Dec. 18, 1928. 1,695,827

H. E. SIPE

SIGNAL DEVICE

Filed Dec. 1, 1927

Fig. 1.

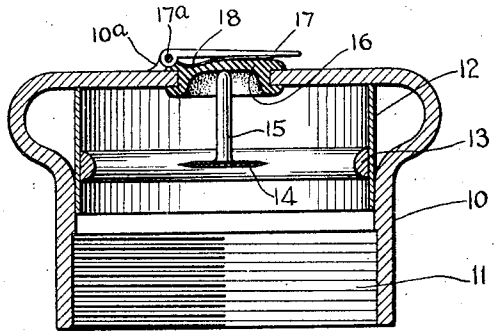


Fig. 2.

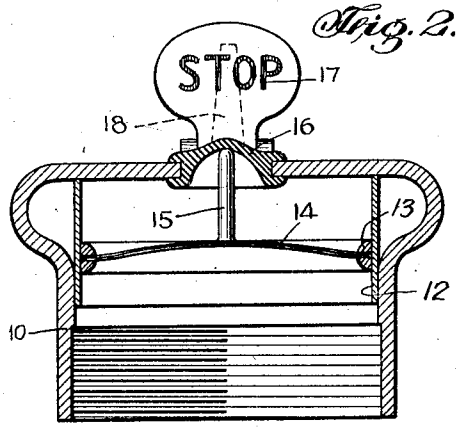


Fig. 3.

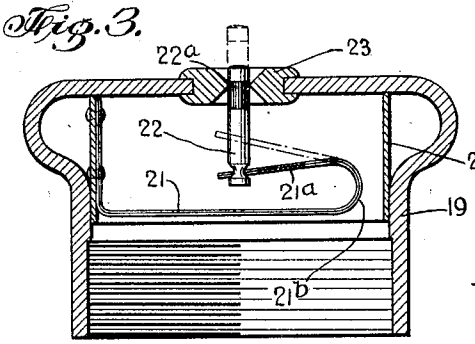
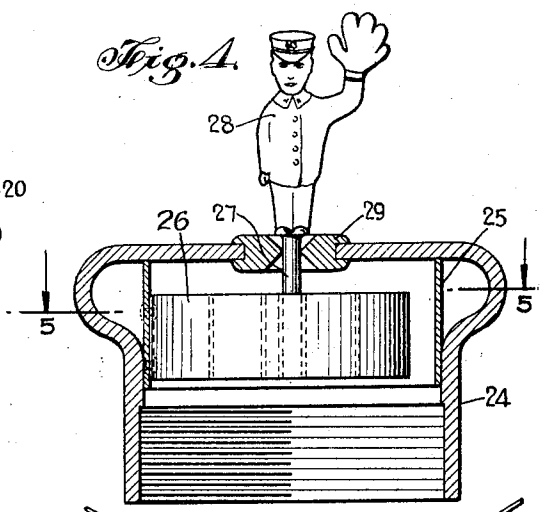


Fig. 4.



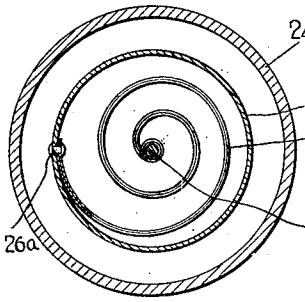


Fig. 5.

Fig. 7.

