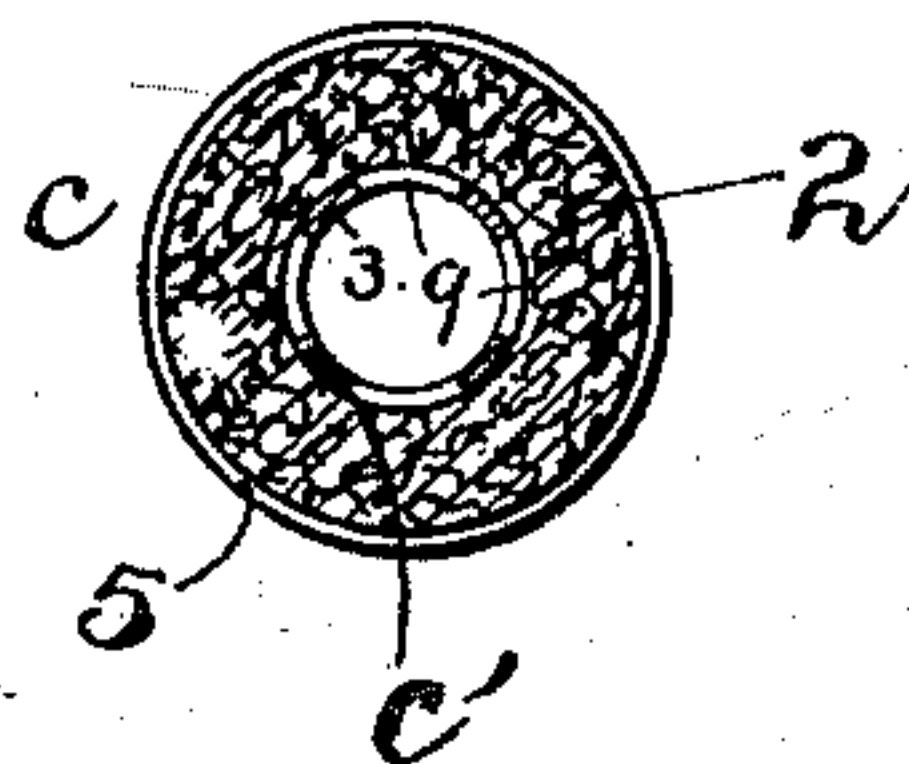
