

May 16, 1933.

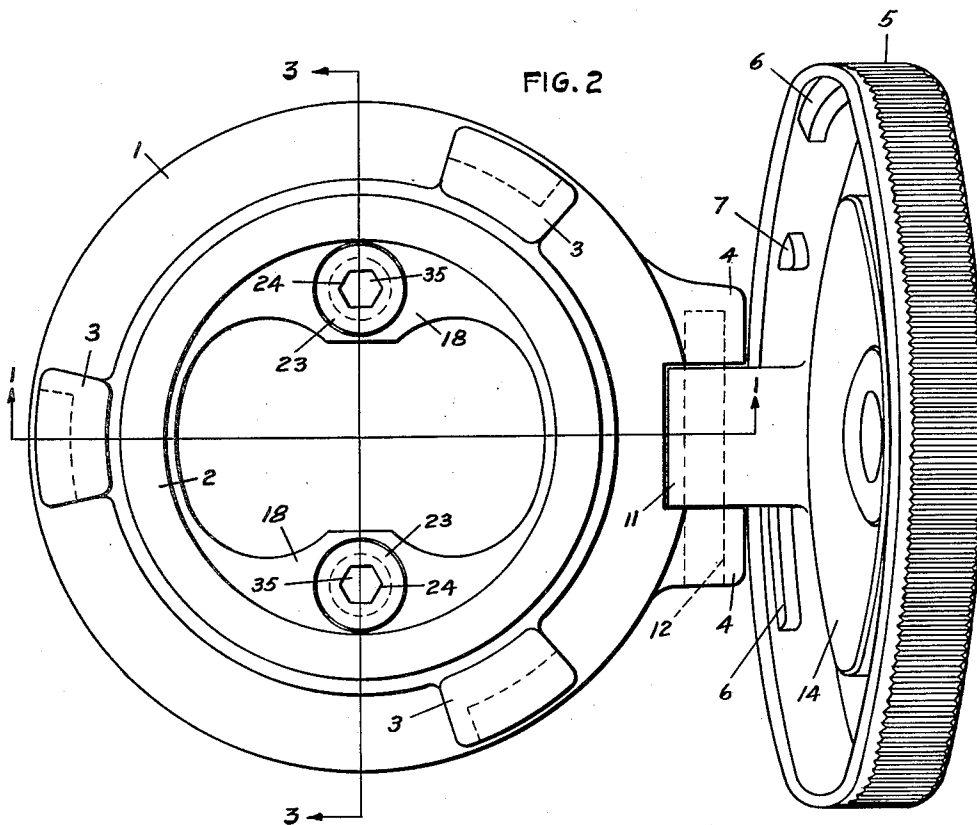
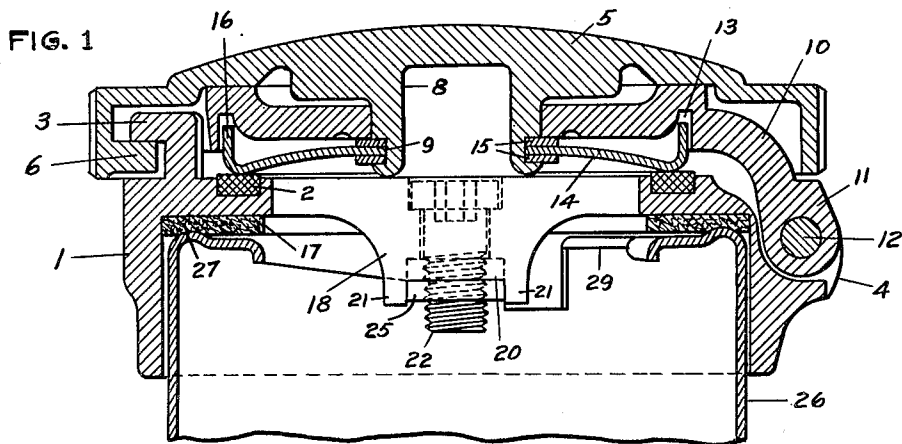
K. E. STANT

