(No Model.)

J. A. MILLER.

BOTTLE STOPPER.

No. 549,678. Patented Nov. 12, 1895.

Fig. 1.

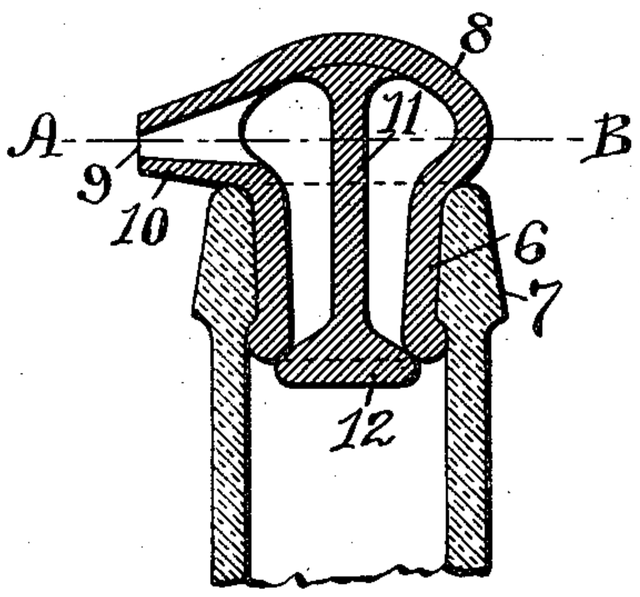


Fig. 2.

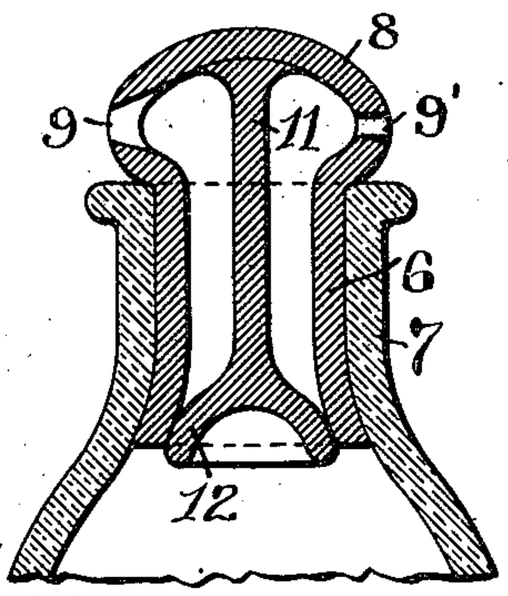


Fig. 3.

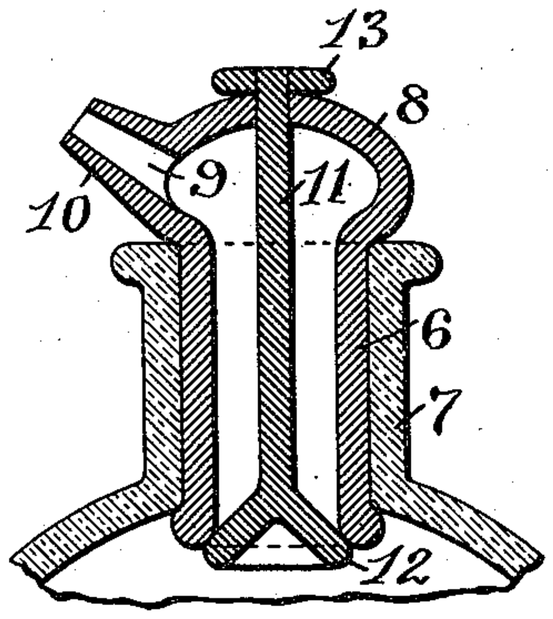
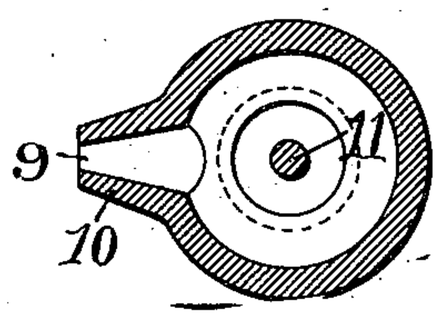


Fig. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOSEPH A. MILLER, OF PROVIDENCE, RHODE ISLAND.

BOTTLE-STOPPER.

SPECIFICATION forming part of Letters Patent No. 549,678, dated November 12, 1895.

Application filed November 14, 1893. Serial No. 490,935. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH A. MILLER, of the city of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Bottle-Stoppers; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to an improvement in stoppers adapted to close the opening in bottles and other vessels.