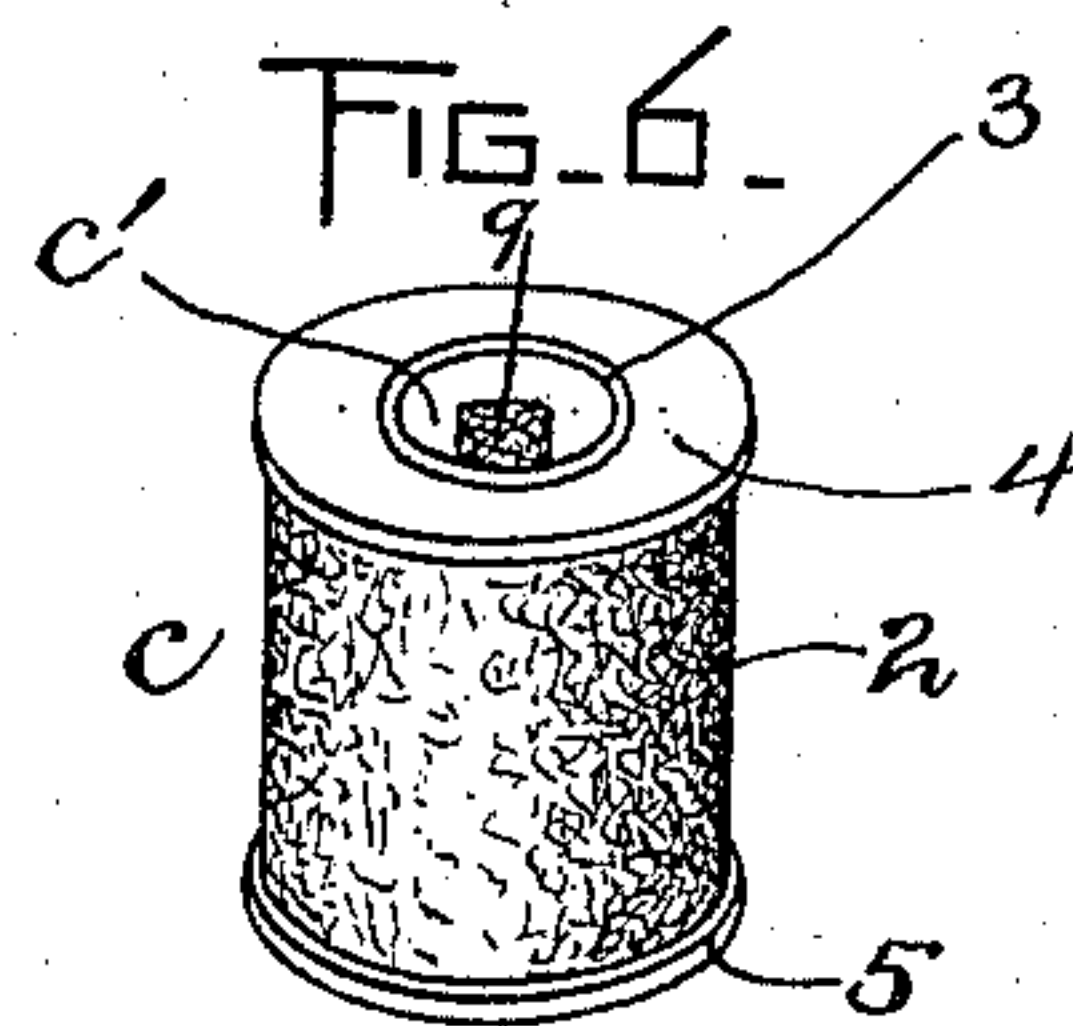
