

Oct. 7, 1930.

J. S. REID

1,777,768

CLOSURE STRUCTURE

Filed March 5, 1928

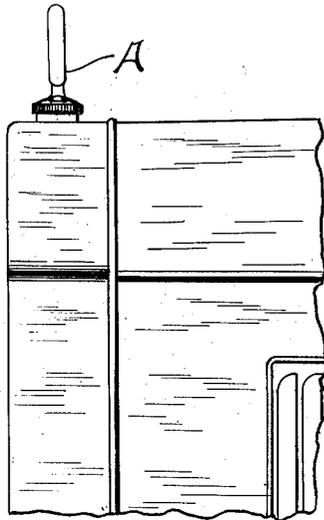


FIG-1

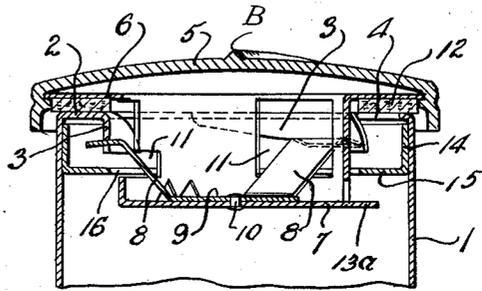


FIG-2

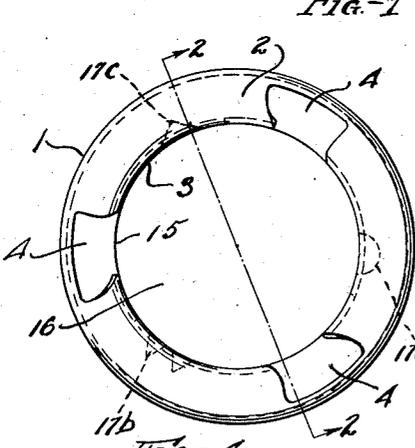


FIG-4

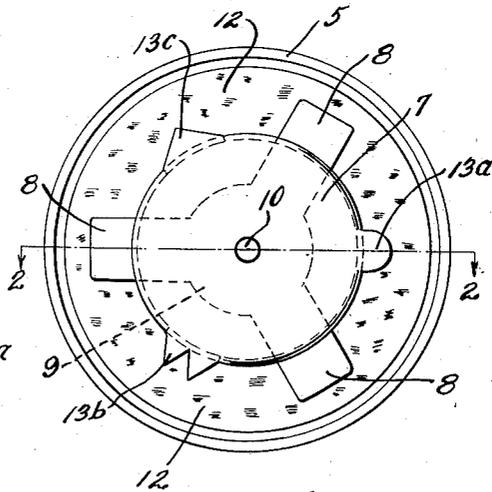


FIG-3

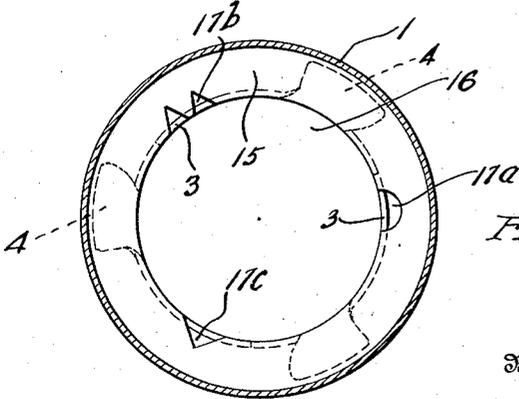


FIG-5

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UNITED STATES PATENT OFFICE

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CLOSURE STRUCTURE

Application filed March 5, 1928. Serial No. 259,140.

This invention relates to closures, such as are used for various parts of automobiles and particularly where it is desirable to apply a closure to a part to be closed in only one angular relation thereto.

The object of the invention is to provide a closure member and a neck member to be closed thereby, together with locking parts adapted for connection and dis-connection by relative rotation of said members, and in which said members are respectively provided with positioning means assuring that they will be assembled or connected in only one definite angular relation.

A further object is to provide a device of this kind including resilient locking parts and cooperating cam parts on the closure and neck members, said members being also provided with other parts which position them angularly relative to each other, thus providing a simple construction for the purpose.

Further objects of the invention are in part obvious and in part will appear in detail hereinafter.

In the drawings, Fig. 1 is a side elevation illustrating the application of the device for use on the radiator of an automobile; Fig. 2 is a sectional elevation on approximately the line 2-2, Fig. 4 and showing both the closure and neck members; Fig. 3 is a bottom plan view of the closure; Fig. 4 is a plan view of the neck; and Fig. 5 is an inverted plan view thereof.

The present invention has more particular application in those special cases where it is desirable or necessary to secure a closure member to the neck member of a device to be closed in only one angular relation. For example, in the splash or dust pans of automobiles the closure member for the starting crank opening sometimes carries ornamental insignia or is of some special shape or design requiring a definite upright position, or, the closure may be for the radiator of an automobile and carry an ornament or a motor meter, as shown at A, Fig. 1, where one definite face must be presented to the view of the driver. The present invention therefore provides a closure which necessarily can

be locked to the neck to be closed in only this one position.

