

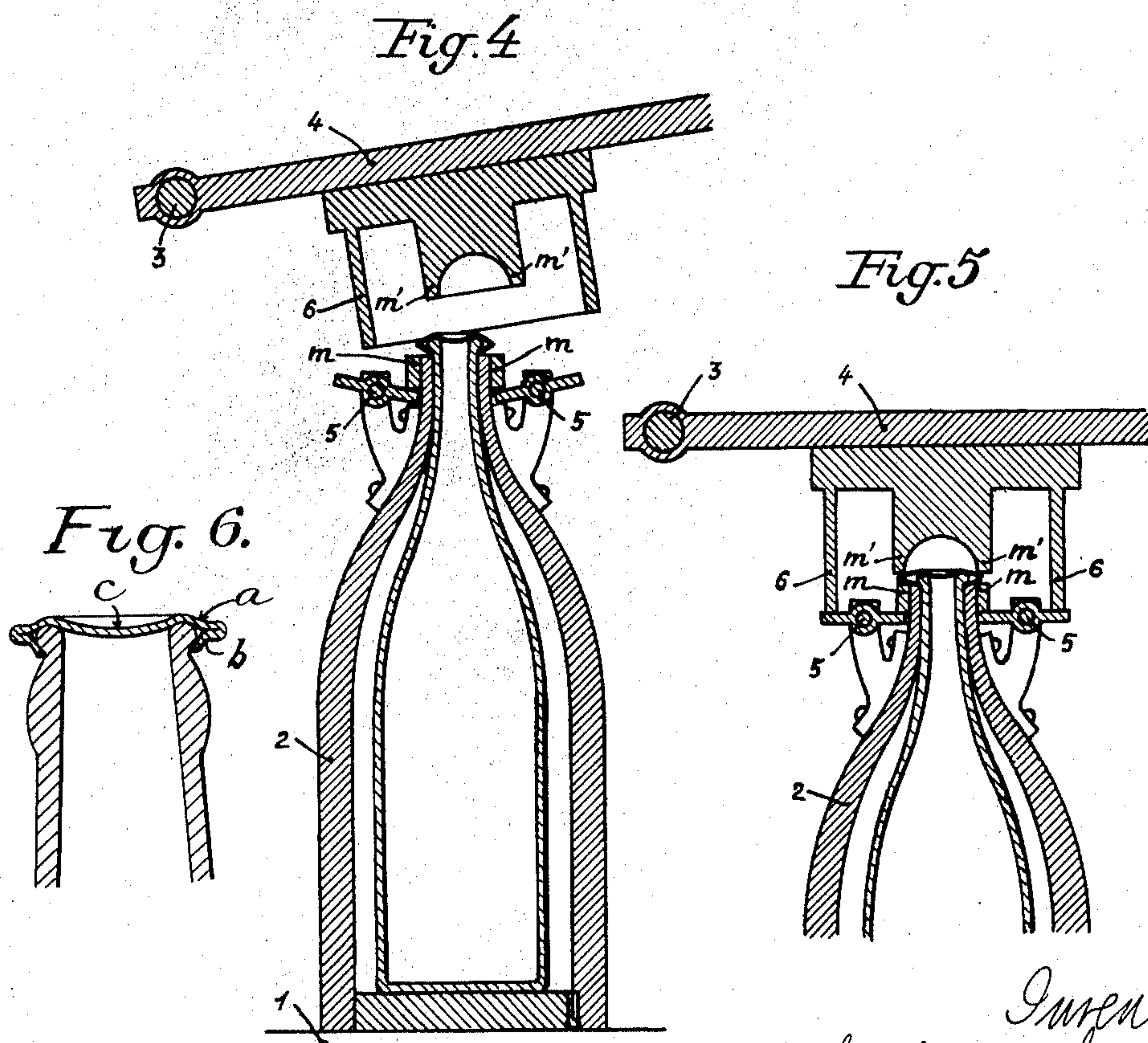
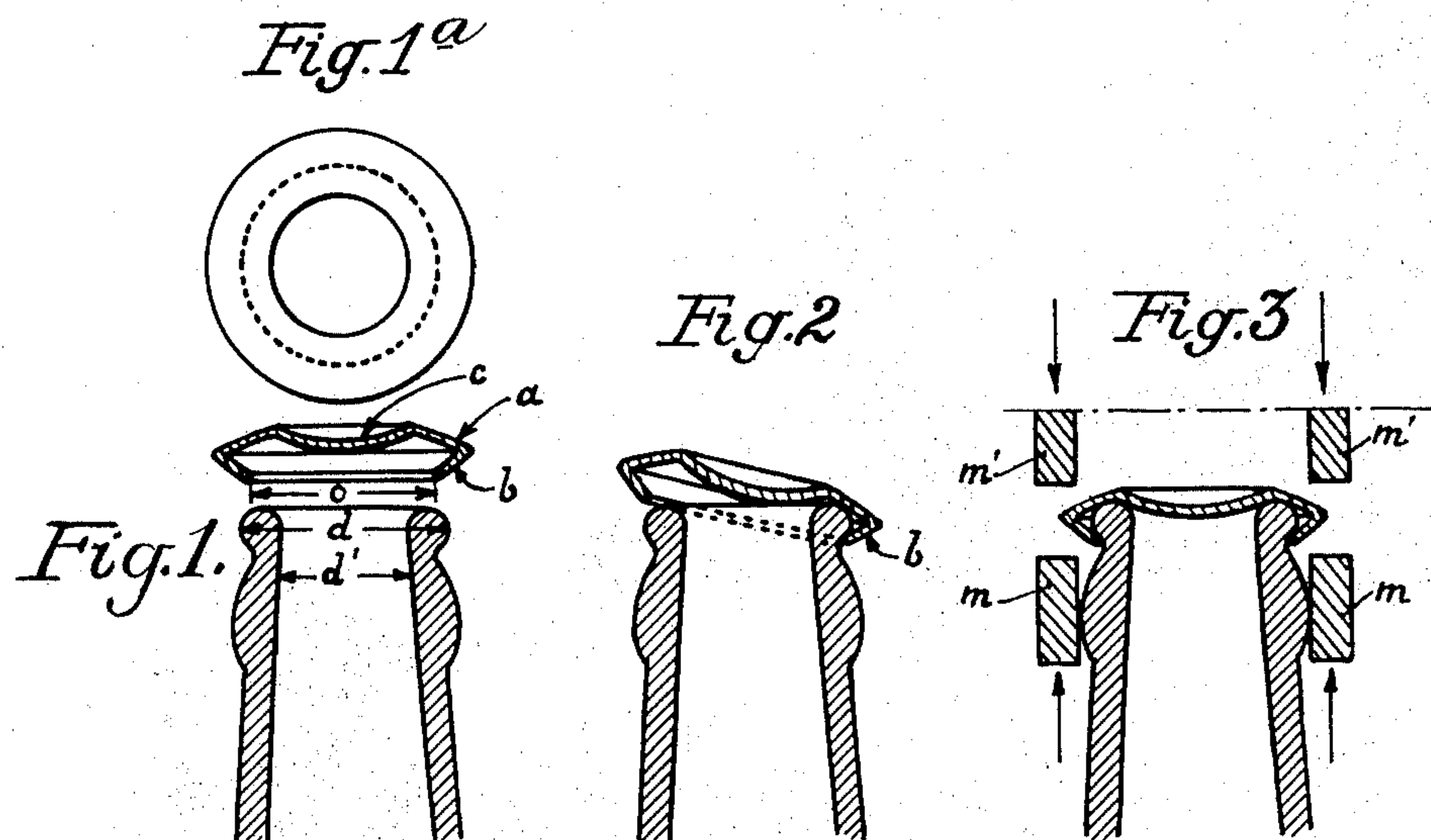
June 5, 1934.