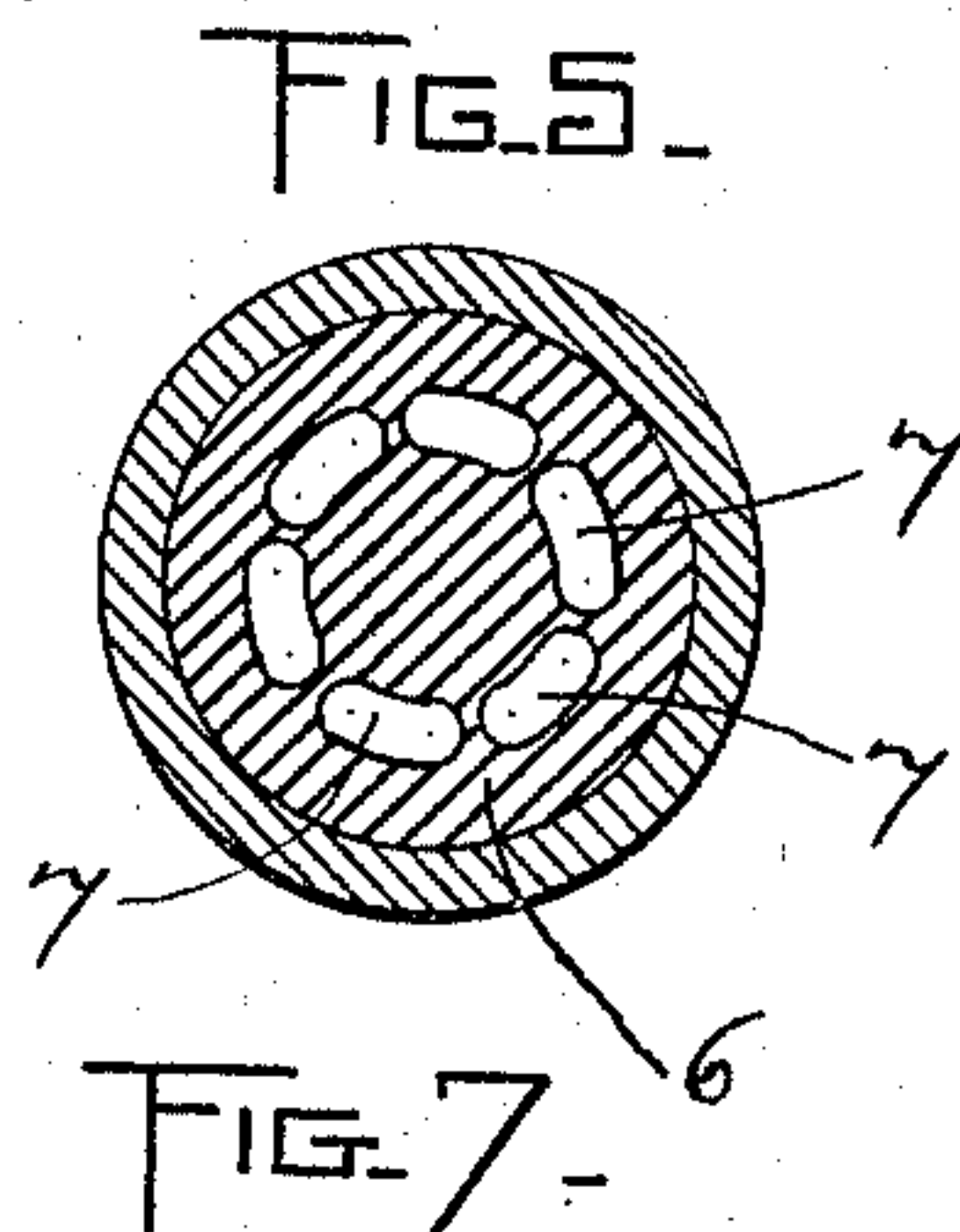
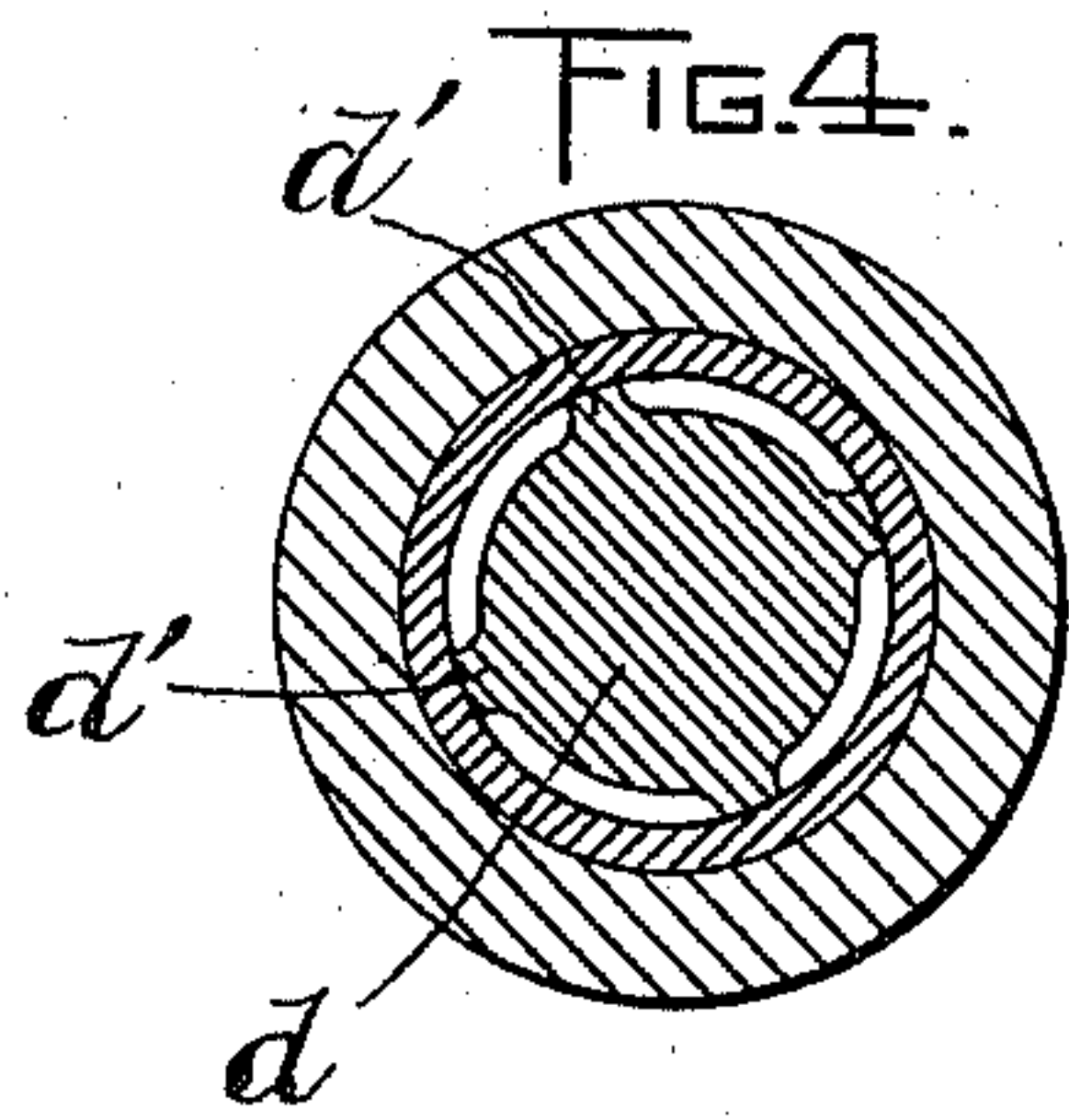
