Sept. 7, 1926. 1,598,612

H. T. KRAFT

CLOSURE

Filed Nov. 16, 1925

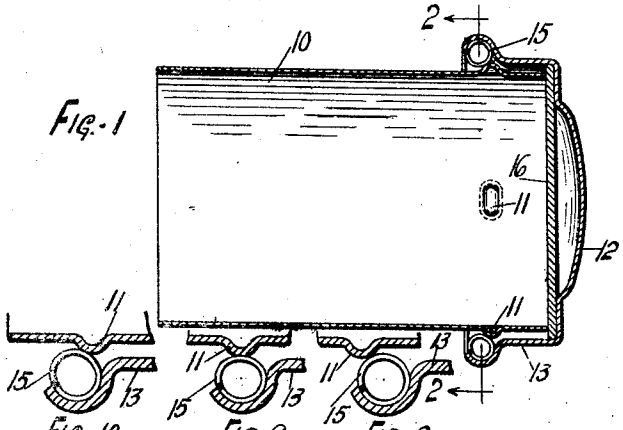


FIG.-1

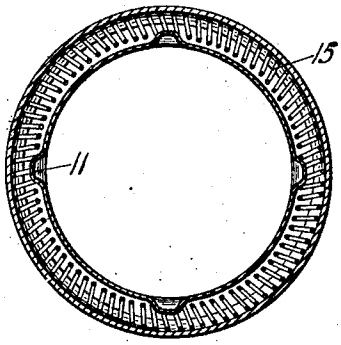


FIG.-2

FIG.-10 FIG.-9 FIG.-8.

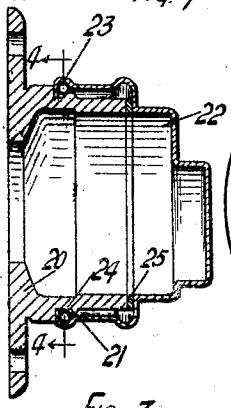


FIG.-3

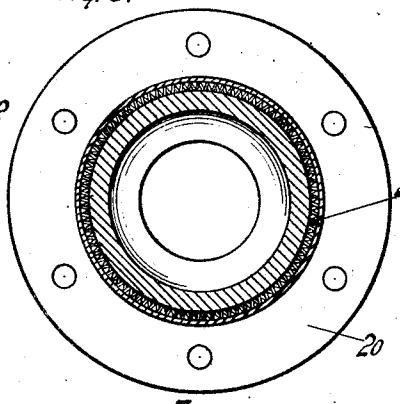


FIG.-4.

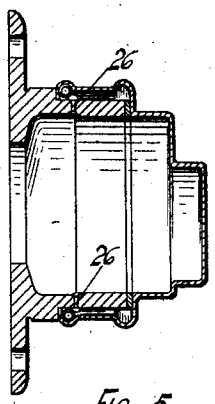


FIG.-5.

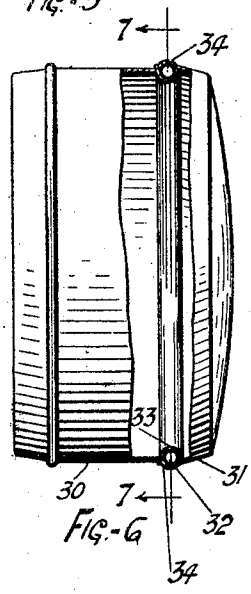


FIG.-6

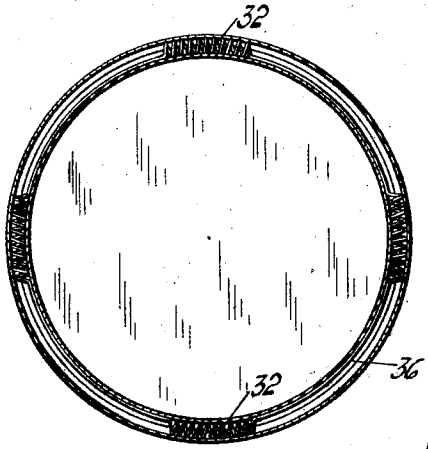


FIG.-7.

