

Feb. 24, 1953

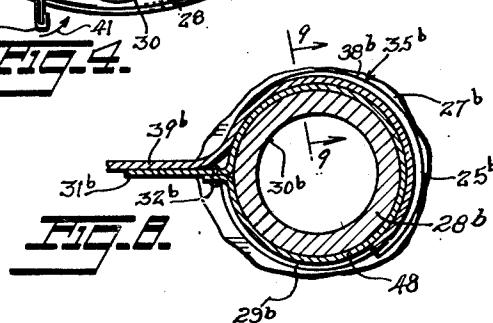
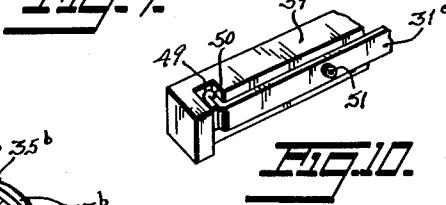
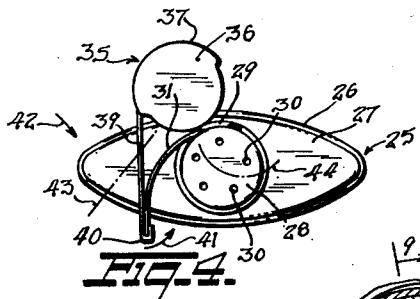
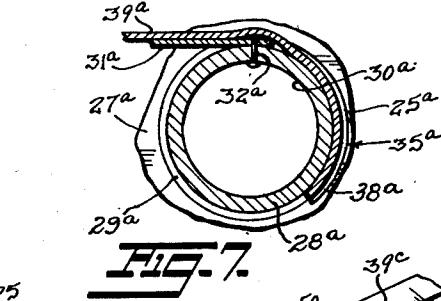
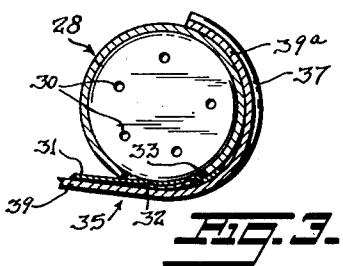
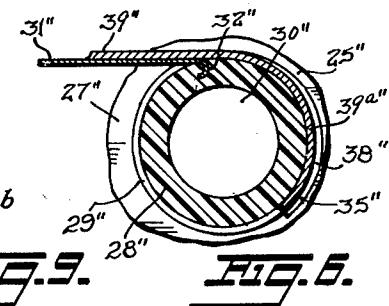
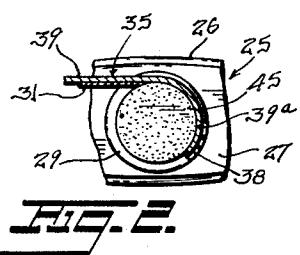
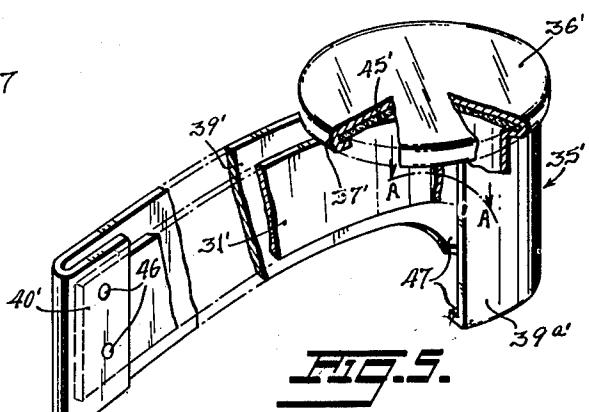
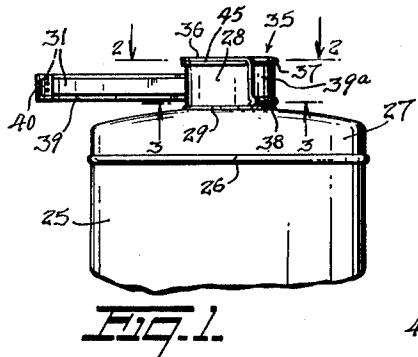
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2,629,518