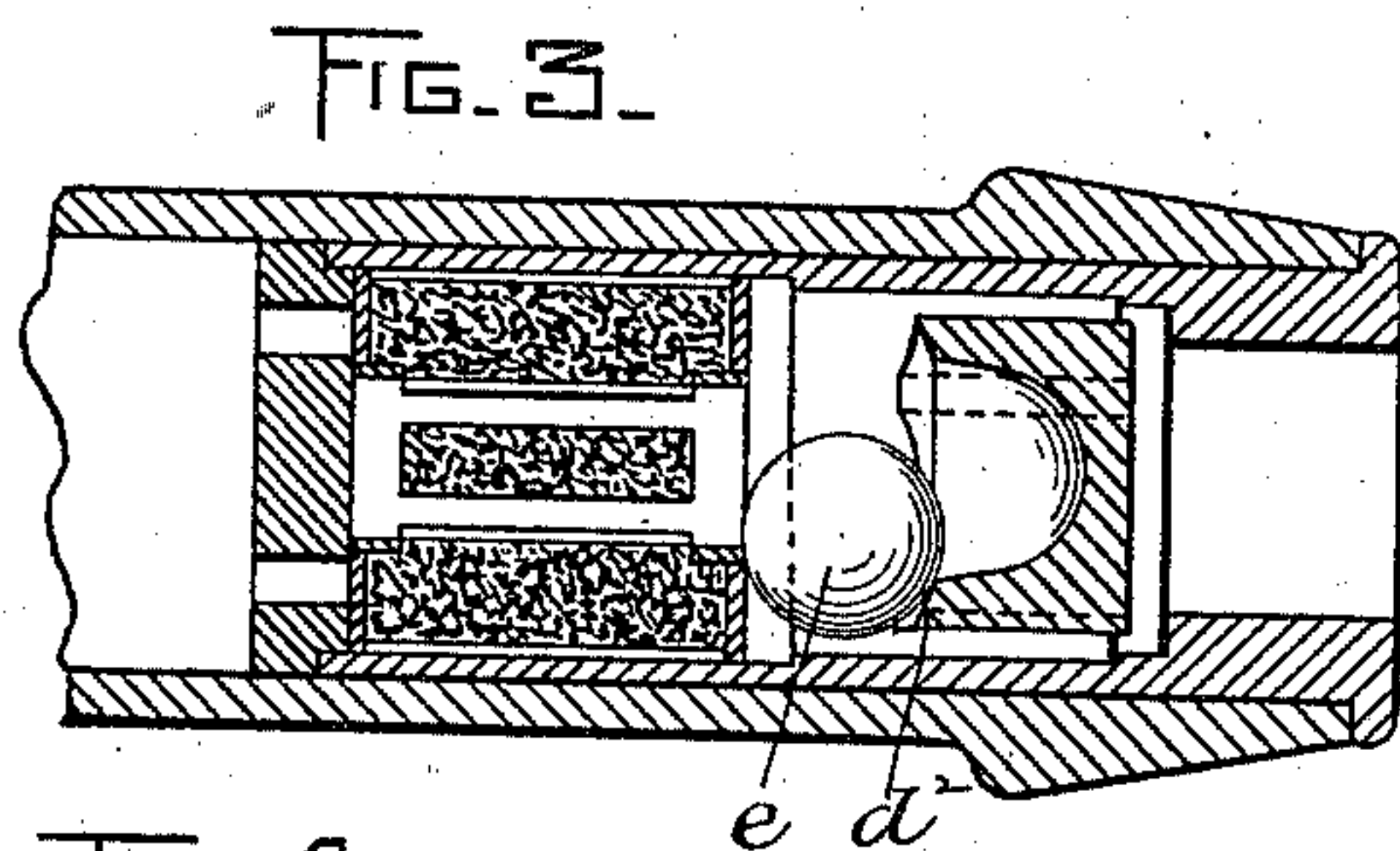
