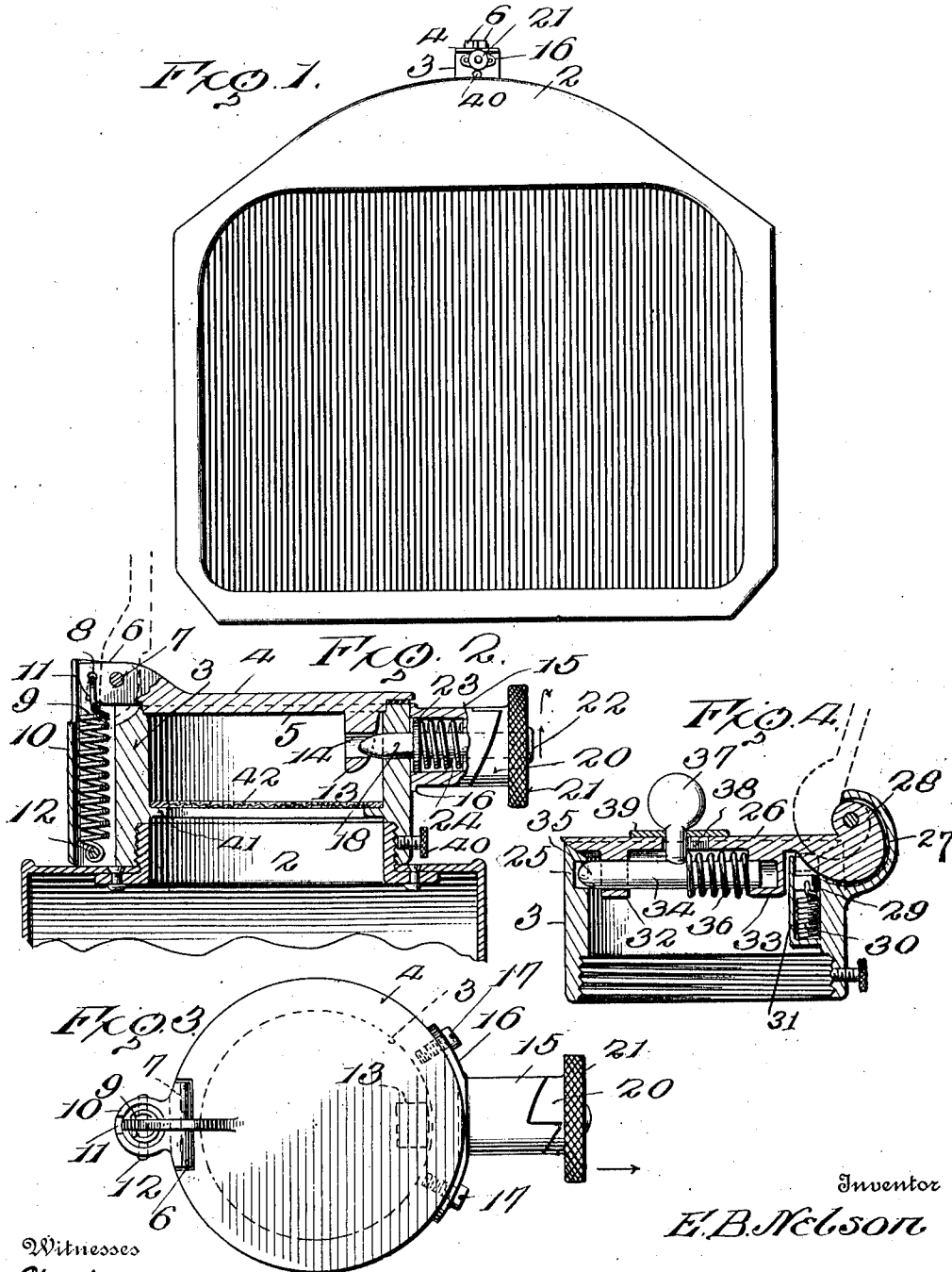


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RADIATOR CAP FOR AUTOMOBILES.
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UNITED STATES PATENT OFFICE.

EDMUND B. NELSON, OF CADIZ, OHIO.

RADIATOR-CAP FOR AUTOMOBILES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDMUND B. NELSON, citizen of the United States, residing at Cadiz, in the county of Harrison and State of Ohio, have invented certain new and useful Improvements in Radiator-Caps for Automobiles, of which the following is a specification.

My invention relates to caps which are used to close the water inlet opening of automobile radiators, and the object of my invention is to provide a cap of this character, formed with a hinged cover, the cover being provided with a spring acting to open it when the cover is released, and with a locking device whereby the cover is normally held closed so tightly as to prevent leakage of steam or water, but which may be opened without touching the cover itself, by simply operating the lock.