The object of the invention is to provide a stopper for a bottle or other vessel that will be cheap and simple in construction and by which the contents of a bottle or vessel or any desired portion of the contents may be readily drawn off.

Another object of the invention is to produce a stopper for bottles of india-rubber or similar material and without the use of any metal that, while it can be readily entered into the neck of a bottle, will be held and retained in the same against internal pressure without the use of any fastening device other than the parts forming the stopper.

The invention consists in the peculiar and novel construction of the stopper, as will be more fully set forth hereinafter.

Figure 1 is a vertical section of a bottle provided with a stopper adapted to automatically close the outlet and permit of the withdrawing of a portion of the liquid. Fig. 2 is vertical section of a bottle provided with a stopper adapted to permit the discharge of a portion or the whole of the liquid contents of the bottle. Fig. 3 is a vertical section of a bottle and a stopper adapted to discharge aerated liquid under pressure. Fig. 4 is a horizontal cross-section of the stopper on the line A B shown in Fig. 1.

The stopper consists in the tubular neck 6, which is made to fit the outlet-opening of the bottle 7 or other vessel to which the stopper is applied. The tubular neck may be provided with projections or enlargements fitting the interior of the outlet of the bottle or vessel, such as are shown at the lower end of the neck in the drawings, to secure the stopper, but will be firmly held in the bottle-neck without such projections. The outer end of the tubular neck 6 is closed by the arch 8, which forms, by the curved connection with the neck 6, an elastic bulb, an outlet 9 being made at one side for the discharge of the liquid. This outlet may be made in the wall of the stopper, as is shown in Fig. 2, or it may be extended and form the tube 10. Another opening 9′ may be made opposite the opening 9, as is indicated in Fig. 2, to permit the air to enter the bottle or vessel at this hole while the liquid is discharged from the opening 9. The valve-stem 11 is secured to the arch 8 and has at its lower end the valve 12. The valve-stem may be secured to the arch by cementation, as is shown in Figs. 1 and 2. It may be extended through the arch and provided with the button or secured in any other manner.

The stopper may be made of any suitable elastic material; but I prefer to make the whole of rubber or some similar elastic compound. In practice I make the tubular neck 6 and arch 8 of rubber sufficiently vulcanized to secure the desired resiliency in the arch 8 to hold the valve 12 firmly against its seat. The valve-stem 11 and valve 12 I usually make of hard rubber. The stopper may be made without the openings 9 9′ or tube 10 and used as an ordinary stopper.

The operation of the stopper is as follows: The stopper shown in Fig. 1, if used for aerated liquids under pressure, will discharge the liquid when the arch 8 is pressed down to move the valve 12 off from its seat and the bottle is tilted, so that the gas-pressure will act on the liquid. If used for still liquids, the air-hole 9′ facilitates the flow of the liquid. In all the forms shown pressure exerted on the arch 8 opens the valve 12. On the release of the pressure the valve closes.

When bottles provided with these stoppers are to be filled with liquids under pressure, the valve may be held in the open position by a suitable device and the liquid forced into the bottle through the opening 9.

The stopper being made entirely of india-rubber or similar elastic material is not affected by the acidity of the liquids usually contained in bottles; neither is the liquid as injuriously affected by contact with the rubber as it is when metals are used in the construction of parts of the stopper. In insert-

ing the tubular neck into the bottle the arch 8 is compressed to bring the valve 12 below the open end of the neck, which can now be crimped, so that it will readily enter the bottle, and when inserted the elasticity of the neck 6 expands it and the elasticity of the arch 8 draws the valve 12 into and against the open end of the neck. Internal pressure forces the valve 12 against the open end and sides of the neck and increases the adhesion of the neck of the stopper on the bottle and no auxiliary fastening is required.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A bottle-stopper consisting of a tubular neck provided at one end with an elastic bulb having a lateral outlet, and a valve, the stem of which is secured to the elastic bulb, constructed to close the open end of the tubular neck, as described.

2. A bottle-stopper made of elastic material consisting of a tubular neck open at one end and closed at the other end by an arched disk, and a conical valve, the stem of which is connected with the closed arched end of the tube, constructed to close the open end of the tubular neck and force the same against the neck of the bottle by the inherent resiliency of the closed arched end, as described.

3. In a bottle-stopper formed of elastic material the combination with the flexible tubular-neck 6, the arched bulbous end 8, and the discharge-tube 10, of the valve 12 and the valve-stem 11 connected with the end 8, constructed to close the passage through the stopper and expand the neck to secure and hold the stopper against the pressure in the bottle, as described.

In witness whereof I have hereunto set my hand.

JOSEPH A. MILLER.

Witnesses:
J. A. MILLER, Jr.,
M. F. BLIGH.