1,909,554

RADIATOR CAP

Filed March 24, 1930

3 Sheets-Sheet 1



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RADIATOR CAP

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FIG. 3

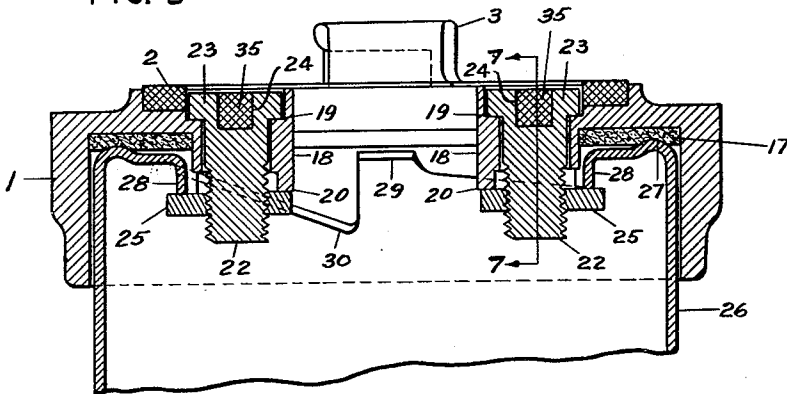
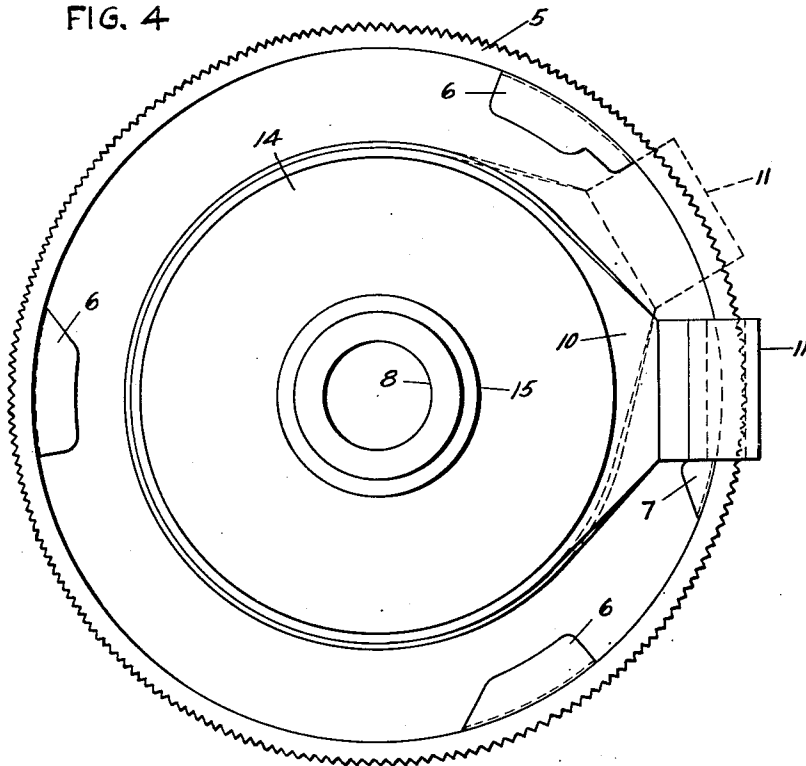


