July 25, 1933. M. B. ANDRIE 1,919,189

CLOSURE FOR RADIATORS, GASOLINE TANKS, AND THE LIKE

Filed March 14, 1932

Fig. 1.

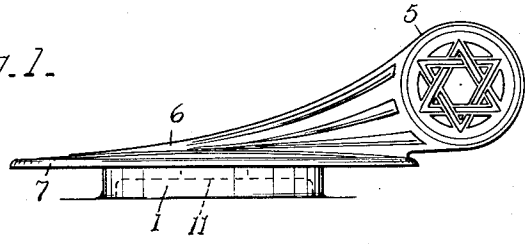
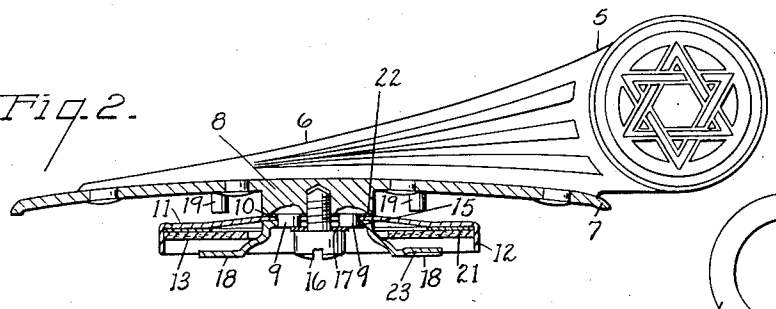


Fig. 2.



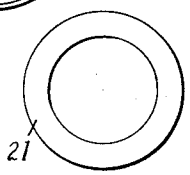


Fig. 7.

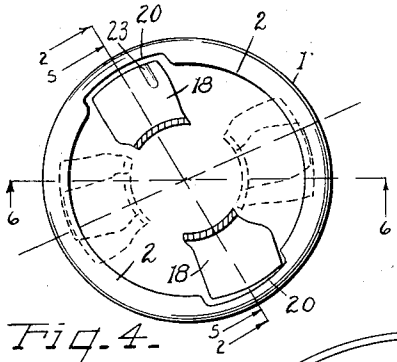


Fig. 4.

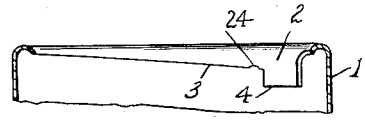


Fig. 5.

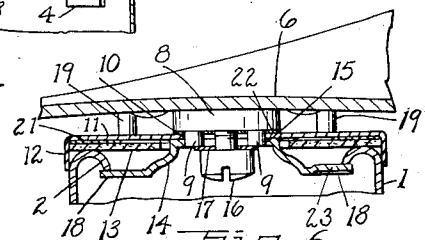


Fig. 6.

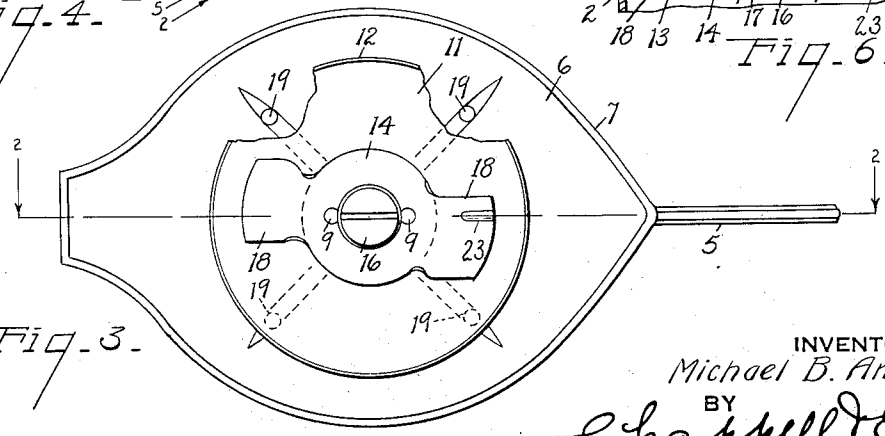


Fig. 3.

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Patented July 25, 1933 1,919,189

UNITED STATES PATENT OFFICE

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CLOSURE FOR RADIATORS, GASOLINE TANKS, AND THE LIKE

Application filed March 14, 1932. Serial No. 598,753.

My present improvements relate to the type of closure disclosed in my application for Letters Patent, Serial No. 402,889, filed October 28, 1929, and is an adaptation and in some respects an improvement thereon.

The main object of this invention is to provide a closure of this type which is effective as a sealing closure, may be quickly applied and released, and at the same time is very effectively held under spring tension.

A further feature of the present invention is the use of a thin shim disposed between the gasket and the closure disk so that friction is minimized to permit the gasket to rotate without distortion.

Objects pertaining to details and economies of my invention will definitely appear from the description to follow. The invention is defined in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawing, in which:

Fig. 1 is a side elevation of a closure embodying my invention.