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1,961,872

STOP FOR BOTTLES BY METALLIC CAPSULES

Filed Sept. 4, 1931



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UNITED STATES PATENT OFFICE

1,961,872

STOP FOR BOTTLES BY METALLIC CAPSULES

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Application September 4, 1931, Serial No. 561,287
In Belgium September 4, 1930

2 Claims. (Cl. 215—39)

The present invention relates to capsules for bottles and its object is to devise capsules superior to those known hitherto.

The calibre of the closing cordon of bottle-necks being never absolutely regular, the actual stopping capsules are adjusted on this cordon either by setting or by plaiting, and the setting or plaiting effort exerted radially upon the border of the capsule is supported directly by the neck giving rise to breaks amounting to about 10%. This break of bottles used for example for liquids presenting an insignificant intrinsic value, such as mineral waters, constitutes a sensible increase of the working cost of stopping; for liquids of higher value, such as wines, cider, champagne wines and so on, this break, to which other drawbacks of the metallic capsules must be added, excludes the use of this mode of stopping. On the other hand the actual capsules cannot resist tightly pressures of gas of several atmospheres employed for the champagne wines, for cider and so on. Finally the capsule is deformed or torn when opening the bottle, and consequently does not permit of re-employment. The invention has for its main object a new metallic capsule avoiding completely the break of bottles, supporting tightly pressures which are relatively great, permitting further its removal from the bottle even by hand and without any sensible deformation, as well as its re-mitting by hand and allowing of being used subsequently several times, while assuring at each time the required tightness. The new capsule can be used for stopping of bottles containing any liquid or beverage and permits of removal and re-mitting similarly to a cork-stopper, the scope of employment of metallic capsules being, owing to these features, considerably widened.