FIG. 4



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3 Sheets-Sheet 3

FIG. 5

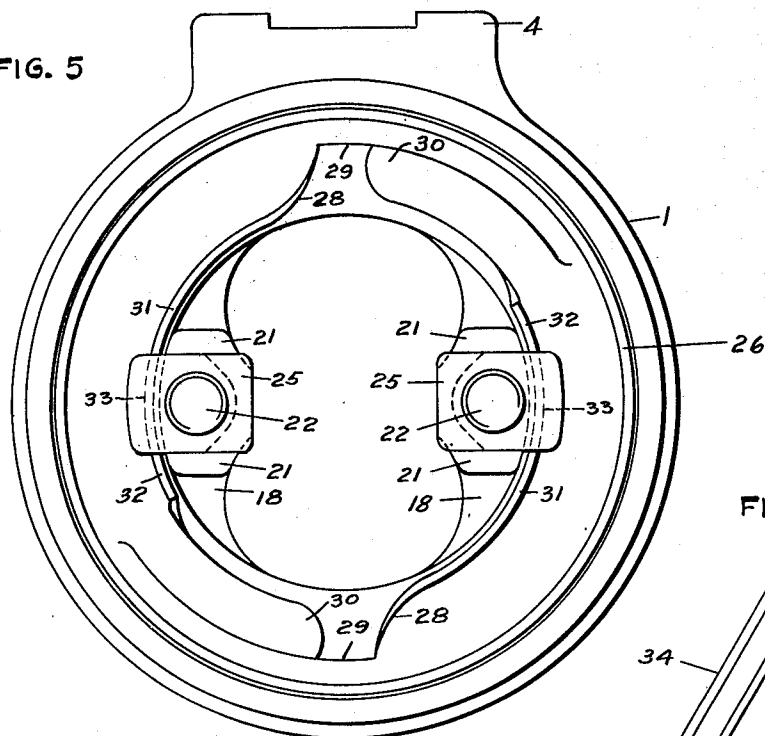


FIG. 9

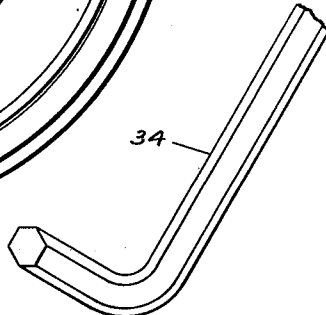


FIG. 6

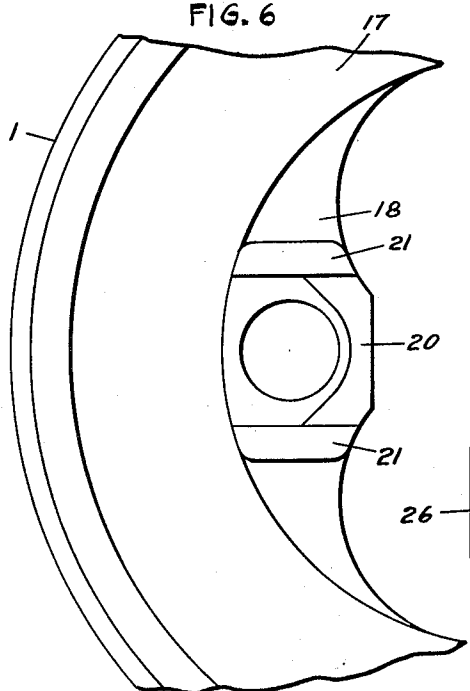


FIG. 7

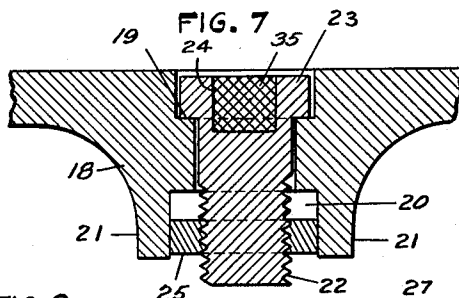
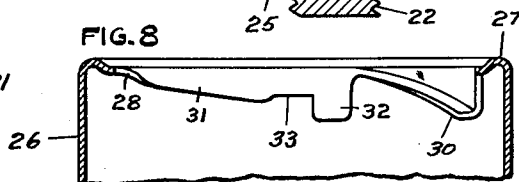


FIG. 8



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RADIATOR CAP

Application filed March 24, 1930. Serial No. 438,351.

This invention relates to improvements in radiator caps, and has for its object to provide a radiator cap composed essentially of three parts, a ring member adapted to engage the spout, a hinge plate and a cap member pivotally attached to the hinge plate.

It is particularly the object of this invention to provide, in connection with a cap of this kind, means for attaching the spout ring to the upper edges of the spout so that it cannot be easily removed therefrom. This is accomplished by means of bosses formed on the inside of the spout ring, through which screw members extend to engage plates for the purpose of fastening the spout ring to the upper edges of the spout. For the purpose of engaging with the plates there is formed on the upper edges of the spout a turned-down cam surface with locking seats therein to be engaged by the plates in the first instance for properly seating and pressing the spout ring on the spout, and finally, for locking the ring thereon against turning.

