A. H. WALINE AND T. M. ROBERTS.

RADIATOR CAP.

APPLICATION FILED MAR. 24, 1919.

1,402,125. Patented Jan. 3, 1922.

Fig. 1.

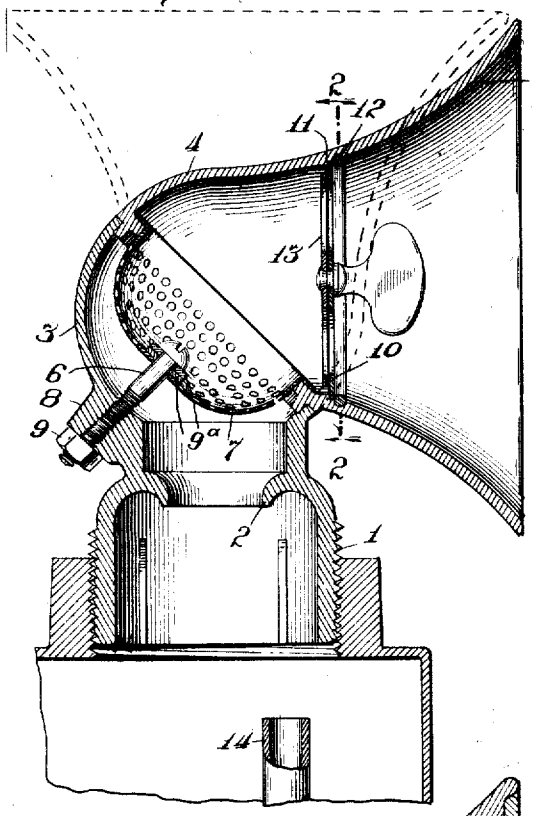


Fig. 2.

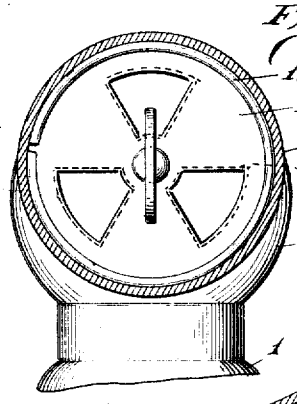


Fig. 3.

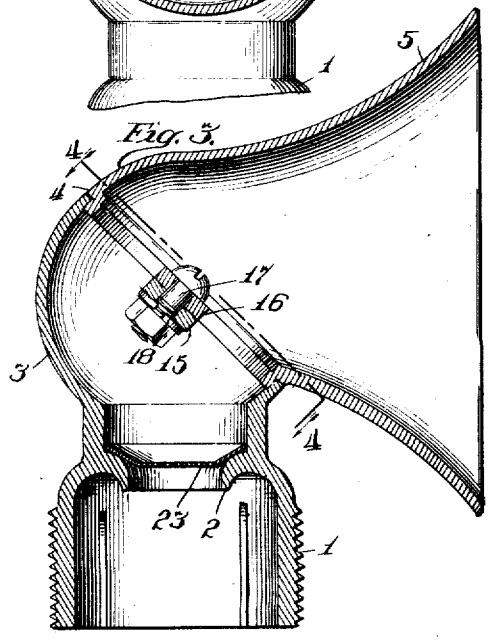


Fig. 5.

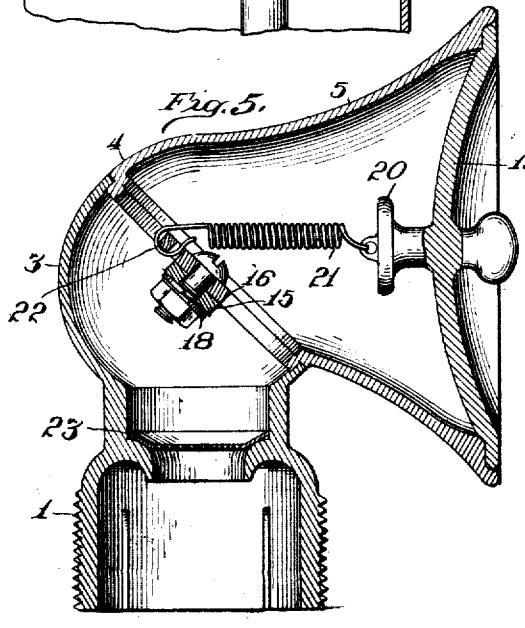
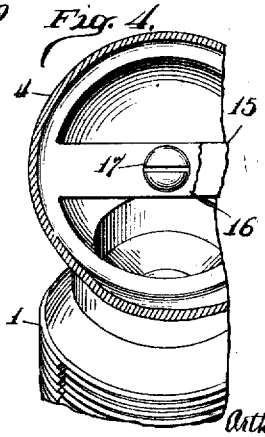