The capsule forming subject-matter of the present invention is mainly characterized by that its inner border (or closing lip) destined to seize the cordon of the bottle-neck, does not follow exactly the outline of this cordon but keeps away from the same sensibly in a very inclined direction and joins in a sharp angle the equally inclined border of the upper part of the capsule, the peripheral diameter of the latter being consequently much greater than the outer diameter of the neck-cordon. In consequence the border or the lower lip of the capsule and its upper border form between them a sharp angle whose summit is distant from the neck-cordon, and may therefore be drawn nearer to each other by squeezing of the two movable jaws parallelly to the axis of the bottle; the effort

being exerted upon an annular zone of the capsule, situated outwardly with regard to the cordon.

It is obvious that under these conditions the neck of the bottle does not undergo directly any squeezing effort and that thereby all break is avoided.

Another feature of the capsule consists in that its upper part or the obturating wall of the capsule is lowered or depressed in its center toward the basis so as to form, together with the inner border of the bottle-neck, a conical closing joint; it is well known that joints of this kind are superior to flat joints and secure a better tightness.

The foregoing features of the new capsule can be advantageously combined with a known disposition, according to which the diameter of opening of the capsule between the seizing lips is slightly smaller than the outer diameter of the bottle-neck, so that the fitting of the capsule requires two combined movements of the capsule with regard to the neck, viz. an oblique sliding motion for engaging one side of the capsule over the cordon, and another swinging motion for applying the opposite side of the capsule against the neck and perfecting the fitting. This disposition combined with the new form of the capsule, as defined above, permits to remove and to re-fit the capsule several times subsequently and by hand, securing in this manner to the capsule all advantages of a cork-stopper, without its drawbacks.

The invention comprises also a device or disposition for the stopping machine devised for setting or fitting and for squeezing of the new capsule. The invention comprises furthermore certain particularities enounced in the following description referring to the drawing appended which illustrate, in the way of an example, an executorial form of the subject-matter of the invention.

Fig. 1 is a sectional view of the neck of a bottle and of the capsule showing the capsule above the neck;

Fig. 1^a is a detail plan of the capsule;

Fig. 2 indicates the manner of its fitting by two conjugated sliding and swinging movements, for opening the bottle, and on supposition that, initially already, the lower diameter of the capsule is lesser than that of the neck-cordon;

Fig. 3 represents the capsule fitted to the bottle;

Fig. 4 and Fig. 5 indicate summarily a device for the stopping machine, in two different positions; and

Fig. 6 is a detail sectional view similar to Fig. 3 and showing the bottle neck with the capsule cap applied and sealed.

The capsule comprises, as shown in Fig. 1, in axial section, a strongly inclined border *a* or wall, and an inclined lip or border *b* approaching the axis in an equally very inclined direction so as to include with the wall *a* a very pronounced angle which is generally a sharp one; the width *o* between the lips *b* is of a diameter slightly lesser than the outer diameter *d* of the seizing cordon of the bottle-neck. Besides, the upper part of the capsule is sunk downwardly at *c* so as to form a little basin or cap. In this manner the joint is perfect.

In fact, the joint between the tightening layer *g* (india-rubber, cork, plastic matter and so on) placed in the usual manner in the interior of the capsule, and the neck itself will be effected in the way of a conical joint between the basin *c* and the inner border of the neck.

The capsule must not be necessarily provided according to the invention with an aperture *o* smaller than the diameter *d* of the cordon or collar; in case of this diameter being the same or slightly superior, no special precaution is required for fitting of the capsule. In the preferred case of this diameter *o* being, as shown, slightly smaller than *d*, the fitting is effected by conjugated movements of horizontal or inclined sliding and of swinging, as indicated in Figures 2 and 3. To begin with, the capsule is pushed horizontally and in an inclined position, as shown in Fig. 2, so as to engage the seizing lip *b* over the cordon or collar of the bottle, on one side of the same; thereupon the capsule is swung around the so established supporting point and the remaining peripheral part of the seizing lip is forced to pass over the collar, so that the capsule arrives into its final position, as shown in Fig. 3.

After fitting the squeezing or quenching of the capsule is effected by nipping its walls *a*, *b* between annular jaws *m* and *m'* (shown summarily in Fig. 3) drawn near to each other parallelly to the axis of the neck, as indicated by arrows in Fig. 3.