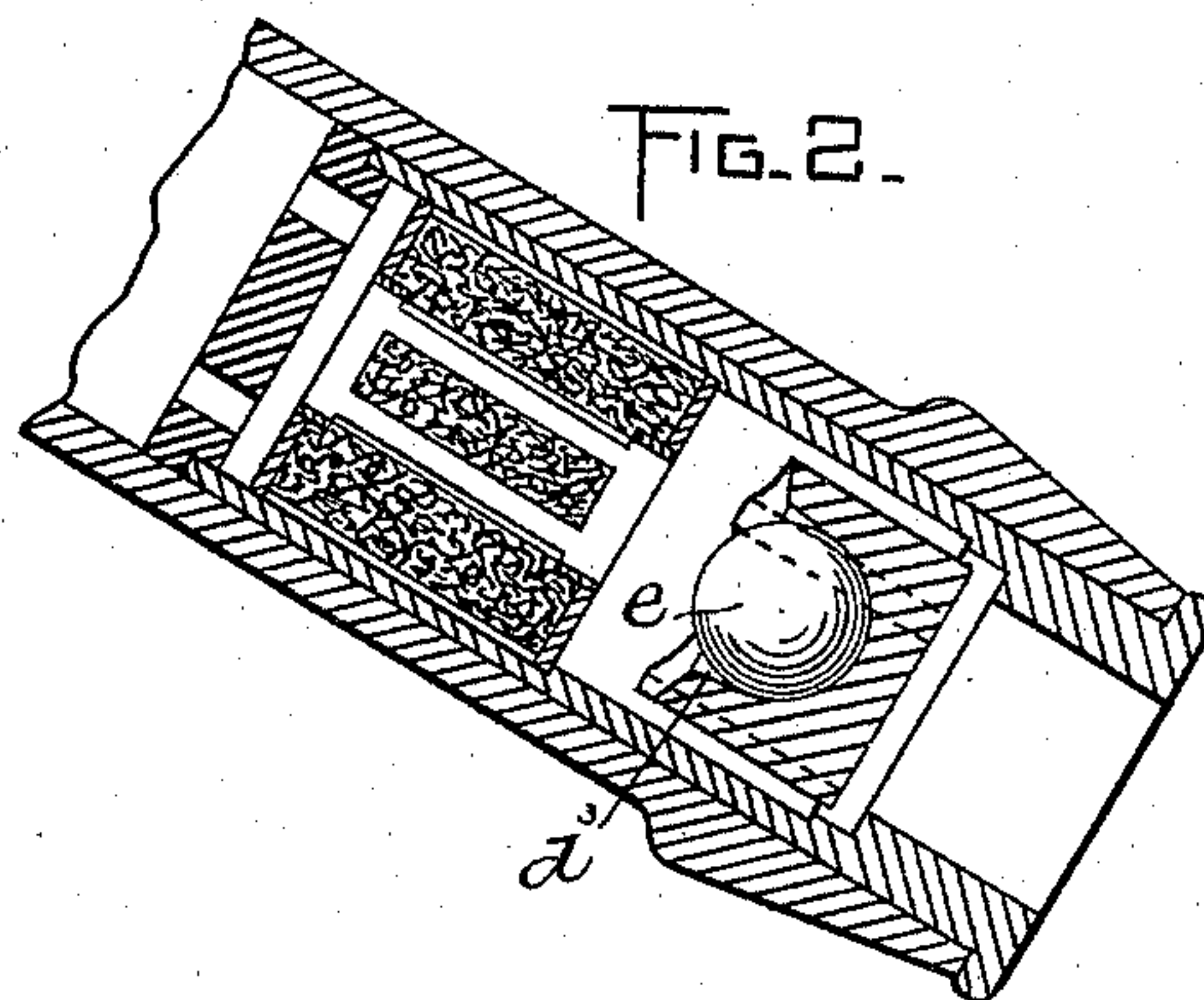