Fig. 4.



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RADIATOR CAP.

1,402,125. Specification of Letters Patent. Patented Jan. 3, 1922.

Application filed March 24, 1919. Serial No. 284,663.

To all whom it may concern:

Be it known that we, ARTHUR H. WALINE and THOMAS M. ROBERTS, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Radiator Caps, of which the following is a specification.

Our invention relates to a cap or closure which is intended to replace the ordinary plain radiator cap used to close the water inlet of the radiator of an automobile, and is designed to perform certain useful functions in addition to that of closing the opening. It is well known that under extreme conditions the gasoline engine of an automobile may become heated beyond a point within control of the ordinary capacity of the radiating system, from which a number of injurious and detrimental effects result. In our novel radiator cap structure we have provided a forwardly directed ventilator funnel designed to relieve the radiator of steam caused by the excessive heat and to assist in cooling the water in the radiator, and this funnel is capable of being turned to a vertical position in which it is useful as a water funnel when the supply of water in the radiator is being replenished. The object of our invention is the production of a radiator cap having the structure and useful characteristics above mentioned, and which shall be simple, practical, efficient and desirable in construction and arrangement, and ornamental in appearance. With the foregoing object and incidental objects and advantages in view, we have designed and invented the novel radiator cap shown in the accompanying drawings, and hereinafter more fully described, the essential elements of our invention being pointed out in the appended claims, it being understood, however, that changes in details and the specific form of our construction may be made without departing from the substance of our invention or the scope of the claims.

Of the drawings, Fig. 1 is a central, vertical section of a preferred form of our invention, in a plane running longitudinally of the automobile; Fig. 2 is a section on the line 2—2 of Fig. 1, looking in the direction of the arrow and showing the shutter construction; Fig. 3 is a central vertical section of a modified form of construction, in a plane corresponding to that of Fig. 1; Fig. 4 is a fragmentary section on the line 4—4 of Fig. 3, looking in the direction of the arrow; and Fig. 5 is a view corresponding to Figs. 1 and 3 and illustrating another modified form of our invention.

The same letters of reference indicate the same parts in all the figures of the drawings.

The base portion 1 of the base member of our novel cap is screw-threaded to engage the regular threaded opening of the radiator of the automobile upon which it is adapted to be used, and preferably is made tight-fitting and formed of resilient metal and slitted longitudinally, as shown, so that it will be held frictionally in any position to which it may be turned in the screw seat. Internally the base is formed with a recurved annular flange 2 which acts to deflect and turn backdownwardly any waves which may dash upwardly against the sides of the cap. Above the throat formed by this flange the body 3 of the base member is of a hollow or bowl-shaped form, the circular periphery of this body portion forming a seat inclined at an angle of 45° from the horizontal and being arranged to receive and rotatably engage the shouldered base portion 4 of the funnel 5, the axis of which extends horizontally and the mouth of which opens forwardly when the funnel is in the position shown in Fig. 1 of the drawing. The funnel member is yieldingly held upon its seat in rotatable relation to the base member by means of a screw bolt 6 which extends axially of the joint or seat and which is secured to the body 3 and rotatably engages a cupped foraminous screen member 7 made of elastic sheet metal. Preferably, and as shown, the bolt 6 makes screw-threaded engagement with an internally-threaded boss 8 formed on the body 3, and a lock nut 9 is provided to hold the bolt rigidly in place. Washers 9^a are provided to relieve friction at the pivotal engagement of the spring screen with the bolt, so that as much as possible of the frictional resistance to rotation of the funnel member may be exhibited at the circular joint between the base and funnel members.