It is also an object of this invention, in connection with the screw means used for fastening the plates to the spout, to provide means to prevent the removal of the screws. Any wanton or unauthorized operation of the screws for the purpose of releasing the spout ring from the spout can thus be prevented.

For the purpose of illustration there is shown in the accompanying drawings a preferred embodiment of this invention.

Referring to the drawings:

Figure 1 is a section on the line 1—1 of Figure 2 with the cap down.

Figure 2 is a top plan view of the spout ring with the cap in open position.

Figure 3 is a section on the line 3—3 of Figure 2.

Figure 4 is an inside view of the pivotally and rotatably mounted cap member.

Figure 5 is a bottom plan view of the spout ring with the cap removed.

Figure 6 is a fragmentary view of the spout ring showing one of the bosses used

in connection with fastening the spout ring to the spout.

Figure 7 is a section on the line 7—7 of Figure 3.

Figure 8 is a vertical section through the upper end of the filler spout.

Figure 9 is a view of the tool used for rotating the screws 22.

The radiator cap is composed of three parts, a spout ring, a hinge plate and a cap pivotally and rotatably mounted on the hinge plate. The spout ring is indicated by the numeral 1 and is cylindrical in shape, having an inwardly projecting flange which serves partly as a closure for the end of the spout. This flange is provided with an annular seat in which there is a gasket 2.

Projecting upwardly and extending outwardly from the spout ring are three lugs 3. There is also extending from one side of the spout ring a pair of ears 4. The cap 5 is somewhat dish-shaped and has a cylindrical outer wall which has extending therefrom a plurality of lugs 6. These lugs are to engage the lugs 3 for the purpose of holding the cap in engagement with the spout ring. There is also provided on the inside of the cap a stop 7.

Extending from the interior center part of the cap is a thimble member 8 which has on the outer periphery thereof a groove 9 for the purpose of receiving and supporting a diaphragm member, hereafter described. Supporting the cap member is a hinge plate 10, which is circular in shape, having a hole in the center thereof through which the thimble member 8 passes and by which the cap 5 is supported for rotation. Extending from one side of the hinge plate is an ear 11 which fits between the ears 4. Through these ears there is a pivot pin 12 for the purpose of pivotally attaching the hinge plate to the spout ring so that the cap may be opened and closed on the spout ring. On the inside of the hinge plate, as shown in Figure 1, there is an annular groove 13.

In the groove 9 there is supported a diaphragm 14. Between the faces of the diaphragm and the walls of the groove 9 are

washers 15 for the purpose of holding the diaphragm in firm relationship with the thimble 8. The diaphragm is circular in shape and has its outer periphery upturned at 16 and engaging within the annular groove 13. This diaphragm is resilient, and when the cap is in closed position on top of the spout ring engages the gasket 2 to form a close sealing fit between the cap and the filler spout.

Within the filler spout there is a second annular gasket 17 which serves the purpose of forming a close sealing connection between the spout ring and the upper edges of the spout. Projecting inwardly from the spout ring are two bosses 18, each of which has a vertically extending hole therein bored out at the top to form a seat 19. The lower part of each hole has a stop 20 on one wall, and two other opposite walls form the side walls, for a purpose hereinafter to be described. Through the bosses there extend screws 22, the heads 23 of which fit within the seats in the holes. In the heads there can be a hexagonal socket 24 or a slot to receive a tool for the purpose of rotating the screw.

Resting between the side walls 21 and engaging the stop 20 is a plate 25, which has a screw threaded hole therethrough to receive the screw 22. This plate projects beyond the screw on the side opposite the stop 20 for the purpose of locking the spout ring to the top of the spout. In the present instance there are shown two of these bosses and a screw for each boss. The number may vary, depending upon the size of the spout ring.

The filler spout is indicated by the numeral 26 and is circular in shape, and has the top turned inward and downward. The turned-in and down part of the spout is first round adjacent the upper edges of the spout to form a smooth oval surface 27 to be engaged by the gasket 17. Immediately adjacent the oval surface 27 the inturned part is slightly bench-shaped, after which it is turned down in a vertical position to form cams. The turned-down part is indicated by the numeral 28. On opposite edges of the spout the turned-in and turned-down parts are cut away to form entrance notches 29.