SELF-CLOSING AND SEALING CONTAINER CAP

Filed June 16, 1949

3 Sheets-Sheet 1



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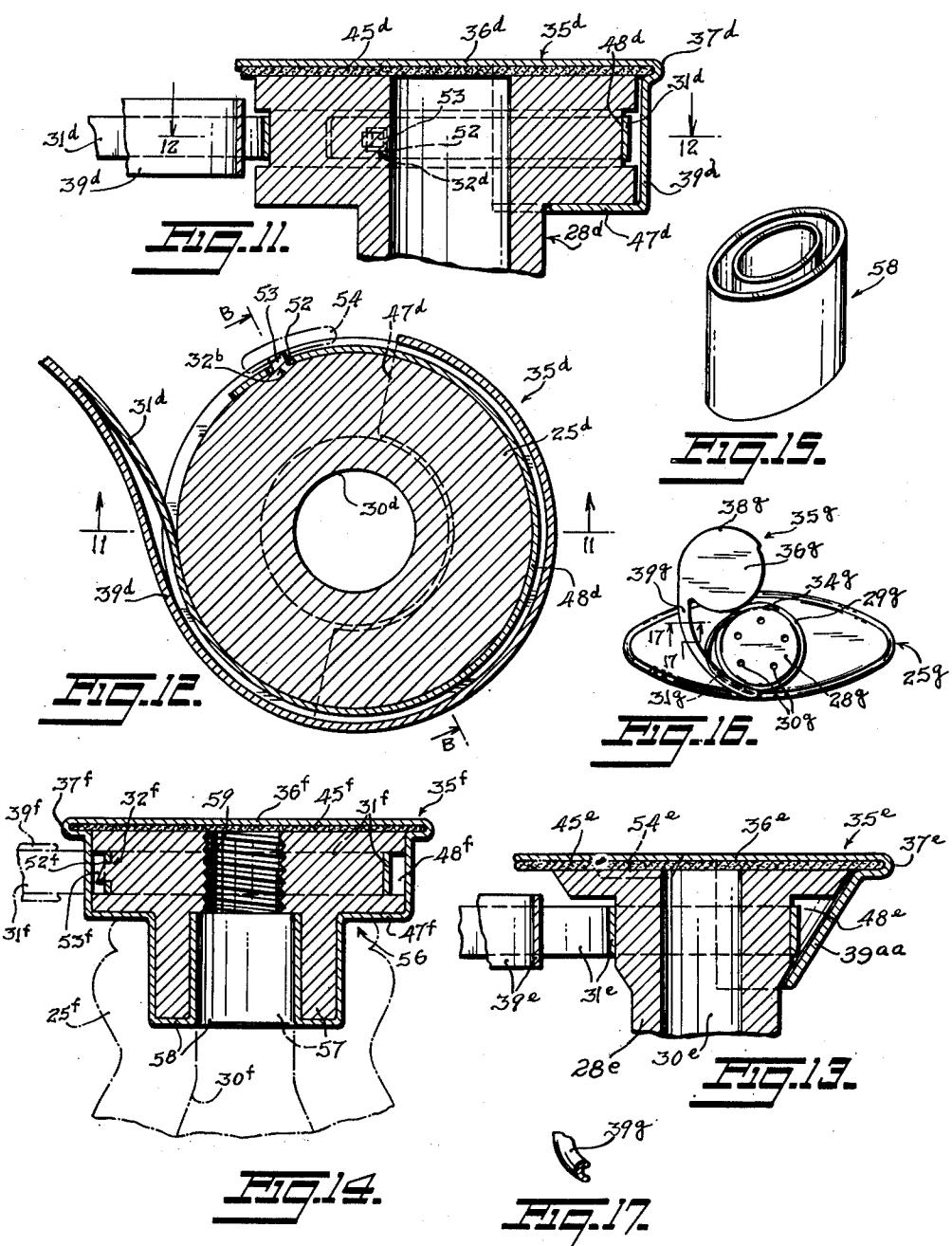
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SELF-CLOSING AND SEALING CONTAINER CAP

