Oct. 20, 1925. 1,557,911

J. F. WHITE

RADIATOR CAP

Filed June 30, 1921

Fig. 1

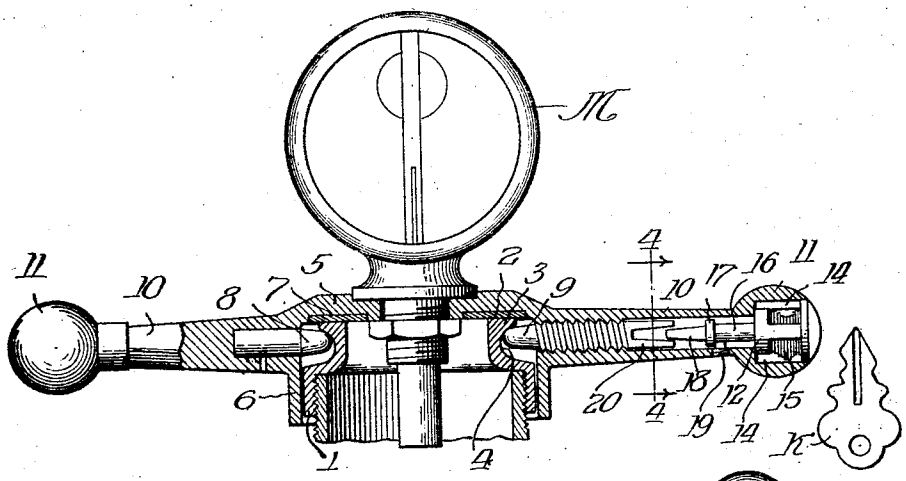



Fig. 2

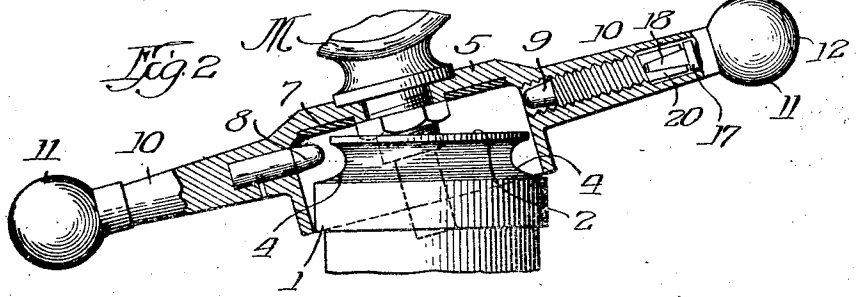



Fig. 3

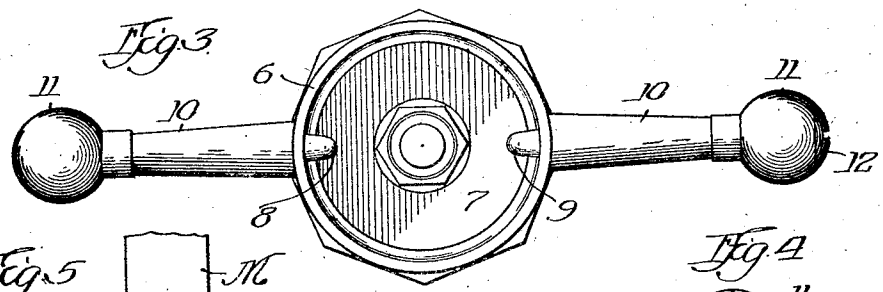



Fig. 5

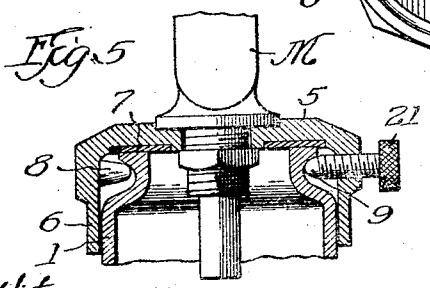
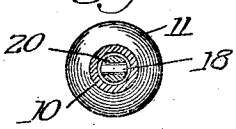



Fig. 4




Inventor
John F. White,

Witness:
Geo. C. Davison

By Cromwell, Freiss & Warden
Attys.

Patented Oct. 20, 1925. 1,557,911

# UNITED STATES PATENT OFFICE.

JOHN F. WHITE, OF CHICAGO, ILLINOIS, ASSIGNOR TO WHITE PRODUCTS COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

## RADIATOR CAP.

Application filed June 30, 1921. Serial No. 481,510.

*To all whom it may concern:*

Be it known that I, JOHN F. WHITE, a citizen 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.

This invention relates to improvements in closures of a sort especially designed and adapted for use as caps for closing the nipple of automobile radiators in which employment it is specially adapted also to function as a retaining connection for an ornament, and an operative mounting and securing means for a display device such as an ornament or an indicating device of the sort known in the trade as a motometer.

The general purpose of the invention is the provision of an improved form of closure adapted specially for the purpose described, which may be quickly and easily removed when desired, and yet may be readily secured in place so as to effectively prevent unauthorized removal.