Fig. 2 is an enlarged vertical section through a radiator structure taken on a line corresponding to line 2—2 of Fig. 4.

Fig. 3 is an enlarged bottom view of the closure.

Fig. 4 is a fragmentary horizontal section illustrating the operation of the closure.

Fig. 5 is a fragmentary vertical section of the radiator neck taken on line 5—5 of Fig. 4.

Fig. 6 is a fragmentary vertical section taken on line 6—6 of Fig. 4.

Fig. 7 is a plan view of the shim.

In the embodiment illustrated, numeral 1 represents the filler neck of an automobile radiator having an inturned flange 2 at its upper end providing a gasket seat. On the inner edge of the flange are provided opposed segmental cammed keepers 3 having diametrically opposed stops 4 at their ends.

The closure or cap 5 comprises an ornamental die-cast body member 6 having a depending peripheral flange 7 for coacting with the shell of the radiator (not shown). The body member 6 is provided with an integral centrally positioned depending stud or boss 8 having integral lugs 9 which are adapted to engage corresponding openings 10 in the resilient sheet metal closure disk 11 which constitutes the closure proper. The closure disk is preferably crowned somewhat and is provided at its outer edge with a downturned flange 12 embracing the neck 1 and centering the closure thereon. A gasket 13 is arranged within the flange 12 to coact with the seat formed on the top of the neck by the inturned flange 2.

In addition to the closure disk 11 the stud 8 also carries a latch plate 14 which is provided with an opening 15 engaging the lugs 9 for preventing the rotation thereof relative to the disk and body member. The latch plate 10 and the closure disk 11 are secured to the stud 8 by the screw 16 which clamps the spring washer 17 into engagement with the latch plate 14.

The latch plate 14 is provided with opposed resilient locking fingers 18 for coaction with the cammed edges of the radiator neck. The comparative resiliency between the closure disk 11 and the locking fingers 18 is preferably such that the disk is weaker or more resilient than the locking fingers 18 so that when the two are subjected to the same stress the disk will be the first to yield unless prevented or stopped.

For allowing the disk to yield only a certain amount whereby to bring the resilience of the locking fingers into action, the closure member 6 is provided with a plurality of depending stop lugs 19 which are disposed above and near the rim of the closure disk 11.

The operation of the device is as follows: The closure is placed in position with the depending flange 12 of the closure disk engaging the periphery of the neck 1 by registering the locking fingers 18 with the recesses 20 provided for the purpose in the flange 2 of the neck 1. The closure is then turned until the closure fingers 18 engage the stops 4. In the turning of the closure the resilient closure disk 11 yields until it engages the stop lugs 19, whereupon the continued rotational movement of the closure causes the resilient fingers 18 to yield until the stops 4 are reached. In other words, during the initial

movement of the closure the disk 11 yields and during the final movement the locking fingers 18 yield, thereby providing a double spring locking action.

A thin copper shim 21 is disposed between the gasket 13 and the closure disk 11 adjacent to the depending flange and in vertical alinement with the gasket on the filler neck. The shim 21 reduces friction between the gasket and the closure disk in such manner that the closure disk and the gasket are relatively rotatable and are not subject to the binding action therebetween, which usually results in the distortion or mutilation of the gasket.

A small sealing gasket 22 is disposed between the hub of the latch plate 14 and the stud or boss 8, the gasket being cut out to accommodate the integral depending lugs 9 and the shank of screw 16.

One of the resilient fingers 18 of the latch plate is provided with a radial indentation providing a projection 23 for coaction with the recess 24 in the lower edge of the flange 2 of the filler neck adjacent to the stop 4. The projection coacts with the notch to hold the cap in its proper position.

My improved closure is very economical in its parts, and the parts are easily assembled. At the same time, the structure is attractive in appearance and strong and durable.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiments of my invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

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

1. The combination of a neck having an inturned flange providing a gasket seat, said flange having oppositely disposed cammed keepers on the edge thereof having stops at their ends, a closure comprising a body member having a central depending stud provided with a lug, a resilient sheet metal closure disk mounted on said stud and having an opening to receive said lug, said closure disk having a downturned flange at its outer edge adapted to receive and to closely embrace said neck for facilitating the positioning of the closure thereon, a gasket arranged within said closure disk flange, a latch plate arranged on said stud in supporting engagement with said closure disk and having an opening to receive said lug, said latch plate having resilient locking fingers coacting with said keepers, said fingers being substantially less yielding than said closure disk, and means securing said disk and latch member on said stud, said body member having depending lugs disposed above and adjacent the rim of said disk for stopping the upward yielding thereof prior to the limit of rotational movement of the closure whereby continued rotational movement of the closure results in the yielding of the locking fingers.