Referring to Fig. 2, 1 represents the neck of the part to be closed. It is of cylindrical form including at its end an inwardly turned annular flange 2, the edges of which are bent back to form cam portions 3, three of which are shown, spaced at regular intervals and separated by gates or openings 4 through which the locking fingers of the cap are introduced. The cap may be of various forms and is shown as including an outer pressed metal shell 5 in which is non-rotatably secured a disk or plate 6 having a depressed cup-shaped central body portion 7 forming a chamber with the outer shell. This inner plate or disk carries resilient locking devices, such as a series of fingers, three of which are shown, extending outwardly at regular intervals from a central disk 9 riveted or otherwise non-rotatably secured to the plate 7, as by the rivet 10. The several arms or fingers 8 extend upwardly and outwardly through openings 11 in the cup-shaped member 7, so that their outer ends will pass through the gates or openings 4 into cooperative locking relation with the cams 3, all according to my prior Patent No. 1,593,847, granted July 27, 1926. As a result, when the cap is applied to the neck and its fingers are passed through openings 4 and the cap is rotated, the fingers travel along the cam edges and more or less compress the gasket 12.

The cap and neck are also provided with positioning means adapted to permit the cap to be assembled on the neck in only the one position referred to, where the motor meter A, Fig. 1, or the ornament or insignia conventionally shown at B, Fig. 2, are in the proper angular position.

In the present application this positioning means includes cooperating parts on the cap and neck members other than the locking devices or parts. As here shown, the cap not only carries the locking fingers referred to, but is also formed or provided with wards or projections, such as by shearing out portions of the metal of the cylindrical side wall of the cup 7 and bending them outwardly to form projections in sets distributed around

the central axis, although a single projection may be sufficient.

As illustrated, there are three sets of projections, marked 13^a, 13^b and 13^c, shown respectively as round, two pronged and single pronged. Whether one or a plurality of sets are used, the neck is provided with a barrier through which gate-ways are provided in number, form and arrangement corresponding to the wards. This barrier 14, in the form shown, is a short piece of tubing secured within the neck and beneath its end flange and itself provided with an inwardly extending flange or wall 15 transverse to the central opening 16 through which the cup 7 passes. The projections 13, however, extend outwardly beyond the edge of this opening, so that the flange 15 is provided with a series of gate-ways 17^a, 17^b and 17^c, corresponding in shape and arrangement to the wards 13^a, 13^b and 13^c. Moreover, the parts are so arranged that flange 15 is spaced from the end flange 2 such a distance that when the wards 13 ride around on its upper face, Fig. 2, the locking end portions of the fingers 8 are above the flange 2 and cannot meet and ride upon the cams 3, but when the wards are passed through their gates, the resilient fingers 8 pass through the gate-ways 4 and reach cooperating relation with the cams 3, along which they ride to locking position. The very act, therefore, of finding and passing through the proper gate-ways in the barrier produces cooperative locking relation between the locking parts of the cap and neck respectively.

One ward 13 and gate-way 17 in some cases are sufficient, although, for uniformity and to approach symmetry several sets may be used.

With this arrangement it will be observed that the locking fingers and their cooperating gate-ways and cams can all be of like form with each other and therefore may be standardized, while considerable differentiation may be employed in forming and shaping the barrier recesses and cap wards.

What I claim is:

1. In combination, a device to be closed provided with a neck member and a closure member therefor, said members being provided with cooperating locking parts adapted for engagement by relative rotation of said members, and other cooperating parts on said members arranged to prevent their assembly in any other than one definite position, said other parts including a positioning ward on one of said members adapted to register with a positioning recess provided on the other of said members, the co-operating positioning means on said neck and closure members being independent of the locking parts of those members.

2. A closure member of the kind described, comprising an outer shell member, an inner

plate member, resilient locking devices carried by said plate member, one of said members being provided with specially shaped positioning means adapted to cooperate with correspondingly shaped positioning means on the part to be closed whereby assembly of the closure member with said part to be closed is permitted in only a single definite position, the specially shaped positioning means of said one member being independent of said resilient locking devices.

3. A closure comprising in combination, an outer shell, an inner member provided with a portion adapted to enter a part to be closed, a locking member carried by said inner member for cooperation with said part to be closed, and correspondingly shaped position selecting means on said inner member and said part permitting the closure to be applied to said part in only a single definite position, the position selecting means on said inner member being independent of the locking member carried by that member.

4. A device of the character described comprising, a closure body having a locking member for releasably connecting the closure body to a part to be closed, and correspondingly shaped cooperating position selecting means on said closure body and said part for preventing assembly of said closure body on said part except in one definite angular position, the position selecting means on said closure body being independent of the locking member of the closure body.

5. A device of the character described comprising, a tubular member to be closed, a closure body having a portion adapted to enter the opening of said tubular member, cooperating locking parts on said tubular member and said closure body for releasably connecting the closure body to the tubular member, a laterally extending flange within said tubular member, and correspondingly shaped cooperating position selecting means on said body portion and said flange for preventing assembly of said closure body on said tubular member except in one definite angular position, the cooperating position selecting means of the closure body portion and of said tubular member being independent of said cooperating locking parts.

In testimony whereof I hereby affix my signature.

JAMES S. REID.