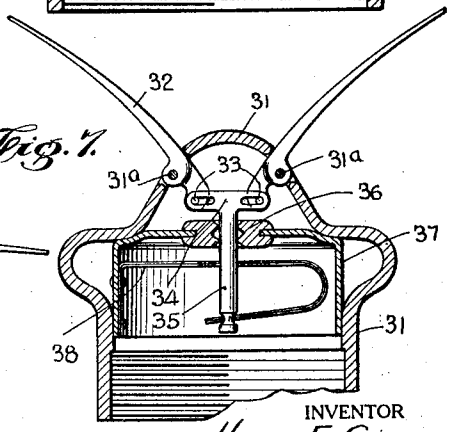
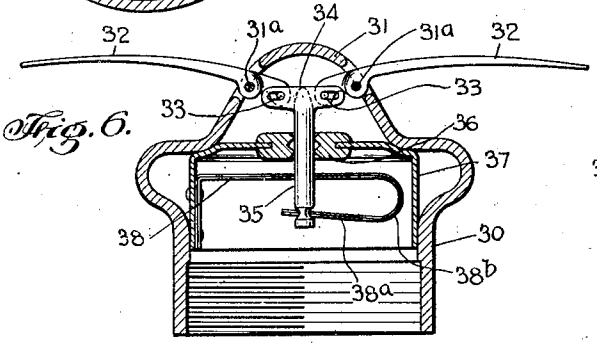


Fig. 6.



INVENTOR
Harry E. Sipe
BY
Howard C. Thompson
ATTORNEY

Patented Dec. 18, 1928. 1,695,827

UNITED STATES PATENT OFFICE.

HARRY E. SIPE, OF NEW YORK, N. Y.

SIGNAL DEVICE.

Application filed December 1, 1927. Serial No. 236,954.

This invention relates to signal devices and particularly to devices of this class for use in connection with the caps of radiators of motor vehicles and comprising movable signal elements, and means exposed to the chamber of the radiator and actuated by the prevailing temperature in said chamber for moving the signal element into position to indicate the existence of excess heat within said chamber; a further object being to provide a device of the class specified, the operative element or member of which may impart to the signal device, a sliding or rotary movement or may actuate levers or release a tensionally actuated device, said operating member being preferably bimetallic and of such structure as to be sensitive to operation when exposed to predetermined degrees of heat; a further object being to provide means mounted within the cap of the radiator for supporting the operating member and the signal device to permit of the movement thereof; and with these and other objects in view, the invention consists in a device of the class and for the purpose specified, which is simple in construction, efficient in use, and which is constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:

Fig. 1 is a sectional view of a cap showing one method of carrying my invention into effect.

Fig. 2 is a view similar to Fig. 1 with the parts in a different position, the section being at right angles to that shown in Fig. 1.

Fig. 3 is a view similar to Fig. 1 but showing a modification.

Fig. 4 is a view similar to Figs. 1 and 3 but showing another modification.

Fig. 5 is a section on the line 5—5 of Fig. 4.

Fig. 6 is a view similar to Fig. 1 but showing another modification; and,

Fig. 7 is a view similar to Fig. 6 with the parts in a different position.

In Figs. 1 and 2 of the drawing, I have shown at 10, the cap of a radiator of a motor vehicle, which in the construction shown is internally threaded at 11 for mounting in connection with the threaded extension of the radiator. Mounted in the upper end portion of the cap is a sleeve 12 which is provided on its inner wall with a ring or bead 13. Mounted in this ring or bead and extending centrally and transversely through the chamber within the cap which is exposed to the chamber of the radiator, is a bimetallic strip 14 capable of upward flexing as seen in Fig. 2 of the drawing when subjected to predetermined degrees of heat. The central portion of the bimetallic strip 14 is provided with an upstanding pin or finger 15 which is adapted to operate in connection with a flexible or rubber cap 16, mounted centrally of the cap 10 and in the top wall thereof. When the bimetallic strip 14 flexes upwardly, the pin 15 is correspondingly moved upwardly, and raises the flexible wall of the cap 16, and releases the signal element 17 which is moved into vertical or upright position by a spring 18 supported in connection therewith, the free end of the strip cooperating with the pivot 17^a of the element 17 to retain the same in depressed position, but when raised slightly, the spring will function to throw the element 17 into vertical position and to support the same in such position until it has been returned to inoperative position by hand. The pivot 17^a is formed by a pin which passes through the element 17 and lugs 10^a on the top wall of the cap 10.

