March 26, 1935. B. H. BOWLUS ET AL 1,995,468

RADIATOR CAP

Filed Sept. 6, 1932

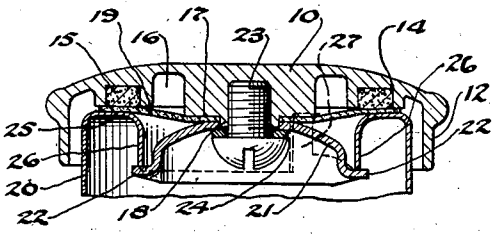


Fig. 1

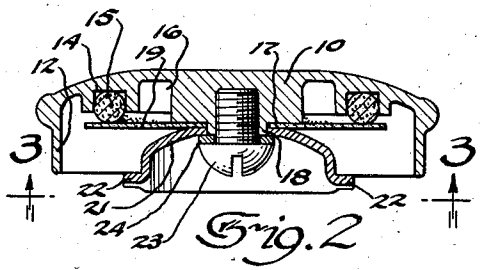


Fig. 2

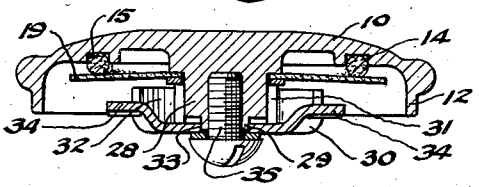


Fig. 4

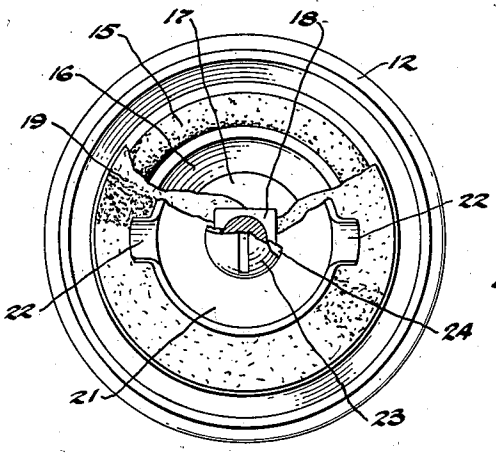


Fig. 3

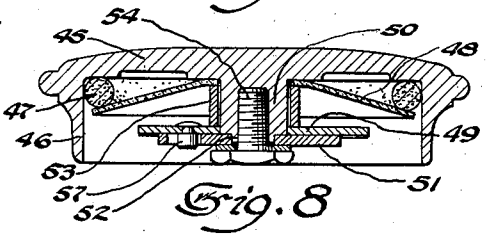


Fig. 8

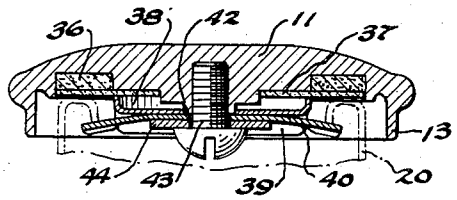


Fig. 5

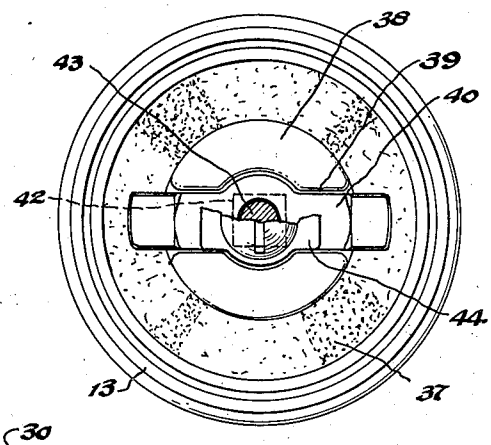


Fig. 6

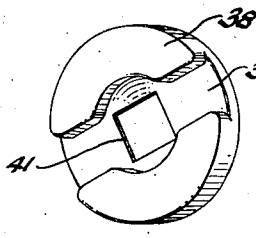


Fig. 7

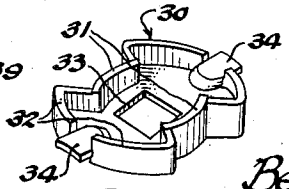


Fig. 9

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RADIATOR CAP

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Application September 6, 1932, Serial No. 631,824