The inner diameter of these jaws is greater than the diameter *d* of the neck-collar so that the squeezing action does not exert itself directly upon the collar itself but acts upon the parts *a* and *b* so as to diminish still, outwardly of the collar, the sharp angle formed between these parts. The squeezing of the said parts of the capsule (of the upper and inner border) parallelly to the axis of the collar and at a small distance from the same, avoids all break of the bottle; simultaneously the following effects are produced: 1, the aperture *o* of the capsule is reduced and consequently a perfect fit or adjustment or calibration of the same with regard to the collar is secured; 2. the upper part (together with its tightening means *g*) is applied against the upper portion of the bottle-neck, viz. a tight joint, analogous to the conical joint, is secured between the upper deepened central part of the capsule and the inner entry of the neck.

The squeezing of the parts *a*, *b* of the capsule between the movable jaws can be secured of course by any suitable means, the following device, shown in Figs. 4 and 5, being indicated merely in the way of an example:

On the table 1 of a stopping machine of any kind reposes a metallic support 2 sufficiently resistant and assuming in the embodiment represented the shape of a bottle greater and wider

than the bottle to be stopped. Laterally the support is open so as to permit introduction of the bottle to be stopped, the upper collar of its neck surpassing the height of the support 2.

The support carries an annular abutment *m* made in one piece with the support or attached thereto in any suitable way, for example movable on it, as indicated on the drawing and described further on. At the other part, to a fixed point 3 of the capsulating machine is articulated a lever 4 carrying the upper annular jaw *m'* destined to squeeze the border of the capsule between this jaw and the lower jaw *m*. In the example shown, it is supposed that the lower jaw *m* is movable in the sense of the axis of the neck and that it is displaced by small levers 4 pivoting at 5 on the support 2 and acted upon by arms 6 mounted on the lever 4 carrying the upper jaw *m'*. It is visible that with this device the lowering of the lever is followed by the raising of the jaw *m* and simultaneously by the lowering of the jaw *m'*.

The lever can be arranged so as to effect itself, after previous to the squeezing of the capsule, its placing on the collar; a channel can be provided in the lever for guiding the capsules, one by one, over the bottles to be stopped and situated in the support 2, distributed preferably in a sufficient number on the periphery of a circular rotating table 1 of the capsulating machine. In this way the rotation of the table and the lowering and raising movement of the lever 4 permit to obtain an automatic stopping machine working rapidly and continuously, the bottles to be stopped being placed one by one in successive supports previous to passing below the lever, and being removed on the opposite side of the rotary table.

Such mode of squeezing of the new capsule presents, besides avoiding all break, the particular advantage of adapting the capsule exactly to the bottle-neck notwithstanding the differences of calibres of different necks, owing to the elasticity intercalated so to say between the squeezing jaws and the cordon or collar of the bottle. Besides, it is possible, according to the invention, to intercalate between the capsule and the neck, as replacement of the tightening layer *g* or, what is preferable, in addition to the same, a thin leaf of tin, aluminum and so on, which is larger than the aperture of the capsule, so as to head the collar and to adapt itself to it and to descend deeper than the collar after stopping the bottle. On squeezing the borders of the capsule, the leaf compensates the differences of calibration of different necks by introducing itself between the lip *b* and the neck-collar in case of the neck-collar being too small, and will be cut accordingly under the action of the lip *b* in case of the neck-calibre being greater.

It is to be understood that the different features of the new capsule can be employed either separately or in combination, without surpassing the scope of the invention. The dimensions of the capsule with respect to the neck may vary; a suitable shape of the capsule will be obtained by making its diameter 6 to 8 mm. greater than that of the collar of the neck.

Essays have proved that the capsule constituted in this manner is susceptible of resisting to very high pressures very superior to those of ciders and sparkling wines, and in a perfect tight manner; nevertheless the capsule may be removed without being spoiled, and may be used subsequently several times with all required

tightness, in case of emergency with aid of hand without help of any tool. The widened shape of the capsule lends itself in the best possible way for its swinging by hand.

5 The new shape of the capsule secures at the same time an esthetic aspect suiting perfectly for crowning of the neck.

What I claim is:

10 1. A capsule for closing a bottle having a bead around its mouth, said capsule having a central portion to bear on the mouth of the bottle and provided with a radially extending downwardly inclined edge portion to project radially from the bottle mouth and a downwardly inclined in-
15 wardly extending lower flange united to said

first mentioned edge portion and adapted to bear at its inner edge under said bead, said edge portion and said lower flange being adapted to be pressed toward each other to tightly grip the bead of the bottle between them, which increases the diameter of the capsule as to adapt the same to be readily grasped by the hand and de-
80 tached from the bottle.

2. A capsule as claimed in claim 1, in which the central portion is concavo convex with its convex side undermost and arranged to bear against the inner side of the wall of the bottle mouth.
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