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CLOSURE.

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This invention relates to closures such as may be used for various purposes, the principles of which are applicable to numerous locations and may be used in a variety of ways.

The object of the invention is to provide a quick acting closure which will firmly and securely seat in position by forcing the closure telescopically inwardly upon a body member to its seat thereon where, due to the construction and operation of the device, it will be firmly and securely clamped. While the device has a large range of usefulness and may be embodied in different forms, there are shown herein only a few of such forms and applications, but it will be apparent that others may be devised within the scope of the invention as set forth in the description and claims forming a part hereof.

In the drawings in which several forms of the invention have been shown as applied to various parts of automobiles:

Figure 1 is a longitudinal section of one form of the invention as applied to filler spouts of gasoline tanks;

Figure 2 is a cross-section on the line 2—2 of Figure 1;

Figure 3 shows the invention as applied to a hub cap;

Figure 4 is a section on the line 4—4 of Figure 3;

Figure 5 is a further form of the invention as applied to a hub cap;

Figure 6 shows a form of the invention as applied to the retaining ring for a head light;

Figure 7 is a section on the line 7—7 of Figure 6; and

Figures 8, 9 and 10 are enlarged views showing the operation of the device and the manner in which the locking element operates and functions.

In the several forms of the invention as shown and as will be described and in other embodiments thereof as may be suggested to those skilled in the art, the locking element consists of a coiled spring which is seated within a confining and retaining channel upon one of the elements of the closure. The removable element of the closure is forced into position and in so doing the spring is deformed transversely from its normal cross-section to an elliptical cross-section, and upon forcing the closure to its final position, the spring tends to resume its normal cross-section. In the operation of the device, however, the spring is not completely restored to normal condition as the closure is so designed that it will seat before this occurs, and as a result the constant expansive force of the spring maintains the closure in tight clamping relation. In the making of closures which utilize a compressible gasket, this feature of the device secures a liquid or grease tight seal about the enclosure.

Referring to the specific forms of the invention, and particularly to Figures 1 and 2, the spout or filling nozzle of a gasoline tank is indicated at 10. Near the upper end of the spout are formed a plurality of lugs or short ridges 11. The closure or cap is indicated at 12, having an outer rim or flange 13. In the lower edge of the flange is formed a substantially semi-circular groove or channel in which is seated the locking element which is in the form of a continuous coil spring 15. It will be observed that as the cap or closure is pressed inwardly, the coil spring rides over the inclined lugs 11 and compresses the spring transversely, and as it passes over the lugs, the tendency of the spring to reassume its normal cross-section serves to draw the cap inwardly. This action not only makes a tight fitting cap, but also is used to obtain a fluid-tight closure in certain embodiments of the invention. In the interior of the cap is arranged a compressible gasket 16 which bears against the outer edge of the spout and forms the fluid-tight joint referred to.

The device is simple and inexpensive to manufacture and avoids the threading operations which have heretofore been considered necessary for these devices. It is easily put on and can be easily removed.

In Figures 3, 4 and 5, the invention is shown applied to a hub cap. Referring particularly to Figures 3 and 4, the hub plate is shown at 20, being provided with a continuous rib 21 about its outer periphery. The hub cap is shown at 22 and is formed about its inner edge with a continuous channel 23 in which the continuous coil spring 24 is seated. The grease-tight gasket, where this is used, is shown at 25. In the operation of the device the hub cap is pressed inwardly until the spring passes over the rib 21, whereupon the cap will be secured

in position, the expansive force of the spring holding the cap tightly in place with a grease proof seal.

In the form shown in Figure 5, the construction is substantially the same, the difference being that in place of the continuous rib 21, two rivets 26 are employed, the heads of which operate in substantially the same manner.