In Fig. 3 of the drawing, I have shown a slight modification of the structure shown in Figs. 1 and 2 wherein a cap 19 is provided with a sleeve 20 adjacent the upper end thereof, and mounted within the chamber of said cap. This sleeve supports a bimetallic arm 21 having a flexible end 21^a formed by a loop 21^b in said arm. Supported in connection with and movable relatively to the end portion of the flexible end 21^a is a signal element 22 in the form of a pin or bar, movable upwardly through a ring or washer 23 mounted in the top wall of the cap 19, the washer being preferably composed of resilient material to form a seal between the same and the pin 22. The pin or signal element 22 is provided with a colored section 22^a normally contained within the boundaries of the cap 19, and in the action of the flexing end 21^a of the bimetallic arm 21 is extended beyond the cap to indicate the presence of excess heat within the chamber of the radiator which is exposed to the chamber of the cap in which the bimetallic arm is mounted. With this construction, the cooling of the temperature within the radiator will automatically return the pin or signal element 22 to its inoperative position.

In Fig. 4 of the drawing, I have shown a

cap 24 in which is mounted a ring 25 which supports a bimetallic signal actuating member 26 in the form of a spiral member one end of which is secured to the sleeve 25 as shown at 26ª, and the other end of which terminates centrally of the cap 24 and is secured to the rod 27 of a signal device 28, the rod passing through a ring or washer 29 in the top of the cap 24. The part 28 of the signal device which protrudes through the cap is preferably characterized to represent a figure, which when moved into one position, will face the operator of the vehicle and indicate danger or the existence of excess heat within the chamber of the radiator, it being understood that as the bimetallic member, in the form of a spiral is exposed to heat, the rod 27 and signal 28 is rotated within the cap, and the degree of this rotation may be governed by the structure of the bimetallic member and the number of coils in the spiral, and the signal element may be rotated a quarter or a half revolution as may be desired.

In Figs. 6 and 7 of the drawing, I have shown another form of construction employing a cap 30 which has at its upper end, a dome portion 31, in the opposite side walls of which are pivotally mounted as seen at 31ª, levers 32, the outer end portions of which may be characterized in any desired manner to give ornamental appearance thereto. The inner ends of said levers are pivoted and slidably coupled as seen at 33, to the crosshead 34 of a sliding rod 35 which passes through a packing and guiding ring 36 mounted in a cup-shaped member 37 which is supported in the upper end portion of the cap 30. Supported in connection with said cup-shaped member is a bimetallic operating element 38 having a freely flexing end portion 38ª formed by a loop 38ᵇ in said element, and contrasting to the structure shown in Fig. 3 of the drawing, the flexing end 38ª moves downwardly when subjected to predetermined degrees of heat instead of upwardly as with the flexing end 21ª of the arm 21. In this downward movement, the crosshead 34 is also moved downwardly with the pin 35 and the protruding ends of the levers 32 are raised from the position shown in Fig. 6 of the drawing to the position shown in Fig. 7 of the drawing to indicate to the operator of the vehicle that an excess degree of heat exists in the radiator.

From the foregoing, it will be apparent that in all forms of construction, the bimetallic element, regardless of the character or contour thereof, when subjected to heat beyond a predetermined degree, is actuated to impart movement to a signal device, and this movement may be sliding or rotary as the case may be, and such sliding or rotary movement may be transmitted directly or indirectly to the signal device, per se. As will be apparent, the bimetallic element or member employed may be also automatically operated to return the signal elements to inoperative position as in Figs. 3, 4 and 6 of the drawing, or the signal device may be returned to inoperative position by hand as in Fig. 1 of the drawing.