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3 Sheets-Sheet 2



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SELF-CLOSING AND SEALING CONTAINER CAP

Filed June 16, 1949

3 Sheets-Sheet 3

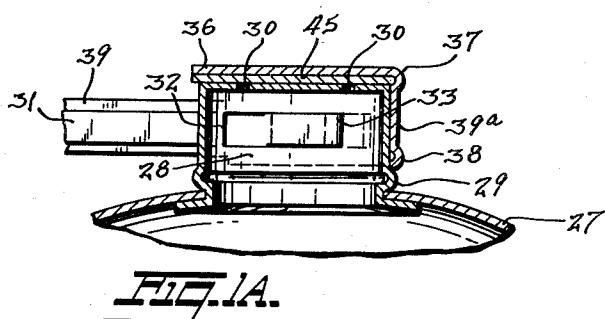


FIG. 1A.

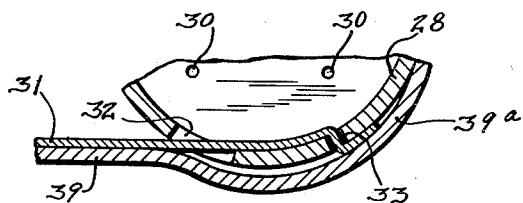


FIG. 3A.

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UNITED STATES PATENT OFFICE

2,629,518

SELF-CLOSING AND SEALING CONTAINER
CAP

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Application June 16, 1949, Serial No. 99,393

9 Claims. (Cl. 222—517)

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This invention relates to new and useful improvements in readily openable closure means for receptacles and containers, and, more particularly, the aim is to provide a novel and valuable such means which while in use and between periods of temporary opening for dispensing may be permanently carried by the container or the like, yet is easily elastically openable when desired, and which is, fundamentally, characterized by the inclusion of an improved spring instrumentality for normally urging the cap to closed condition. This spring instrumentality, below called the spring, is of easily fabricated and assembled leaf spring type, is exceedingly simple and inexpensive, and, essentially, is present in such a way that previous complexities are obviated, these latter due to attempts to house the entirety of a spring inside the cap.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 side elevationally illustrates one now favored embodiment of the invention, with the cap closed, and with the container, this shown fragmentarily, constituting, for example, a familiar kind of talcum powder container having a sifter top.

Fig. 1A is an enlarged partial vertical sectional view of Fig. 1.

Fig. 2 is a fragmentary horizontal section, taken on the line 2—2 of Fig. 1.

Fig. 3 is a similar view, on an enlarged scale, taken on the line 3—3 of Fig. 1.

Fig. 3A is an enlarged view of a portion of Fig. 3.

Fig. 4 is a top plan view, showing the cap moved for fully opening said sifter top.

Fig. 5 is a very much enlarged perspective view, partially broken away and partially in section, of an embodiment similar to that of Figs. 1—4, but with the cap having a bottom arcuate flange for assisting optimum behavior as to cap closing where the container at a neck portion has an annularly grooved or undercut conformation.

Figs. 6, 7 and 8, each enlarged to about the scale of Fig. 3, and all sections as though taken on a line having a locus about corresponding to that of the line A—A of Fig. 5, are views illustrative of some of the many and widely different possible methods of attachment, to a container, of the end of the spring which is to be fixed relative to the container.

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Fig. 9 is a detail section, taken on the line 9—9 of Fig. 8.

Fig. 10 is an enlarged fragmentary perspective view, illustrating one of the many possible and widely different ways, in addition to that shown in Figs. 1—4, of coupling the outer end of the spring to an offset extension from the main body of the cap for constituting a finger-piece or manually swingable operating arm to move the cap to dispensing relation with the container.

Figs. 11 and 12, both very much enlarged, are illustrative of another of the many possible and widely different ways in which the closing means of the invention may be embodied; these views being, respectively, a fragmentary vertical section taken on the line 11—11 of Fig. 12, and a horizontal section taken on the line 12—12 of Fig. 11.