In applying the invention to hub caps, many advantages are obtained. The fine threading which has been required heretofore is eliminated, thereby reducing the cost of manufacture. The hub caps are more easily placed in position and stripping of the threads is avoided. It is not necessary to furnish a wrench with this type of hub cap, an ordinary screw driver being sufficient to loosen and remove the cap.

Figures 8, 9 and 10, respectively, illustrate the several successive stages of compression of the spring and need not be further described, the action being clearly indicated in the drawings, attention being called to the non-circular or elliptical cross-section of the spring in Figures 9 and 10.

In Figures 6 and 7 the invention is applied to a head light 30, the numeral 31 indicating the ring which holds the lens in position. In this form of the invention, the spring 32 is seated within a channel 33 on the body of the head light, while the ring is formed with an oppositely faced channel 34 which is forced over the spring. The lens is thus tightly held between the usual gaskets (not shown).

In this form of the invention it is not necessary to extend the coils of the spring about the entire circumference, the coils being formed for short spaces only, as shown in Figure 7, the several segments of coils being connected by uncoiled wire 36. This form of the invention is desirable where the extent of the spring would increase the expense, naturally, if carried about a large circumference. The action of the short sections of springs is the same as in the other constructions illustrated.

It will be observed that in the forms of the invention shown herein, particularly in Figures 1, 3 and 5, the formation against which the spring is forced by the application of the closure is tapered or inclined, so that as the cap is forced into position, the gradual incline will compress the spring transversely. This result could not be obtained with a device in which the spring abutted against a square shoulder as the closure was forced into position.

It is obvious that other changes and modifications may be made within the scope of the invention and such as embody the features thereof as set forth in the claims are intended to be covered herein.

What is claimed is:

1. A closure comprising a main or body member, a removable member adapted to telescope therewith, a channel formed in one of said members, a coil spring seated within the channel, a portion of the spring projecting outwardly from the channel, the other member being provided with a tapering formation adapted to compress the spring transversely as the two members are brought into telescoping position.

2. A closure comprising a main or body member, a removable member adapted to telescope therewith, a channel formed in one of said members, a coil spring normally circular in cross-section seated within the channel, a portion of the spring projecting outwardly from the channel, the other member having a formation thereon which is adapted to distort the coils of the spring to an elliptical cross-section as the two members are brought into telescoping position.

3. A closure comprising a main or body member, a removable member adapted to telescope therewith, a channel formed in one of said members, a coil spring normally circular in cross-section seated within the channel, a portion of the spring projecting outwardly from the channel, the other member having a formation thereon which is adapted to distort the coils of the spring to an elliptical cross-section as the two members are brought into telescoping position, the two members being in closed position while the spring is elliptical in cross-section.

4. A closure comprising a body member, a removable cap, a gasket within the cap, a rib about the body member, the cap being formed with a channel, a spring within the channel, the spring being normally circular in cross-section, but adapted to be compressed transversely as the cap is forced over the rib and the gasket contacting with the outer edge of the body member, the expansion of the spring thereby compressing the gasket against the body member.

5. A closure comprising a body member, a removable cap, a gasket within the cap, a projection upon the body member, the cap being formed with a channel, a spring within the channel, the spring being normally circular in cross-section, but adapted to be compressed transversely as the cap is forced over the projection and the gasket contacting with the outer edge of the body member, the cap being seated prior to the return of the spring to its normal condition whereby expansion of the spring compresses the gasket against the body member.

6. A closure comprising a body member and a removable member, a tapering formation upon one of the members, a channel upon the other member, a coil spring seated

within the channel, a gasket on one of said members, the spring being adapted to be compressed transversely by the formation and the gasket compressed between said members by the effort of the spring to regain its normal condition after the removable member is forced into position upon the body member.

7. A closure comprising a body member, a removable cap, a gasket within the cap, a projection upon the body member, the cap being formed with a channel, a spring within the channel, the spring being adapted to be compressed transversely as the cap is forced over the projection and the gasket contacting with the outer edge of the body member, before the spring returns to its normal condition whereby the expansion of the spring compresses the gasket against the body member.

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