5 Claims. (Cl. 220—40)

Our invention relates to radiator caps for closing the upper ends of the necks, pipes or passages through which water is supplied to the radiators of automobiles; and the object thereof is to provide a radiator cap having an improved resilient gasket construction whereby tightness is more effectively secured between the cap and the supply opening and a better sealing results than has heretofore been usual in radiator cap constructions, and one wherein the resilient gasket is protected so that the cooling liquid within the radiator is prevented from coming into contact therewith.

The drawing herewith illustrates the preferred form of our invention, and the particular features wherein the same consists are pointed out in the concluding claims. Our invention, however, may be embodied in other forms and the same includes such obvious variations and modifications of the particular form illustrated as come within the scope of the concluding claims.

Referring to the drawing:

Figure 1 is a view showing our improved radiator cap in section, and in place upon the upper end of a neck or short conduit leading into a radiator, not shown.

Figure 2 is a similar view showing the cap separate from the filling conduit.

Figure 3 is a view looking into the inside of the cap illustrated in Figures 1 and 2.

Figure 4 is a sectional view showing a modified form of our improved radiator cap.

Figure 5 is a sectional view like Figure 1, but showing our improved radiator cap modified as to some of its details.

Figure 6 is a view showing the inside of the form of our invention illustrated in Figure 5.

Figure 7 is a view showing an element of this form of our invention in perspective.

Figure 8 is a sectional view showing a further form of our invention in which the yieldable ring member thereof is differently arranged than in the forms thereof illustrated in Figures 1 to 7.

Figure 9 is a view similar to Figure 7 but showing an element of the form illustrated in Figure 4.

Our invention has as its principal part a main body member 10 in Figures 1 to 4, and 11 in Figures 5 and 6, the same being a shallow cup-like metallic member made generally by well known die casting methods; the periphery thereof having a depending annular flange 12 and 13 which gives to it its cup-shape form.

Continuing now with the description of Figures 1 to 3, the head of the part 10 is provided with an annular recess or groove 14 in its inner face and within which there lies a gasket shown as in the form of an annular resilient and yieldable ring member 15, which may be made of rubber, the ring being either solid as shown, or hollow if greater yieldability is required. The head is shown as having also a second annular recess 16, but this is for the purpose of saving metal and securing lightness in the body casting.

The body casting 10 has a central boss with a flat lower face 17, and a depending square part 18; and the numeral 19 designates a disc made, ordinarily, of indurated fiber and which has a square central hole fitting about the square part 18, so that it cannot turn relative to the cap as the cap is put into place and rotated to lock it onto the upper end of the filling conduit or neck 20 which the cap is designed to close. The periphery of this disc contacts with the underside of the ring 15 and seals the same from the liquid within the radiator or, as otherwise expressed, prevents the liquid from coming into contact with the ring. When the cap is off the neck the periphery of the disc rests lightly against the ring, but when the cap is locked in place on the radiator filling inlet the ring is flattened and compressed as indicated in Figure 1.

Located below the fiber or equivalent material disc 19 is a circular cup-shaped locking member 21 whereby the cap is held in place upon the upper end of the filling neck 20. This member is ordinarily made from sheet metal pressed and shaped to give it substantially the form shown, and has oppositely disposed holding lugs 22 projecting from opposite sides of its lower end. The locking member 21 also has a square hole fitting about the square part 18 to restrain it from turning; and the said member and the fiber disc 19 are fastened to the body part 10 in any suitable manner such, for example, as by a screw 23, a lock washer 24 being ordinarily placed between the head of the screw and the underside of the locking member to prevent loosening of the screw.