Fig. 13 is illustrative of a means of applying the invention, where the container top is exteriorly of downwardly tapering conical shape; this view, somewhat enlarged, being a section as though taken on a line having a locus about corresponding to that of the line B—B of Fig. 12.

Figs. 14 and 15 illustrate, by way of further example of the multitudinous and different ways in which the invention may be carried out, a closure means according to the invention of a kind adapted to be attached, say, to a bottle top, and at the same time so constituted, if desired, to adapt the attachment for addition to the externally threaded extrusion neck of a flexible tube such as commonly is used for dispensing tooth paste, shaving cream, an unguent or the like; these views, much enlarged, being respectively a section as though also taken on a line having a locus about corresponding to that of the line B—B of Fig. 12, and a perspective view of an element also seen in Fig. 13.

Fig. 16 is a view similar to Fig. 4, but illustrating how a modification of, for example, that form of the invention may be readily had for constituting a safety means against accidental snap-breakage of the spring for protecting a child tempted to play with the container.

Fig. 17 is a fragmentary detail section, taken substantially on the line 17—17 of Fig. 16.

Referring now to the drawings more in detail, and by reference numerals, but first to Figs. 1—4, the container here shown at 25 is as has been stated of a familiar sifter top kind having a bead 26 around the top of the main body 25 of the container. The upper portion of the container is closed by a pressed-on cap 27 centrally apertured to have secured thereto in ways familiar in the can making art a sifter top 28 having a basal

flange 29 and at its roof wall pierced to provide a plurality of sifter holes 30. Whenever in the attached claims an opening is specified, there is meant either a single opening or a plurality of grouped openings or apertures such as the holes 30 or an equivalent.

A spring member 31 is attached to the side of the sifter top 28 by having its end extended through an opening 32 and then bent to pass out of the top 28 through a second opening 33, see Figs. 1A and 3A. This spring 31 is for coacting in a manner to be understood in a moment with the other main component of the new closure means, which latter is a shell structure 35. Included in this shell structure 35 is a circular top wall or hood 36, attended over a part of its circumference by a C-shaped formation 37. At its bottom the shell structure 35 has a basal bead 38, of a length equal to and vertically aligned with said formation 37; these two elements 37 and 38 are integrally formed along the top and bottom edges of the shell's side wall 39^a of arcuate cross-section.

Lining the inner face of the top wall 36 there is a liner 45 which has a portion of its peripheral edge clamped in the C-shaped formation 37, see Fig. 1A.

The aforesaid operating arm 39 is shown in this instance as integral with the side wall 39^a, the elastic uniplanar bias of the spring 31 causing it elastically to lie flat against the adjacent side of the arm 39. With the spring 31 thus extending along the length of the arm 39, any desired means may be employed to secure an outer portion of the arm to an outer portion of the spring. According to the expedient here shown, the outer end 40 of the arm 39, see particularly Fig. 4, is folded over on itself, the outer end of the spring extends into such fold, and the fold is clenched tight.

Normally, the parts are dependably held as in Fig. 1. When, however, the contents of the can or the like are to be dispensed, this by uncovering the holes 30, all that is required is to press on the arm in the direction of the arrow 41 of Fig. 4, with this pressure applied say by the left forefinger as the container 25 is gripped in the left hand with the thumb of that hand pressing in the direction of the arrow 41. When these opposing pressures are released, the parts snap back to the condition shown in Fig. 1. The holes 30 may, if desired, be opened only as to some of them; in which connection it is explained that if say the pressure is applied to swing the arm 39 only to the extent indicated by the dot and dash lines 43 of Fig. 4, the hood or top wall 36 will be swung only to the extent indicated by the arcuate dot and dash line 44.