A more particular object of the present improvement is the provision of a closure having these characteristics, which is adapted to form a tight and effective closure for the radiator tube, so as to insure proper operation of a condensing cooling system, when utilized, and to assure accurate operation of a moto-meter supported on the closure in the customary operative association with the radiator nipple.

Another particular object of the present invention is the provision of such a closure which is adapted for use upon the various sorts and sizes of radiator nipples now employed in different makes of automobiles, without requiring any special fitting or modifications of the radiator nipple, and without any modification of the external appearance thereof, other than that contributed by the form of the closure itself and the instrument or ornament carried upon the same.

Another object of the invention is the provision of such a closure having the aforementioned characteristics, and which in addition thereto adapts itself to graceful and pleasing contour and design, so that in itself it constitutes an effective and ornamental finishing mounting for the hood of an automobile.

Another object is the provision of such a closure which can be manufactured at low cost and installed with ease.

Other and further objects and advantages of the invention will be pointed out hereinafter, indicated in the appended claims, or obvious upon an understanding of the invention from the present disclosure. In consideration of the latter, it is to be understood that while I herein disclose two forms in which the invention may be embodied, the same are presented for the purpose of illustration merely, and are not intended to be exhaustive of the possible variations in its embodiment; nor is the disclosure of these particular forms to be considered as a limitation upon the invention as hereinafter claimed such as would operate to restrict it short of its true and most comprehensive scope in the art.

In the drawing forming a part of this specification,

Fig. 1 is a sectional elevation of an automobile radiator cap embodying my invention, showing the closure in place;

Fig. 2 is a detail in the nature of a similar section showing the manner in which the cap is operated in placing it in position and in removing it;

Fig. 3 is a bottom view of the cap member;

Fig. 4 is a section on the line 4—4 of Fig. 1; and

Fig. 5 is a sectional elevation of a modified form.

In the provision of a fully successful closure cap for automobile radiator tubes, it is important that the device be effective to form a tight closure, and at the same time be readily removable when desired. It is important to have the closure tight, not only to prevent the leakage of water about the nipple, and the consequent fouling and disfiguration of the radiator and hood, but also in the event a moto-meter is depended upon to show the engine condition, that there be no steam leakage, as otherwise the moto-meter will not register accurately. Furthermore, when the cooling system is of the condensing type, it is essential that the closure be absolutely leak proof in order to keep the condensing system operative. Inasmuch as the fitted parts are subjected to moisture both internally and externally,

most frequently to water which is fouled with rust, it is important that the arrangement of the closure be such as to prevent its becoming stuck to the radiator tube by fouling, so that it may be readily removed by hand when desired, thus avoiding marring the appearance of the closure by use of a tool. Because of the portability and attractiveness of the moto-meters or other ornaments customarily mounted on radiator caps, they are particularly susceptible to theft, which circumstance renders it highly desirable that the connection of the radiator cap be such as to prevent its unauthorized removal. The improvements constituting the subject-matter of the present invention accomplish these several advantages in a highly satisfactory manner.

As illustrated in the drawing, the invention contemplates the provision of a suitable boss or nipple 1 which constitutes the mounting upon which the closure cap is secured. This nipple may be the radiator tube itself, or it may be in the nature of a collar adapted for permanent connection to any form of radiator tube by screw threads or other means. The latter form is illustrated in Fig. 1. This nipple is in the nature of a tubular member of circular cross-section and is characterized by having its upper portion of reduced diameter with the upper margin of its wall plane to constitute a packing surface, below which there is a peripheral overhanging portion constituting a retaining ledge 3. Below this retaining ledge 3 the nipple is reduced by an annular circumferential groove 4 of arcuate cross contour, so as to afford an inclined re-entrant wedging surface on the under side of the retaining ledge. The closure cap has a top portion 5 carrying a depending skirt portion 6 of cylindrical internal form, and of size to encompass closely the cylindrical outer wall portion of the nipple 1. The top portion 5 preferably is apertured axially to accommodate the mounting of a suitable ornament or instrument M, and said cap member is further qualified to retain a gasket 7 of material held in face contact against the top portion 5 and of suitable size to cover the end of the nipple 1. Projecting inwardly from the skirt portion 6 is a retaining member 8, disposed a sufficient distance below the top portion 5 to accommodate the upper marginal portion of the nipple 1 between said retaining member and the gasket 7 when the latter is somewhat compressed. The inner portion of this retaining member preferably is shaped to facilitate its riding upon the curved surface of the annular groove 4. At another point on the skirt portion 6, preferably diametrically opposite the retaining member 7, is a movable retaining member 9, which is mounted on the cap member in any convenient manner such as will permit its being moved inwardly to project into the interior of the cap, or retracted from such position. This movable retaining member is adapted, when in projected position, to occupy substantially the same relationship to the top portion 5 as does the retaining member 8, so as to accommodate the upper marginal portion of the nipple 1 between it and the gasket 7, its inner end cooperating with the wedging surface on the neck of the nipple to cause the top portion 5 to exert a wedging pressure on the gasket. The movable mounting of the member 9 may be accomplished by having it screw-seated in the cap member, as illustrated, suitable means being provided whereby it may be rotated to move to projected and retracted positions. In the embodiment illustrated in Fig. 1, the closure cap is shown provided with laterally extending arms 10 terminating in ornamental knobs 11. In addition to providing an attractive design, and affording means whereby the closure cap may be manipulated, these arms afford mounting places for one or both of the retaining members 8 and 9, providing a liberal amount of metal as supporting seats for said members. When the shiftable retaining member is so mounted, the arm 10 and knob 11 may be bored longitudinally, part of the former being screw-threaded to receive the screw-threaded portion of the shiftable retaining member, and the knob being bored to form a mounting for a lock cylinder 12, and slotted to provide seats 14 for the lock tumblers 15. The lock cylinder as shown carries an axial shaft 16 projecting into the bore of the arm and carrying a retaining collar 17 and slip-coupling member 18. A suitable pin 19 seated in the arm, by cooperation with the collar 17, prevents withdrawal of the lock cylinder. The slip-coupling member 18 is adapted for cooperation with a coupling portion 20 at the outer extremity of the shaft of the shiftable retaining member, so that rotary movement may be transmitted to the shiftable retaining member upon rotation of the lock cylinder 12, to accomplish longitudinal shifting of the retaining member while the longitudinal position of the lock remains unchanged. The lock is of a familiar tumbler type which, in locked position, is held against rotation by the seating of the tumblers 15 in one or both of the seats 14, from which position the tumblers are withdrawn upon insertion of a suitable key K whereupon the lock cylinder may be rotated freely in its seat, to accomplish the longitudinal shifting of the shiftable retaining member 9, as stated.