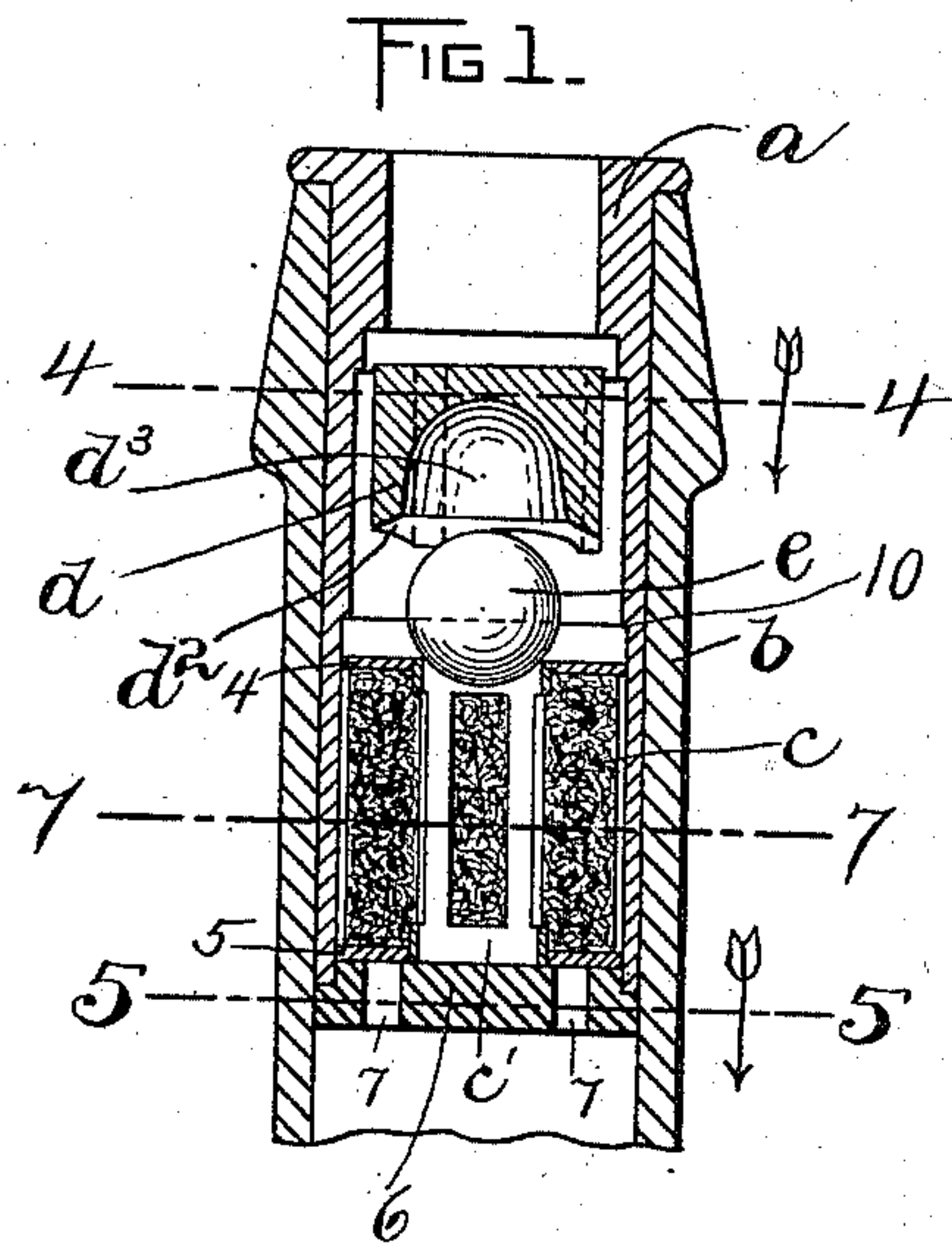


