of the weight on the stem 22. In other words these cuts lighten the upper part of the weight proportionally more than they do its lower part which tends to make the rocking movement of the weight on the stem even more sensitive, though it is to be understood that the peculiar shape of the passage through the weight 23 makes the rocking or teetering of the weight on the stem 22 very sensitive, even though the scores or cuts 28 are omitted.

In the use of my invention the bottle 1 is filled with any liquid desired when the valve, valve casing and weight are dropped into the tapered or choked neck of the bottle, the valve casing being subjected to sufficient pressure to cause the packing 16, of any suitable description, to securely hold the valve mechanism in the neck. The guard 6 is then dropped into the neck of the bottle until the petticoat 8 contacts with the stops or shoulders 4, which will bring the groove 50 in the head 11, together with the packing 12, of any suitable description, opposite the groove 13 in the neck, permitting the packing to expand and lock the guard securely in the neck. If the bottle is to be shipped, any suitable cork (not shown) is inserted in the mouth 3. To dispense the liquid the bottle is inverted in the position shown in Fig. 2, when the liquid is caused to flow around the valve casing 15, through the openings 20, 20 and also through the passages 28 in the weight, if they are used, into the hollow valve casing, thence beneath the valve 21 and out through the guard which may be, as noted, of any suitable construction. If, however, the flow of the liquid is reversed, as by attempting to refill the bottle with another liquid, the parts will operate in the manner previously described to prevent such action.

The guard as well as the valve mechanism will preferably be formed of glass or some other non-corrosive substance, and the former be made in one integral piece, but it is to be understood that my invention is not limited to this feature, nor is it to be limited to the peculiar and effective method of connecting the weight to the valve stem, as the valve will work efficiently if the bore in the weight is of uniform diameter, nor is my invention to be limited to the weight having the passages 28, nor is it to be limited to any particular form of guard. The weight 23 may be attached to the stem 22 in any suitable manner. When the parts are made of glass, which is the preferred material, the stem 22 is slipped through the weight, Fig. 5, the end of this stem 22 being then suitably heated and when in a viscous state the end of the stem is upset in any suitable manner to form the button or stop 24.

Having thus described this invention in connection with an illustrative embodiment thereof to the details of which I do not desire to be limited, what is claimed as new and what it is desired to secure by Letters Patent is set forth in the appended claims:

1. A valve mechanism comprising a valve casing, a valve, a valve stem, a weight loosely mounted upon the valve stem and adapted to have a free longitudinal movement on the same, and means for permitting the weight to have a teetering movement on the valve stem, said weight cooperating with the valve casing.

2. A valve mechanism comprising a valve casing, a valve, a valve stem, a weight loosely mounted upon the valve stem and adapted to have relative longitudinal movement with relation to it, the weight being provided with a central bore flared substantially the same at both ends, and adapted to cooperate with the valve casing.

3. A valve mechanism comprising a substantially cylindrical valve casing provided with lateral openings, a flange on the valve casing, a valve, a valve stem, a weight provided with a passage for the valve stem said passage having a substantially uniform flare at either end and said weight being

adapted to have longitudinal movement on the valve stem, and a button or stop on the end of the valve stem, the weight being adapted to cooperate with the valve casing.

4. A valve mechanism comprising a substantially cylindrical glass valve casing provided with lateral openings, an integral flange on the valve casing, a glass valve, a glass valve stem integral with the valve, a glass weight provided with a passage for the valve stem said passage having a substantially uniform taper to either end, said weight adapted to have free longitudinal movement on the same, and an integral glass button or stop on the end of the valve stem.

5. In a valve mechanism comprising a valve casing provided with openings, a valve, a rigid valve stem connected to the valve having its lower end provided with a stop to engage with the bottom of the weight, a weight loosely mounted on the valve stem and provided with an opening flared at both ends, the bottom of the weight cooperating with the stop carried by the valve stem.

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Witnesses:

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