Referring to Fig. 5, wherein the parts to which are applied reference numerals with a prime (') added correspond, respectively, to the parts to which have been applied the same reference numerals without primes, the variation illustrated here is the addition of rivets 46, and the substitution, arcuately of the bottom of the shell, of a flange 47, for the bead 38. This flange is desirable where a part corresponding to the sifter top 28 of Figs. 1-4 has, at a lower place along its height, an annular groove or a formation presenting a downwardly facing circumferential shoulder.

For securing a tight closure of said "opening," a gasket or liner 45' is secured in the shell as shown. This liner is made of a suitable natural material, as rubber, cork or the like, or of a suit-

able composition; having an appreciable degree of compressibility.

Referring to Fig. 6, wherein the parts to which are applied reference numerals with double prime (") added correspond, respectively, to the parts to which have been applied the same reference numerals but without such an addition, this shows another practicable one of the many possible ways of anchoring the inner end of the spring. Here the sifter top 28^{''} affording the spill opening 30^{''} may be assumed to be plastic; and the inner end of the spring 31^{''} is bent into a hook portion 32^{''} and there embedded in the plastic body.

Referring to Fig. 7, wherein the parts to which are applied reference numerals with the suffix "a" added correspond, respectively, to the parts to which have been applied the same reference numerals but without such an addition, this shows another practicable one of the many possible ways of anchoring the inner end of the spring. Here the sifter top 28^a, which may be of any material but is shown as of some thickness, although it need not be one of such thickness, has the inner end of the spring 31^a riveted as at 32^a to said neck, with said neck slotted to present a flat bottom groove as indicated in this view, this for keying the spring against rocking relative to the shank of the rivet.

Referring to Figs. 8 and 9, wherein the parts to which are applied reference numerals with the suffix "b" added correspond, respectively, to the parts to which have been applied the same reference numerals but without such an addition, here there is shown still another practicable one of the many possible ways of anchoring the inner end of the spring. The sifter top 28^b is shown as having a circumferential groove 48, and an end portion of the spring 31^b is curled around in said groove to be seated therein, and then secured as by the rivet 32^b.

Various other ways of satisfactorily anchoring the inner end portion of the spring may be mentioned, such as nipple and groove, abutment, notch and other types; but to illustrate all these would objectionably add to the drawings.

Referring to Fig. 10, wherein the parts to which are applied reference numerals with the suffix "c" added correspond, respectively, to the parts to which have been applied the same reference numerals but without primes, another of the various possible ways of positively attaching the outer end portion of the spring 31^c to the outer end portion of the operating arm 39^c is illustratively shown—especially when, as may be very convenient, said arm is made of a plastic. Near its outer end the arm may have a recess 49, for nesting therein the doubly bent outer end 50 of the spring; with the arm also desirably pierced for use of a tubular rivet 51 as indicated.

Referring to Figs. 11 and 12, wherein the parts to which are applied reference numerals with the suffix "d" added correspond, respectively, to the parts to which have been applied the same reference numerals without such suffix, these views illustrate, for one thing, still another suitable way of anchoring the inner end of the spring. The neck or the like 28^d, which may be, for instance, of a plastic, or of glass or the like, and having a circumferential groove 48^d, may have in such groove an outwardly extending lug 53 for being encompassed by an aperture 52 in the spring. For another thing, this embodiment illustrates a more practicable U-flange 75 for pocketing the gasket or liner 45^d, than as

shown in Fig. 5 relative to the gasket 45'. This C-shaped formation 37^a is a replica of the formation 37 of Figs. 1-4.

Referring to Fig. 13, wherein the parts to which are applied reference numerals with the suffix "e" added correspond, respectively, to the parts to which have been applied the same reference numerals without such suffix, here a design is shown well adapted for use in connection with a neck 28^e or the like, as one molded of glass or of a plastic, which exteriorly is of downwardly tapered conical shape. Such design, in view of the conicity of the side wall 39^{aa} of the shell 35^e, allows the elimination of a bottom flange corresponding to the flange 38 of Figs. 1-4, yet with all the advantages of such flange. The spring 31^e is here shown as encircling a circumferential groove 48^e around the tapered part of the neck; such groove desirably having a cylindrical bottom wall to avoid unnecessary twist of the spring. The spring can have its inner end anchored in any suitable way, as in any of the ways already described where appropriate to the shape and material of the neck 28^e. The arm 39^e will, of course, where it merges with said side wall, if these two elements are integral parts of the shell 35^e, have to be given a appropriate twist or partial twist.