On one side of the notches the turned-down parts are formed into cam surfaces 31 which terminate in stops 32. Adjacent each stop is a flat portion 33 forming seats on which the plate members 25 rest when the spout ring is in proper position on top of the spout. For the purpose of applying the spout ring to the spout the screws are turned sufficiently to partly release or loosen the plates 25. The spout ring is thus placed over the top of the spout with the plates 25 resting in the entrance notches 29, after which

the spout ring is turned to the right, thus engaging the plates 25 beneath the cam surfaces 31. This engagement of the plates 25 with the cam surfaces 31 causes the spout ring to closely engage the upper surfaces of the spout so that the gasket 17 forms therewith a close gas-tight closure.

When the spout ring is turned sufficiently that the plates 25 are seated on the seats 33 the spout ring and its cap are in proper closing position. At this time the screws are rotated to force the plates 25 upward onto the seats so that all of the parts are firmly held in the desired position on top of the spout. In this position the plates 25 are locked onto the seats 33 creating a friction between the spout ring and the gasket 17 and the spout 26 so that the spout ring cannot turn and cannot be turned until the screws are rotated to release the plates, and for the purpose of preventing this rotation and release of the plates each of the sockets 24 has placed therein a plug of soft metal so that this socket is filled up. The plug is generally a ball of lead which can be easily forced into the socket to fill it. For the purpose of rotating the screw there is provided a small tool having a hexagonal end to engage the sockets. This tool is shown in Figure 9 and is indicated by the numeral 34, whereas the lead within the socket is indicated by the numeral 35.

With the sockets thus plugged it would be impossible for the spout ring to be removed from the spout without a great deal of difficulty. In fact, the plugs would have to be dug out, which requires some time and some care, and after the plugs are dug out the necessary tool would have to be at hand for rotating the screws to release the plates. By this means the spout ring is securely fastened to the upper end of the spout and cannot be readily removed therefrom, but in the event it becomes necessary to remove the spout ring from the spout the plugs may be removed from the sockets, after which the usual tool may be used for rotating the screws to release the plates.

From the foregoing it will be apparent that this invention embraces a distinct improvement in the art of securely attaching a closure cap to the bayonet type of filler spouts of radiators and fuel tanks now in very extensive use, this type of spout being commonly adapted to receive the detachable type of closures or caps. It will also be apparent that while the compact clamping mechanism is practically concealed inside the spout opening, there still remains a substantial opening through the central part of the closure ring for the unrestricted flow of liquid into the filler spout.

The cap herein illustrated and claimed obviously may be used as a closure for gasoline tanks or in fact many other kinds of

receptacles and the term "radiator cap" is herein used merely for the purposes of describing one embodiment of my invention for illustrative purposes only.

5 I desire to comprehend within my invention such modifications as may be clearly embraced within my claims and the scope of my invention.

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

1. In a radiator cap, a filler spout having inturned and downwardly turned upper edges with notches therein, the turned-down edges being formed on one side of each notch
15 into a cam surface terminating in a seat, and a cap for said spout, said cap having adjustable clamp members thereon adapted to engage the guideways and the cams and to be locked on said seats.

2. In a radiator cap, a filler spout having a plurality of downwardly inclined guide members thereon and adjacent one end of each guide member a downwardly inclined
25 cam member terminating in a seat, and a cap for said spout, said cap having adjustable clamp members thereon adapted to engage the guide members and the cam members and be locked on said seats.

3. In a radiator cap, a filler spout having a plurality of downwardly inclined and inwardly directed guide members thereon and adjacent one end of each guide member a downwardly inclined cam member terminating in a flat seat, a cap member adapted to
35 fit on said spout, and adjustable means on said cap member adapted to first engage the guide members and the cam member to position and tighten the cap on the spout and then engage the seats, whereby the cap may be locked on the spout.