(No Model.)

T. F. LANGLEY.
BOTTLE STOPPER.

No. 578,996.

Patented Mar. 16, 1897.



WITNESSES:

A. D. Harrison.

A. D. Adams.

INVENTOR:

J. F. Langley

by Knight, Brown & Lundy
attys.

UNITED STATES PATENT OFFICE.

THOMAS F. LANGLEY, OF HAVERHILL, MASSACHUSETTS, ASSIGNOR OF TWO-THIRDS TO DANIEL G. DUNBAR AND ED. M. PUTNAM, OF SAME PLACE.

BOTTLE-STOPPER.

SPECIFICATION forming part of Letters Patent No. 578,996, dated March 16, 1897.

Application filed February 24, 1896. Serial No. 580,313. (No model.)

To all whom it may concern:

Be it known that I, THOMAS F. LANGLEY, of Haverhill, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Bottle-Stoppers, of which the following is a specification.

This invention relates to appliances for preventing the refilling of bottles; and it has for its object to provide a simple and efficient device adapted to prevent all attempts to force liquid into the bottle either by immersing it and holding it horizontally while liquid is being forced into the neck or otherwise.

The invention consists in the improved antirefilling device which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a sectional view of my improved antirefilling device applied to the neck of a bottle, the latter being in an upright position. Fig. 2 represents a similar view showing the neck of the bottle in position for discharging the contents of the bottle. Fig. 3 represents a similar view showing the neck in a horizontal position. Fig. 4 represents a section on line 4 4 of Fig. 1. Fig. 5 represents a section on line 5 5 of Fig. 1. Fig. 6 represents a perspective view of the valve. Fig. 7 represents a section on line 7 7 of Fig. 1.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents a tubular casing formed to be inserted in the neck *b* of a bottle and adapted to serve as a conduit for liquid from the interior of the bottle when the latter is in position for discharging its contents. The casing is provided at its inner end with a valve-seat 6, formed to permit the passage of liquid through it, preferably by means of a concentric series of orifices 7.

c represents a valve which is formed to have a piston-like or sliding fit in the interior of the casing *b* and is movable between the seat 6 and an inwardly-projecting stop or check 10 on the interior of the casing, said seat and stop permitting the valve to have a limited movement in the direction of the length of the casing. The valve is provided with means, preferably a central passage or

conduit *c'*, for the flow of liquid through its body, so that liquid in escaping from the bottle passes through the valve. The valve is of buoyant construction, so that it will float in ordinary liquids, this result being secured in the present instance by providing the valve with an annular body portion or extension 2, of cork, attached to a cap 5, of glass or some non-corrosive material, constituting the valve proper, the buoyant extension being secured to the cap 5 in the present case by a tube 3, attached at its inner end to the cap 5 and at its outer end to a cap or flange 4, bearing on the outer end of the extension. For the sake of lightness I provide the tube 3 with longitudinal slots 9, whereby a considerable part of the material of said tube is removed.