Referring to Figs. 14 and 15, wherein the parts to which are applied reference numerals with the suffix "f" added correspond, respectively, to the parts to which have been applied the same reference numerals without such suffix, the part corresponding to the neck or the like and here marked 56, made say of a plastic, glass or any suitable composition, is in the form of a separate attachment to any one of a variety of containers having a neck structure through which extends a passage leading to the spill "opening."

For taking care of the case where said container is, for instance, a glass bottle such as indicated at 25^f, said attachment 56 could have a reduced depending extension 57 of annular cross-section to provide a central channel properly matching the opening 30^f of the container; such extension to be downwardly inserted into the container as illustrated. For suitable tightness of joint between the container and the exterior of said extension, said extension could carry, and for dependable hold thereon, a boot such as shown. This boot, designated 58, may be of molded rubber or the like.

Further, for taking care of the case where said attachment is desired to be applied to the reduced neck of a flexible tube having an extrusible substance therein, the main upper disk-like portion of the attachment 56 may have therethrough and centrally thereof a spill opening carrying an internal thread 59, this thread matching the standard exterior thread on said neck of said flexible tube for normally carrying the easily lost screw-cap furnished with the tube.

Referring to Figs. 16 and 17, wherein the parts to which are applied reference numerals with the suffix "g" added correspond, respectively, to the parts to which have been applied the same reference numerals without such suffix, there is here shown, finally, an arrangement like that of Figs. 1-4, but with the arm 39^g longitudinally curved, and desirably also of U-shaped cross-section as indicated in Fig. 17, as a safety measure as aforesaid. A child, or even a careless adult, cannot so stress the spring 31^g, in this arrangement, sufficiently to cause snap-breakage thereof.

While I have illustrated and described the pre-

ferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

- 10 1. In a container having an upstanding neck formed with a top discharge opening, a closure comprising a shell structure having a top wall positioned on top of the neck closing the discharge opening and a depending arcuate side wall extending along one side of the neck, an elongated leaf spring having one end fixedly secured to the side of the neck at one end of said side wall with its width disposed vertically and having its other end projecting tangentially away from the neck, and an arm integral with the said one end of said side wall and projected tangentially along in face contact with one side of said leaf spring, said arm having its free end secured to the outer end of said leaf spring retaining said shell structure in a position in which its top wall closes the discharge opening.
- 15 2. In a container having an upstanding neck formed with a top discharge opening, a closure comprising a shell structure having a top wall positioned on top of the neck closing the discharge opening and a depending arcuate side wall extending along one side of the neck, an elongated leaf spring having one end fixedly secured to the side of the neck at one end of said side wall with its width disposed vertically and having its other end projecting tangentially away from the neck, and an arm integral with the said one end of said side wall and projected along and in face contact with one side of said leaf spring, said arm having its free end secured to the outer end of said leaf spring retaining said shell structure in a position in which its top wall closes the discharge opening, and a bead formed along the bottom edge of said side wall.
- 20 3. In a container having an upstanding neck formed with a top discharge opening, a closure comprising a shell structure having a top wall positioned on top of the neck closing the discharge opening and a depending arcuate side wall extending along one side of the neck, an elongated leaf spring having one end fixedly secured to the side of the neck at one end of said side wall with its width disposed vertically and having its other end projecting tangentially away from the neck, and an arm integral with the said one end of said side wall and projected along and in face contact with one side of said leaf spring, said arm having its free end secured to the outer end of said leaf spring retaining said shell structure in a position in which its top wall closes the discharge opening, and an inwardly directed flange formed along the bottom edge of said side wall.
- 25 4. In a container having an upstanding neck formed with a top discharge opening, a closure comprising a shell structure having a top wall positioned on top of the neck closing the discharge opening and a depending arcuate side wall extending along one side of the neck, an elongated leaf spring having one end fixedly secured to the side of the neck at one end of said side wall with its width disposed vertically and having its other end projecting tangentially away from the neck, and an arm integral with the said one end of said side wall and projected along and in face

contact with one side of said leaf spring, said arm having its free end secured to the outer end of said leaf spring retaining said shell structure in a position in which its top wall closes the discharge opening, said arm having its free end bent about and clenched to the said other end of said leaf spring forming the securing means for the free end of said arm.