4. In a radiator cap, a filler spout having a plurality of downwardly inclined guide members thereon and adjacent one end of
45 each guide member a cam member terminating in a seat, a cap member adapted to fit on said spout, adjustable means on said cap member to engage said guide members and said cam members to position and tighten the cap on the spout and then engage the seat, whereby the cap is locked on the spout.

5. In combination in a closure, a spout having thereon, clamping and locking surfaces and positioning means, a cap adapted
55 to fit on said spout and means on said cap to engage said surfaces and positioning means, whereby the cap may be clamped, positioned and locked on said spout.

6. In combination in a closure, a spout having thereon, clamping and locking surfaces and positioning means, a cap adapted
60 to fit on said spout, and adjustable means on said cap to engage said surfaces and positioning means, whereby the cap may be

clamped, positioned and locked on said spout.

7. In combination in a closure, a spout having thereon, clamping and locking surfaces and positioning means, a cap adapted
70 to fit on said spout and clamping plates on said cap to engage said surfaces and positioning means, whereby the cap may be clamped, positioned and locked on said spout.

8. In a radiator cap, in combination with a filler spout having cam surfaces ending in flat seats, a spout ring adapted to fit on
80 said spout, clamp plates on said ring adapted to engage said cam surfaces and said seats to clamp and lock the ring on the spout, and means to force said plates onto said seats.

9. In a closure cap, in combination with a filler spout having cam surfaces terminating in depressed seats, a spout ring adapted to fit on said spout, clamp plates on said ring
85 adapted to engage said cam surfaces and said seats to clamp and lock the ring on said spout, and screw means to force said plates onto said seats.

10. In a closure apparatus, in combination with a filler spout having locking members thereon, a spout ring adapted to fit on said
95 spout, said spout ring having bosses thereon, a locking member cooperating with each boss to permit substantially vertical movement of said member and adapted to engage one of said locking members on said filler spout, and a screw on each boss to operate its locking member.

11. In a closure apparatus, in combination with a filler spout having locking members thereon, a spout ring adapted to fit on
105 said spout, said spout ring having bosses thereon, each boss having a hole therein and a pair of side walls, a clamping plate between the side walls on each boss adapted to engage one of said locking members, and a screw in each hole to force each of said plates against a locking member.

12. In a closure cap, in combination with a filler spout, a closure for said spout, a pair of bosses on said closure, each boss having
115 a hole with an enlarged part forming a seat therein, a headed screw in each hole with its head in said seat, and a plate on each screw adapted to engage the spout to hold the closure to the spout by the operation of its screw, and means on each boss to prevent any rotation of said plate.

13. In a closure cap, in combination with a filler spout having a pair of inwardly projecting locking members thereon, a closure
120 for said spout having a pair of inwardly projecting bosses thereon, each boss having a hole with a seat in one end, a headed screw in each hole with its head in said seat, a plate on each screw to engage one of said locking members on rotation of the screw to lock the closure to the spout, and a pair

of side walls on each boss, one on each side of a plate to prevent the plate turning with the screw.

14. In a closure apparatus, in combination with a filler spout having a plurality of inwardly projecting locking members thereon, a spout ring adapted to fit over said spout, a plurality of inwardly projecting bosses on said ring, each boss having a hole with a seat in one end, a headed screw in each hole with its head in said seat, a plate on each screw to engage one of said locking members on the rotation of the screw to lock the ring to the spout, and a cap mounted on said ring.

15. In combination, a ring, a loosely mounted locking stud therein having a socket-engaging portion, a head on said stud countersunk in said ring, a thread on said stud, a clamping plate threaded thereon, and means on said ring preventing the rotation of said plate on said stud.

16. In combination, a ring, a loosely mounted locking stud therein having a socket-engaging portion, a head on said stud counter sunk in said ring, a thread on said stud, a clamping plate threaded thereon, means on said ring preventing the rotation of said plate, and a shoulder on said ring adapted to engage said plate to tip it.

17. In combination, a filler spout having inwardly turned flanges, cam surfaces thereon, shoulders thereon for stops, and recesses adjacent said shoulders and cam surfaces for receiving locking plates and adapted to register said plates with respect to said spout.