For a full understanding of the invention and the merits thereof, and to acquire a knowledge of the details of construction, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a front view of an automobile radiator with my improved cap applied thereto. Fig. 2 is a diametrical section of the cap, the latch being partly broken away. Fig. 3 is a plan view of the cap. Fig. 4 is a diametrical section of the modification.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to these figures, 2 designates the ordinary inlet tube of an automobile radiator, screw-threaded on its exterior. These tubes are ordinarily closed by a screw cap. After the automobile has been run for some time, these caps become extremely hot, and therefore are difficult to detach.

My improved cap consists of the cylindrical wall 3 which is screw-threaded on its interior to fit the pipe 2. The upper end of the inside face of the wall is slightly beveled so that the cap will fit down tightly thereon.

The cap is designated 4 and is provided with a central depressed portion 5 which fits down into the bevel on the inside face of the wall 3. The wall 3 is provided with the up-standing lugs 6 to which the cap is hinged by means of a pintle 7. The lugs are spaced from each other, and the cap is provided with a rearwardly extending ear 8 through

which the pintle 7 passes. The ear 8 is extended rearwardly beyond the pintle, and connected to it is a coiled retraction spring 9 whose lower end is attached in any suitable manner to the lower end of the wall 3. Preferably, the spring 9 is contained within a housing 10 which is formed in part of the wall 3 and which is slotted at its upper end, as at 11, to accommodate the rear end of the ear 8. The lower end of the spring 9 is held in place by a transverse pin 12. Diametrically opposite to the hinged portion of the cover 4 is the downwardly extending stud 13 which is formed with a bolt opening 14. The outer face of this stud is rounded at its lower end. In order to lock the cover in place, I provide a spring-impelled locking bolt or pin which is mounted in any convenient manner and which engages with the stud 3 when the cover is closed.

My preferable construction is shown in Fig. 2 in which 15 designates a sleeve formed with ratchet teeth upon its outer extremity. The inner end of the sleeve is provided with a base plate providing opposed projecting ears 16 through which pass screws 17 which engage with the wall 3. The sleeve 15 is hollow, and passing through it is a locking pin 18 whose inner end is rounded or beveled, as at 19; and engages with the perforations in the stud 13. The pin projects at its outer end beyond the end of the sleeve 15 and is provided with ratchet teeth which abut against and correspond to the ratchet teeth on the sleeve 15. These ratchet teeth are preferably formed on the inner face of a sleeve 20 which surrounds the extremity of the pin and to which is attached a knurled head 21 by which the sleeve 20 may be rotated relatively to the sleeve 15. Preferably, the pin passes through the head and is enlarged at its extremity, as at 22, so that when the head is forced outward, the pin will also be forced outward, though the head may be rotated freely upon the pin without turning the latter. The pin is formed with a collar or shoulder 23, and placed between the shoulder 23 and the extremity of the sleeve 15 is the coil spring 24 which acts to force the pin inward. The operation of this form of my invention will be obvious. Under ordinary circumstances, the cover is closed and the spring 24 acts to hold the pin 18 into engagement with the stud 13. When, however, the knurled head 21 is rotated, the cam-like faces of the

ratchet teeth on the head will engage the cam-like faces of the sleeve 15, and as a result, the pin will be retracted as the head is rotated. As soon as the pin has been

5 completely retracted from the stud 13, the spring 9 will act to throw the lid or cover 4 entirely open. The tapering form of the end of the pin will cause it to take up wear so that the lid will always be brought
10 tightly down into engagement with the upper end of the wall 3, thus making a steam- and water-tight joint. Packing may also be used between the lid and the wall 3.

In Fig. 4 I show another form of my invention. In this form, the wall 3 is formed with the tapering perforation 25. The cover 26 is hinged within a curved housing 27, but is formed with a rounded cam 28, just inward of its hinge. The rounded face of this
20 cam 28 bears against a spring-pressed plunger 29 which is carried by a coil spring 30. This coil spring is preferably mounted in a cylindrical casing 31 which is attached to or formed in part with the inside face of the
25 wall 3. This casing is slotted at its inner side to accommodate the downwardly projecting cam 28 when the lid is closed. Mounted upon the under side of the lid in guide eyes 32 and 33 is the locking pin 34 which is rounded at its extremity, as at 35, to en-
30 gage with the perforation 25. This locking pin is forced outward by a coil spring 36 which surrounds the pin, the other end of the spring being engaged against the inner
35 end of the guide eye 33. The locking pin is provided with a finger piece 37 which projects out through a slot 38 in the lid 26. The outer end of the finger piece is enlarged between its enlarged outer end and the shank
40 of the finger piece, and resting upon the outer face of the lid 26 is the sliding cover plate 39 which covers the slot 38. In this form of my invention, the spring 36 tends to force the bolt outward and therefore
45 keep in engagement with the perforation 25 when the lid is closed. As soon, however, as the locking pin is drawn back, the spring 30 will act to force the lid open.