In the embodiment illustrated in Fig. 5, the retaining member 8 is formed as a cast lug on the inner wall of the skirt portion 6, while the shiftable retaining member 9 is

constituted of the inner extremity of a screw which is seated in the skirt portion 6 and is manipulated through instrumentality of its knurled head 21.

Other features of the construction of the device will be understood from Fig. 2 illustrating the manner in which the closure cap is applied to the nipple and removed therefrom. From this it will be obvious that the dimensions of the parts are such as to permit the closure cap being placed upon the nipple when the shiftable retaining member is retracted. This may be accomplished by tilting the closure cap in such relationship as to permit the retaining member 8 to move into the groove 4. As the cap is then pressed down to its horizontal position the inner portion of the retaining member 8 is rendered effective upon the wedging surface of the nipple to compress the gasket 7 between the packing surface 2 and the top portion 5. When the closure is in position to permit the shiftable retaining member to align with the groove 4, said member is moved to its projected position by manipulation as above described, in the course of such movement becoming effective upon the wedging surface in the groove 4 to compress the gasket 7 between the packing surface 2 and the cover portion 5. With the parts in such relationship, the cap affords a tight closure for the tube, and is securely retained in place. In the event the shiftable retaining member is lock-controlled, as illustrated in Fig. 1, the cap is retained against removal until the proper key is inserted for operation of the lock. Although the cap is thus secured in place and constitutes a tight closure, it is susceptible of angular adjustment upon the nipple upon application of sufficient force, whereby the ornament or instrument M or the manipulative arms 10 may be placed in the desired position. This capability of the closure cap for rotation upon the nipple constitutes one safeguard against injury, as it prevents the arms being subjected to injurious strains in an effort to remove the cap by rotary movement.

In the event the nipple 1 is applied to a radiator tube as an adaptor, it is desirable that the skirt portion 6 of the cap envelop the nipple to an extent precluding its engagement by an instrument effective to remove it. This is not necessary, of course, in instances where the permanently mounted tube itself is shaped to form the nipple 1. In the event a moto-meter is supported on the cap, its bulb is retained in proper operative position within the radiator tube when the cap is in secured position, while its dial is supported in the intended position for inspection from the vehicle.

Features herein disclosed but not claimed are claimed in my co-pending applications, Ser. No. 411,255, filed September 18, 1920; Ser. No. 419,402, filed October 25, 1920; and Ser. No. 420,549, filed October 29, 1920.

I claim:

1. In a closure of the sort described, the combination of a nipple affording a mounting, and a cap affording a closure for the nipple, said cap being provided with oppositely-extending arm portions whereby it may be manipulated, said nipple being provided with a peripheral retaining ledge, retaining members on said cap in alignment with respective arms thereof, said retaining members being engageable with said retaining ledge to hold the cap against removal from the nipple, and means operable in one of said arms for shifting one of said retaining members on the cap to permit removal of the cap from the nipple by movement imparted to the cap through the instrumentality of an arm.

2. In a closure of the sort described, the combination of a nipple affording a mounting, and a cap affording a closure for the nipple, said cap being provided with oppositely-extending arm portions whereby it may be manipulated, said nipple being provided with a peripheral retaining ledge, retaining members on said cap in alignment with respective arms thereof, said retaining members being engageable with said retaining ledge to hold the cap against removal from the nipple, shifting means operable in one of said arms for shifting one of said retaining members on the cap to permit removal of the cap from the nipple by movement imparted to the cap through the instrumentality of an arm, and locking means for controlling said shifting means.

JOHN F. WHITE.