2. The combination of a neck having oppositely disposed cammed keepers on the edge thereof having stops at their ends, a closure comprising a body member having a central depending stud provided with a lug, a resilient sheet metal closure disk mounted on said stud and having an opening to receive said lug, a latch plate arranged on said stud in supporting engagement with said closure disk and having an opening to receive said lug, said latch plate having resilient locking fingers coacting with said keepers, said fingers being substantially less yielding than said closure disk, and means securing said disk and latch member on said stud, said body member having depending lugs disposed above and adjacent the rim of said disk for stopping the upward yielding thereof prior to the limit of rotational movement of the closure whereby continued rotational movement of the closure results in the yielding of the locking fingers.

3. The combination of a neck having an inturned flange providing a gasket seat, said flange having oppositely disposed cammed keepers, a closure comprising a body member having a central depending stud, a resilient sheet metal closure disk mounted on said stud, the closure disk having a downturned flange at its outer edge adapted to receive and to closely embrace said neck for facilitating the positioning of the closure thereon, a gasket arranged within said closure disk flange, and a latch plate arranged on said stud, said latch plate having resilient locking fingers coacting with said keepers, said fingers being substantially less yielding than said closure disk, said body member having depending lugs disposed above and adjacent the rim of said disk for stopping the upward yielding thereof prior to the limit of rotational movement of the closure whereby continued rotational movement of the closure results in the yielding of the locking fingers.

4. The combination of a neck having oppositely disposed cammed keepers, a closure comprising a body member having a central depending stud, a resilient sheet metal closure disk mounted on said stud, and a latch plate arranged on said stud, said latch plate having resilient locking fingers coacting with said keepers, said fingers being substantially less yielding than said closure disk, said body member having depending lugs disposed above and adjacent the rim of said disk for stopping the upward yielding thereof prior to the limit of rotational movement of the closure whereby continued rotational movement of the closure results in the yielding of the locking fingers.

5. The combination of a neck provided

with a gasket seat and with cammed keepers, a closure comprising a body member having a central stud, a resilient closure disk mounted on said stud, said closure disk having a downturned flange at its outer edge adapted to receive said neck and coact with the neck to position the closure, a gasket arranged between said closure disk and said gasket seat, and a latch member arranged on said stud in supporting engagement with said closure disk and having spring keeper engaging fingers of less resilience than said closure disk, said body member having stop lugs for limiting the yielding movement of said resilient closure disk and with which said closure disk is adapted to engage prior to the limit of rotational movement of the closure whereby continued rotational movement of the closure results in the yielding of said locking fingers.

6. The combination of a neck provided with cammed keepers, a closure comprising a body member having a central stud, and a latch member arranged on said stud in supporting engagement with said closure disk and having spring keeper engaging fingers of less resilience than said closure disk, said body member having stop lugs for limiting the yielding movement of said resilient closure disk and with which said closure disk is adapted to engage prior to the limit of rotational movement of the closure whereby continued rotational movement of the closure results in the yielding of said locking fingers.

7. The combination with a neck having a gasket seat and provided with cammed keepers having stops at their ends, a closure comprising a body member having a central depending stud, a resilient closure disk mounted on said stud, a gasket arranged between said closure disk and said seat on said neck, resilient keeper engaging fingers mounted on said stud to coact with said keepers, said fingers being of substantially less resilience than said closure disk, and stop means on said closure for limiting the upward yielding of said closure disk whereby, upon applying the closure to the neck the closure disk will yield until it engages said stop means and thereafter the keeper engaging lugs will yield to provide a positive locking engagement of the lugs with the keepers.

8. The combination with a neck provided with cammed keepers, a closure comprising a body member having a central depending stud, a resilient closure disk mounted on said stud, resilient keeper engaging fingers mounted on said stud to coact with said keepers, said fingers being of substantially less resilience than said closure disk, and stop means on said closure for limiting the upward yielding of said closure disk whereby, upon applying the closure to the neck, the closure disk will yield until it engages said stop means and thereafter the keeper engaging lugs will yield to provide a positive locking engagement of the lugs with the keepers.

9. The combination with a neck having a gasket seat and provided with cammed keepers having stops at their ends, of a closure comprising a body member, a resilient closure disk supported at its center on said body member, a gasket arranged between said closure and said seat on said neck, resilient keeper engaging fingers mounted on said body member below said closure member to coact with said keepers, said fingers being of substantially less resilience than said closure disk, and stop means on said closure for limiting the upward yielding of said closure disk whereby, upon applying the closure to said neck, the closure disk will yield until it engages said stop means and thereafter the keeper engaging lugs will yield to provide a positive locking engagement of the lugs with the keepers.

10. The combination with a neck provided with cammed keepers having stops at their ends, of a closure comprising a body member, a resilient closure disk supported at its center on said body member, resilient keeper engaging fingers mounted on said body member below said closure member to coact with said keepers, said fingers being of substantially less resilience than said closure disk, and stop means on said closure for limiting the upward yielding of said closure disk whereby, upon applying the closure to the neck, the closure disk will yield until it engages said stop means and thereafter the keeper engaging lugs will yield to provide a positive locking engagement of the lugs with the keepers.

MICHAEL B. ANDRIE.