The filling neck 20 is of conventional form having a flat upper face 25 which presses against the underside of the fiber disc 19 when the cap is in place upon the neck, as shown in Figure 1. This neck as is usual has oppositely disposed internal inclined lugs 26, and vertical slots 27 also oppositely located although only one is shown; so that in putting the cap in place the lugs 22 pass down through the slots, and the cap is then rotated to secure a wedging action between the lugs 22 and the lower edges of the lugs 26. Although the conduit or neck 20 is shown as a thin tube having its upper end turned inward and over to form the

face 25 and lugs 26, our invention is in no way concerned with the neck so long as it has elements and features which provide the flat part, the inclined lugs and the slots 27 through which the lugs 22 may pass preparatory to rotating the cap to cause said lugs to engage inclined lugs 26 located within the neck.

The diameter of the circular locking member 21 is near to the distance between the internal inclined lugs 26, so that the locking member serves as a guide to position the cap as a whole upon the upper end of the filling conduit 20 with a fair degree of definiteness, even though the two parts do not fit closely together. Initially and before the cap is put in place the disc 19 is substantially flat, and the yieldable resilient ring 15 or gasket is uncompressed, as indicated in Figure 2; but the putting of the cap in place upon the neck 20, and the turning of it to lock it in place as hereinbefore explained, deflects the periphery of the disc and flattens the rubber ring 15 substantially as indicated in Figure 1. This action, however, is not accompanied by a rubbing action of a metal part like the surface 25 against the rubber ring because the disc as well as the locking member rotate with the body part 10 during the locking of the cap in place; and such water or other cooling medium as may splash up between the locking member 21 and the lugs 26 contacts with the fiber disc 19, and not with the rubber ring 15, whereby the latter is protected from injury by the coming of the hot water or other cooling medium in the radiator into contact therewith.

In the form of our invention illustrated in Figures 4 and 9 the main body part 10 is substantially the same as in Figures 1 to 3, as is also the rubber ring 15 and the fiber disc 19. This form, however, has an internal depending boss 28 having a square shoulder 29 at its lower end; and the locking member 30, while in the form of an integral pressed metal part as in Figures 1 to 3, has a central neck 31 which fits closely about the boss 28; and the periphery thereof is substantially cylindrical in form, as indicated at 32, which periphery fits within the upper end of the filling conduit and forms a somewhat more effective guide for positioning the cap relative to the filling conduit of the radiator. The locking member has a square hole 33 which fits about the square shoulder 29, and integral lugs 34 at its lower end like the lugs 22; and the parts are held together by a screw 35 or by equivalent means as in the form of our invention first described, as will be understood.

In the form of our invention illustrated in Figures 5 to 7 a gasket ring 36 of rectangular cross section takes the place of the circular packing ring 15 and inasmuch as this ring fits closely in a correspondingly shaped channel in the head of the body 11, there is less space to accommodate yielding and distortion of this yieldable member than in the forms hereinbefore described. Additional yielding is therefore provided by an element the equivalent of the lugs 22 and 34 and which is itself yieldable.

In this form a fiber disc 37 is placed beneath the ring 36, and is pressed against the ring by the upper end of the neck 20 during the placing of the cap on the neck, the same as in the forms first described; although the periphery of the disc is not forced upward so far in this form as in the forms first described. In this form the cup-shaped locking member is somewhat differently shaped, and takes the form of a circular and somewhat flatter dish-shaped pressed metal member 38 the periphery of which engages the fiber disc 37 to hold it in place, and which member is provided with a transverse recess 39 in its underside. Lying within this recess is a transverse resilient bar member 40 which extends beyond the periphery of the member 38, and the ends of which form lugs like the lugs 22 and 34 of the forms of our invention first described. This bar member, being yielding and resilient in itself, therefore adds its effect to that of the ring 36 and provides a total yielding of the parts during the securing of the cap on the neck 20 to approximately the same extent as in the forms of our invention first described, wherein the yielding and resilient effect is due entirely to the rubber ring 15.