The cap 5 has a flat under surface, which is formed to rest upon the valve-seat 6. The opening or passage through the valve is arranged out of line with the passages through the valve-seat, so that the combined conduit formed by the said passages is closed when the valve is seated and opened when the valve is displaced. It will be seen that by thus making provision for the flow of liquid through the body of the valve I am enabled to make the valve of large area, so that it fits the interior of the casing after the manner of a piston, and is therefore adapted to be moved toward its seat by pressure of liquid against it in case an attempt is made to fill the bottle by forcing liquid into the casing under pressure. The buoyancy of the valve is such that it will be floated by any liquid in which it is immersed. Hence the buoyant extension facilitates the closing of the valve by liquid forced into the casing in case the bottle is held in a vertical or in an inclined position with the mouth down.

d represents a guard which is placed in the casing between the mouth of the latter and the valve, said guard being formed to permit the outward passage of liquid through the casing and to prevent the insertion of a flexible rod or wire for the purpose of holding the valve open. The guard, as here shown, is a circular piece of any suitable material, having ribs *d'* *d'*, Fig. 4, upon its surface, which bear against the interior of the casing, the spaces

between said ribs forming passages through which liquid can flow from the interior of the casing outwardly through the mouth thereof. The inner end of the guard d has a beveled face d^2 surrounding a recess or cavity d^3 in said guard. Said recess is formed to receive a loose ball e , which is interposed between the guard and the valve and is formed to rest on the upper end of the extension c' of the valve when the bottle is upright, as shown in Fig. 1, thus acting as a weight to hold the valve seated.

When the bottle is in position to discharge its contents, as shown in Fig. 2, the ball e enters the recess d^3 by gravitation and permits the separation of the valve from its seat as far as the stop 10 will permit, so that an opening for the egress of liquid is formed through the seat and the valve, the liquid passing around the guard and out at the mouth of the casing. The beveled face d^2 on the guard surrounds the recess d^3 , and is arranged to hold the ball against the valve when the neck of the bottle is held horizontally, as shown in Fig. 3, thus causing the ball to hold the valve against its seat and preventing liquid from being forced into the bottle under pressure when the bottle is held horizontally.

The recess d^3 has inclined sides, and is of such depth that when the ball is rolled out of the recess it will acquire sufficient momentum to insure the seating of the valve, the inclined sides of the recess causing the ball to roll freely out of the recess when the bottle-neck approaches a horizontal position. The stop 10, by limiting the outward movement of the valve, insures a sufficient distance between the bottom of the recess and the outer end of

the valve to enable the ball to acquire its valve-closing momentum.

It will be seen that my improvement, although of very simple construction, constitutes an effective safeguard against all attempts to introduce liquid into a bottle which is equipped with said improvement.

I claim—

An antirefilling device, comprising a casing adapted for insertion in a bottle-neck and provided with a valve-seat at its inner end, a check or stop between the valve-seat and the outer end or mouth of the casing, a valve movable in the casing between the seat and stop, its outer end being formed to abut against the stop, a guard secured in the casing between the stop and the mouth of the casing and provided in its under side with a recess having inclined sides, and a loose spherical weight interposed between the valve and guard and formed to enter the recess therein, said recess being of sufficient depth to give the weight a valve-closing movement, while the stop is arranged to hold the outer end of the valve at a distance from the guard when the valve is opened, whereby the ball in rolling from the recess is caused to close the valve and then lock it by entering the space between the guard and valve.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 8th day of February, A. D. 1896.

THOMAS F. LANGLEY.

Witnesses:

HARRY J. COLE,
JASPER WORCESTER.