Passage of air through the funnel 5 is governed by means of a shutter device (see Figs. 1 and 2), consisting of a circular plate 10 seated against a shoulder 11 formed in the neck of the funnel opening and held in place by a spring ring 12 engaging a groove in such neck on the opposite side of the plate, and a circular shutter 13 pivoted

axially to said plate 10 and equipped with a thumb-piece for turning it. The plate and shutter members are formed in a well known manner with fan-shaped openings separated by fan-shaped uncut portions of the same or slightly greater size, so that by rotation of the shutter the openings may be brought into registration, or may be closed by adjacent uncut portions, as desired.

It is obvious that when the automobile is traveling, with the parts in the position shown in Fig. 1 and the shutter open, air will be forced downward into the top of the radiator, condensing the steam and cooling the water and finding a vent through the overflow tube 14 of the radiator structure. The shutter opening may be restricted as desired to modify this action, or entirely closed, or the funnel opening may be turned to the rear to prevent any cooling action. When it is desired to replenish the radiator with water, the funnel may be rotated through an arc of 180° to bring it to the upright position shown in dotted lines in Fig. 1, in order that it may serve as a water funnel.

In Figs. 3 and 4 we have shown a modified form of construction in which the funnel member is secured to the base member in a different manner. In this modification the funnel member and base member are formed adjacent the joint between them with cross bars, marked 15 and 16 respectively, which bars are pivotally connected at the axis of the joint by a bolt 17, a spring washer 18 or other elastic member being interposed in the pivot joint connection to yieldingly restrain relative rotation of the connected parts. With this construction the funnel will at all times induce a cooling action upon the contents of the radiator when directed forwardly.

In Fig. 5 we have illustrated another modification of our invention in which the funnel member is rotatably secured to the base member by a short bolt passing through cross bars 15 and 16 on the two members, as in the modification shown in Figs. 3 and 4 and already described, and in which the funnel opening is controlled through a cover plate 19 having an inner flanged stem 20 connected by a coiled spring 21 with the pivoted structure. In the construction illustrated the spring is anchored to a lug 22 on the bar 16. When it is desired that air shall pass through the funnel into the top of the radiator, this cap may be drawn outwardly and the lower edge rotated rearwardly so that the lower half of the cover plate will hook into the space between the funnel and base members of the device (when the funnel is in horizontal position), in which position it will be retained by the tension of the connected spring.

In the modified forms of our device illustrated in Figs. 3 to 5, inclusive, a screen 23 is preferably used just above the throat of the base member to act as a strainer when the radiator is being filled and also serve to break up waves which may be thrown up against the opening.

We claim:

1. A radiator cap comprising a vertical hollow base member, a funnel member communicating therewith and rotatably engaging said base member on an axis oblique to the axes of both said members, a spring member extending diametrically across the inner end of said funnel member adjacent the joint between the members, and a bolt engaging said spring member and said base member and extending axially of the joint.

2. A radiator cap according to claim 1 in which the bolt makes screw-threaded engagement with the base member.

3. A radiator cap according to claim 1 in which the spring member is a foraminous sheet of resilient metal constituting a screen.

4. A radiator cap according to claim 1 in which the inner end of said funnel member is formed with a circular ledge and the spring member is a cup-shaped foraminous sheet of resilient metal having a peripheral flange engaging said ledge.

5. A radiator cap according to claim 1 in which the bolt is headed and friction-reducing washers are interposed between such bolt and the spring member.

6. A radiator cap comprising a vertical hollow base member, a funnel member communicating therewith and rotatably engaging said base member on an axis oblique to the axes of both said members, and spring means for yieldingly and frictionally maintaining said members in engaged relation.

7. A radiator cap comprising a vertical hollow base member, a funnel member communicating therewith and rotatably engaging said base member on an axis oblique to the axes of both said members, and means including a pivot bolt extending axially of the joint between said members and also including a spring cooperating with said bolt for yieldingly and frictionally maintaining said members in engaged relaton.

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