5. In a container having an upstanding neck formed with a top discharge opening, a closure 10 comprising a shell structure having a top wall positioned on top of the neck closing the discharge opening and a depending arcuate side wall extending along one side of the neck, an elongated leaf spring having one end fixedly secured to the side of the neck at one end of said side wall with its width disposed vertically and having its other end projecting tangentially away from the neck, and an arm integral with the said one end of said side wall and projected along and in face contact with one side of said leaf spring, said arm having its free end secured to the outer end of said leaf spring retaining 15 said shell structure in a position in which its top wall closes the discharge opening, said arm having its free end bent about and clenched to the said other end of said leaf spring forming the securing means for the free end of said arm, and rivets engaged through the said other end of said leaf spring and the free end of said arm bent about the said other end of said leaf spring.

6. In a container having an upstanding neck formed with a top discharge opening, a closure comprising a shell structure having a top wall positioned on top of the neck closing the discharge opening and a depending arcuate side wall extending along one side of the neck, an elongated leaf spring having one end fixedly secured to the side of the neck at one end of said side wall with its width disposed vertically and having its other end projecting tangentially away from the neck, and an arm integral with the said one end of said side wall and projected along and in face contact with one side of said leaf spring, said arm having its free end secured to the outer end of said leaf spring retaining said shell structure in a position in which its top wall closes the discharge opening, said one end of said leaf spring being bent to extend into and out of adjacent openings formed in the neck forming the means securing said one end of said leaf spring to the neck.

7. In a container having an upstanding neck formed with a top discharge opening, a closure comprising a shell structure having a top wall positioned on top of the neck closing the discharge opening and a depending arcuate side wall extending along one side of the neck, an elongated leaf spring having one end fixedly secured to the side of the neck at one end of said side wall with its width disposed vertically and having its other end projecting tangentially away from the neck, and an arm integral with the said one end of said side wall and projected along and in face contact with one side of said leaf spring, said arm having its free end secured to the outer end of said leaf spring retaining

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said shell structure in a position in which its top wall closes the discharge opening, said securing means for the one end of said leaf spring, comprising a rivet passed through said one end of said leaf spring and the neck.

8. In a container having an upstanding neck formed with a top discharge opening, a closure comprising a shell structure having a top wall positioned on top of the neck closing the discharge opening and a depending arcuate side wall extending along one side of the neck, an elongated leaf spring having one end fixedly secured to the side of the neck at one end of said side wall with its width disposed vertically and having its other end projecting tangentially away from the neck, and an arm integral with the said one end of said side wall and projected along and in face contact with one side of said leaf spring, said arm having its free end secured to the outer end of said leaf spring retaining said shell structure in a position in which its top wall closes the discharge opening, said one end of said leaf spring being bent into a hook portion and embedded into the neck forming the means securing the said one end of said leaf spring to the neck.

9. In a container having an upstanding neck formed with a top discharge opening, a closure comprising a shell structure having a top wall positioned on top of the neck closing the discharge opening and a depending arcuate side wall extending along one side of the neck, an elongated leaf spring having one end fixedly secured to the side of the neck at one end of said side wall with its width disposed vertically and having its other end projecting tangentially away from the neck, and an arm integral with the said one end of said side wall and projected along and in face contact with one side of said leaf spring, said arm having its free end secured to the outer end of said leaf spring retaining said shell structure in a position in which its top wall closes the discharge opening, said one end of said leaf spring being bent to encircle the neck and secured to itself by a rivet forming the means securing the said one end of said leaf spring to the neck.

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