In this form the member 38 has a square hole 41 which engages a square abutment 42 to prevent rotation between the parts, and the transverse recess 39 causes the bar 40 to rotate with the body 11 as will be understood. The parts are held together by a screw 43 and washer 44 as in the forms of our invention first described, the arrangement of the parts being such that the periphery of the member 38 presses firmly against the underside of the disc 37 to hold it in place as indicated in Figure 5. The lug and slot arrangement of the neck 20 are the same in all forms of our invention, as will be understood.

The yieldable rubber or equivalent ring member instead of lying within a groove provided for it in the underside of the body member may lie in the corner between the body member and the annular flange at the periphery thereof, as illustrated in Figure 8 wherein 45 is the body member, 46 the flange, 47 the ring member and 48 an indurated fiber disc the periphery of which contacts with the ring member as in the other forms of our invention. In this form the flange 46 is intended to fit closely about the outside of the upper end of the filling neck to thereby guide the cap; and the same is held in place by a transverse bar 49 the ends of which provide lugs for engaging lugs inside the neck as in the other forms of our invention. The bar fits about a depending boss 50, and is made to rotate with the cap by a member 51 having a pin and slot connection therewith at 57; said member 51 having a hole which engages a square shoulder 52 at the lower end of the boss 50. A tubular washer 53 surrounds the boss 50, and the several parts are held together by a screw 54 which enters a threaded passage in the boss 50 in substantially the same manner as in the other forms of our invention hereinbefore described.

Having thus described and explained our invention we claim and desire to secure by Letters Patent:

1. In a radiator cap of the class described, a body part having a head provided with an annular groove in its inner face; a yieldable resilient ring member within and filling said groove; a sealing disc within the cap and beneath, and the periphery of which contacts with said ring; a locking member beneath said disc and abutting against the underside thereof; oppositely disposed lugs associated with said locking member and adapted to engage lugs at the upper end of a radiator filling conduit; and means for holding said parts together.

2. In a radiator cap of the class described, a body part having a head provided with an annular groove in its inner face, and a central boss having a square part at its lower end; a yieldable resilient ring member within and filling said

groove; a sealing disc within the cap and beneath, and the periphery of which contacts with said ring; a cup-shaped pressed metal locking member beneath said disc and acting to hold said disc in place, said locking member having a square hole for receiving the square part of the boss aforesaid; oppositely disposed lugs associated with said locking member and adapted to engage lugs at the upper end of a radiator filling conduit; and means for holding said parts together.

3. In a radiator cap of the class described, a body part having a head provided with an annular groove in its inner face, a central boss having a flat lower face, and a driving part below said flat lower face; a yieldable resilient ring member within and filling said groove; a disc within the cap and beneath, and the periphery of which contacts with said ring, and the central part of which disc has a hole for receiving the driving part of said boss and bears against the flat face aforesaid; a cup-shaped pressed metal locking member beneath said disc and abutting against the underside thereof, and having a hole for receiving the driving part of the boss aforesaid; oppositely disposed lugs formed integrally with said locking member and located at the lower end thereof; and a screw extending into a threaded passage in said centrally arranged boss for holding said parts together.

4. In a radiator cap of the class described, a body part having a head provided with an annular groove in its inner face, and a central boss having a threaded passage; a yieldable resilient ring member within and filling said groove; a disc within the cap and beneath, and the periphery of which contacts with said ring; a cup-shaped pressed metal locking member beneath said disc and abutting therewith, to thereby hold said disc in place; oppositely disposed lugs adjacent the lower end of said locking member and formed integrally therewith; and a screw extending into the threaded passage in the boss aforesaid for holding said parts together.

5. In a raidator cap of the class described, a body part having a depending flange; a resilient ring associated with said body part and arranged within said flange; a central boss having a threaded passage; a disc within the cap and beneath, and the periphery of which contacts with said ring; a cup-shaped pressed metal locking member beneath said disc and abutting therewith, to thereby hold said disc in place, and which member has a transversely extending recess in its underside; a resilient bar lying within said recess and extending beyond the periphery of said locking member to thereby provide lugs adapted to engage lugs at the upper end of a radiator filling conduit; and a screw extending into the threaded passage in the boss aforesaid for holding said parts together.

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