It will be seen that in both forms of my invention, the lid is held in tight engagement with the wall 3, by reason of the beveled or rounded extremity of the locking pin. In both forms of my invention also, it will be
50 seen that the means whereby the lock is operated is so exposed to currents of air, and is so separated from the wall 3 and from the lid itself as to be at all times cool so that the bolt-operating means may be touched without chance of burning the hand.

60 The construction first shown and described has one advantage over that last described, in that the head 21 may be rotated to the degree required to retract the pin, and then be left in this position so that the cap may
65 then be forced down and the head 21 turned

a trifle farther until the ratchet teeth of the sleeve 20 slip into locked engagement with the ratchet teeth on the sleeve 15.

In order to provide means whereby the cap may be set with the knurled head 21
70 projecting in any convenient direction, I provide a set screw 40 which, after the cap is rotated to the proper position, will hold the cap set. The wall 3 is also provided with an inwardly projecting flange 41 form-
75 ing a shoulder upon which the strainer 42 may be supported.

My invention is simple, may be cheaply made, is easily applied to all automobile radiators now in use, and is entirely effective in practice.
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Having thus described the invention, what I claim is:—

1. A cap of the character described comprising a cylindrical wall, a lid fitting the
85 upper end of the wall and hinged thereto, and formed with a downwardly extending perforated lug, the face of said lug being rounded, a spring acting to throw the lid open, a cylindrical casing mounted on the
90 wall of the cap and extending radially outward therefrom, the end of said casing being formed with an inclined cam face, a longitudinally movable locking pin disposed within said casing extending through the
95 wall of the cap and having a tapered end adapted to engage in the perforated lug of the lid, a spring housed within the cylindrical casing and acting to force the pin inward, and a head mounted on the pin and
100 rotatable therewith, said head having a cam face mating with the cam face on the end of the cylindrical casing whereby the head when turned will act to move the pin outward from its engagement with the said lug.
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2. A cap for the purpose described comprising a cylindrical wall having a spring casing formed on the exterior thereof and extending parallel with the axis of the wall, a spring located within the said casing, a
110 lid pivoted on the wall and closing against the same and provided with a projecting portion at its rear end and beyond the hinge with which the spring engages, the free end of the lid being formed with an inwardly
115 projecting lug having a curved face, a cylindrical casing on the wall of the cap extending radially out therefrom, the outer end of said casing being formed with a plurality of cam faces, a pin disposed within
120 the casing and having a tapered end projecting through the wall of the cap and engaging the perforated lug of the lid, and a head on the outer end of the pin having a tubular inwardly projecting hub the same
125 size as the cylindrical casing and formed with corresponding cam faces.

3. A cap of the character described, comprising a cylindrical wall, a lid hinged to the upper end of the wall, a spring-actuated,
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radially movable, rotatable locking pin mounted on the wall and passing there-through and engaging said lid to hold it closed, a housing surrounding the pin and 5 provided with means engaging the pin for causing a retraction of the pin when the pin is rotated.

4. A cap of the character described, comprising an annular wall, a lid pivoted on the 10 wall and closing against the same, a spring urging the lid to an open position, a keeper on the lid, a casing formed on said wall and extending radially out therefrom, the outer end of said casing being formed with 15 a cam face, a spring-actuated pin disposed within the casing and projecting through said wall and engaging said keeper, a head on the outer end of the pin having an inwardly projecting hub formed with a cam 20 face corresponding to the cam face on the cylindrical casing.

5. A cap of the character described, com-

prising an annular wall, a lid hinged upon the upper end of the wall, a vertically disposed housing formed upon the wall, a ver- 25 tically disposed spring located within the housing and engaging said lid to force it open, a keeper on the lid, a radially extending casing formed upon said wall, a spring-actuated pin mounted in said casing and 30 projecting through the wall and engaging said keeper, and a head on the end of the pin, the extremity of the said casing and the opposed face of the head being formed with corresponding cam faces whereby the 35 pin may be retracted upon a rotation of the head.

In testimony whereof I affix my signature in presence of two witnesses.

EDMUND B. NELSON. [L. S.]

Witnesses:

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