18. In combination, a cap, a ring supporting the cap, means to detachably lock the ring and cap to one another, a filler spout supporting said ring, a cam locking means between said spout and said ring, and a clamping lock associated therewith for locking the ring and spout one to another.

19. In combination, a cap, a ring supporting the cap, means to detachably lock the ring and cap to one another, a filler spout supporting said ring, a cam locking means between said spout and said ring, a clamping lock associated therewith for locking the ring and spout one to another permanently, and means to render said clamping lock substantially inoperative to unlocking.

20. In combination, a cap, a ring pivotally supporting the cap and permitting of relative movement therebetween for the engagement of a detachable locking means therebetween, adjustable locking means carried by said ring, a filler spout having means to engage said locking means, said locking means comprising spaced locking screws having a head on one end, locking plates carried on said screws, shoulders on said ring for preventing the rotation of said

plates, and a locking edge on said filler spout engaging said plates.

21. In combination, a cap, a ring pivotally supporting the cap and permitting of relative movement therebetween for locking a detachable locking means therebetween, adjustable locking means carried in said ring, a filler spout having means to engage said locking means, said locking means comprising spaced locking bolts having a head on one end and a threaded end at the other, locking plates carried thereon on the threaded ends, shoulders on said ring for preventing the rotation of said plates, on said locking bolts and a locking edge on said filler spout engaging said plates, said spout having seats for receiving said plates in locking engagement to prevent rotation of the ring on the spout after locking.

22. In combination, a cap, a ring pivotally supporting the cap and permitting of relative movement therebetween for locking a locking means therebetween, countersunk adjustable locking means carried in said ring, a filler spout having means to engage said locking means, said locking means comprising spaced locking screws, locking plates carried thereon on the threaded ends, shoulders on said ring for preventing the rotation of said plates on said bolts, a locking edge on said filler spout engaging said plates, said spout having seats for receiving said plates in locking engagement to prevent rotation of the ring on the spout after locking, and means of rendering said locking means inoperative after being locked.

23. In combination, in a closure, a spout having thereon a clamp member, a ring rotatably mounted on said spout, and a locking means on said ring including a separate plate movable relative to said ring to engage said spout clamp member to clamp said spout and ring together securely.

24. In combination, a cap, a ring supporting the cap, means to detachably lock the ring and cap together, a filler spout supporting said ring, interlocking means between said spout and said ring, comprising a projecting cam member and a separate member movable with respect to said ring adapted to engage said projecting cam member, one of said elements of the interlocking means being on the spout and the other on the ring, whereby the ring and the spout may be clamped together.

25. In combination, a spout having thereon a notched flange, a ring mounted rotatably on said spout, clamping means on said ring including a separate plate movable relative to said ring to engage said spout flange to clamp said spout and ring together, said clamping means being located adjacent said flange.

26. A closure structure comprising, in combination, a spout having thereon a

notched flange, a ring mounted rotatably on said spout, a cover for said ring, clamping means on said ring including a separate plate movable relative to said ring to engage said spout flange to clamp said spout and ring together, said clamping means being located adjacent said flange.

27. In combination, a filler spout, a flange having an entrance notch therein on said spout, a collar rotatably mounted on said spout, clamping means associated with said collar including a separate clamping plate movable with respect to said collar, a portion of said clamping plate adapted to enter said entrance notch and to engage said flange upon rotation of said collar whereby the collar and the filler spout may be clamped together, said clamping means being located adjacent said flange.

28. A closure structure comprising, in combination, a filler spout, a flange having an entrance notch therein on said spout, a collar rotatably mounted on said spout, a cover for said collar, clamping means associated with said collar comprising a screw means cooperating with a separate clamping member movable with respect to said collar, said clamping member adapted to register with said entrance notch and to engage said flange upon rotation of said collar, whereby the collar and the filler spout may be clamped together, said screw means being located adjacent said flange.

29. In combination, a spout having thereon a notched flange, a ring mounted rotatably on said spout, said spout and ring having an unobstructed central passage, clamping means on said ring including a separate member movable relative to said ring to engage said spout flange to clamp said spout and ring together, said clamping means being located adjacent said flange.

In testimony whereof, I affix my signature.

KYLE E. STANT.