With my improved construction, it will be understood that I provide a very simple and yet positively functioning means for indicating to the operator of the vehicle, when an engine has become overheated by virtue of the existence of excess heat in the radiator of the engine. While I have shown and described one primary method of carrying my invention into effect, and one specific use or application thereof, it will be understood that I am not necessarily limited in this respect, as the signal device and the bimetallic element for actuating the same may be employed in connection with other apparatus, and as a matter of fact, the device may be employed to indicate, by virtue of the danger signal or the movement of a signal into predetermined position, both the increase or decrease of temperature in action upon a bimetallic element or the equivalent of such an element, and various other changes in and modifications of the construction herein shown and described may be made within the scope of the appended claims, without departing from the spirit of my invention or sacrificing its advantages.

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

1. A signal device for radiator caps, said cap having a chamber opening into the chamber of the radiator and said device comprising a bimetallic member arranged in said chamber in a plane transversing the axis of said cap and actuated by the temperature conditions existing in the chamber of the radiator and extending into the chamber of said cap, a signal element in operative connection with said bimetallic member whereby when said member is exposed to predetermined degrees of heat, said signal element will be moved into operative position, the coupling of said element with said member being such as to automatically return the signal element into inoperative position when the temperature in said chambers is lowered, said signal element involving a member slidably engaging said radiator cap and means for forming a seal around said sliding member, said bimetallic member constituting a striplike body, and means involving a tube inserted into the cap for supporting one end of said striplike body.

2. A signal device for radiator caps, said cap having a chamber opening into the chamber of the radiator and said device comprising a bimetallic member arranged in said chamber in a plane transversing the axis of said cap and actuated by the temperature conditions existing in the chamber of the radiator and extending into the chamber

of said cap, a signal element in operative connection with said bimetallic member whereby when said member is exposed to predetermined degrees of heat, said signal element will be moved into operative position, the coupling of said element with said member being such as to automatically return the signal element into inoperative position when the temperature in said chambers is lowered, said signal element involving a member slidably engaging said radiator cap and means for forming a seal around said sliding member, said bimetallic member constituting a strip-like body, means involving a tube inserted into the cap for supporting one end of the strip-like body, and the other end portion of said body being curved.

3. A signal device for radiator caps, said cap having a chamber opening into the chamber of the radiator and said device comprising a bimetallic member arranged in said chamber in a plane transversing the axis of said cap and actuated by the temperature conditions existing in the chamber of the radiator and extending into the chamber of said cap, a signal element in operative connection with said bimetallic member whereby when said member is exposed to predetermined degrees of heat, said signal element will be moved into operative position, the coupling of said element with said member being such as to automatically return the signal element into inoperative position when the temperature in said chambers is lowered, said signal element involving a member slidably engaging said radiator cap and means for forming a seal around said sliding member, said bimetallic member constituting a strip-like body, means involving a tube inserted into the cap for supporting one end of the strip-like body, the other end portion of said body being curved, and the sliding member of said element being supported on the last named end of said body.

4. A signal device for radiator caps, said cap having a chamber opening into the chamber of the radiator and said device comprising a bimetallic member arranged in said chamber in a plane transversing the axis of said cap and actuated by the temperature conditions existing in the chamber of the radiator and extending into the chamber of said cap, a signal element in operative connection with said bimetallic member whereby when said member is exposed to predetermined degrees of heat, said signal element will be moved into operative position, the coupling of said element with said member being such as to automatically return the signal element into inoperative position when the temperature in said chambers is lowered, said signal element involving a member slidably engaging said radiator cap and means for forming a seal around said sliding member, said bimetallic member constituting a strip-like body, means involving a tube inserted into the cap for supporting one end of the strip-like body and the other end portion of said body being curved, the sliding member of said element being supported on the last named end of said body, and said signal element involving members movably supported in connection with said sliding member.

5. The combination with a radiator cap of a signal device comprising a tube mounted to fit snugly in the bore of the cap, a bimetallic member in the form of a strip-like body, one end of which is secured to the wall of said tube and is arranged transversely of the axis of said tube, and a signal element supported in connection with the other end of said strip-like body and movable relatively to the upper wall of said radiator cap in the action of said bimetallic member.

6. The combination with a radiator cap of a signal device comprising a tube mounted to fit snugly in the bore of the cap, a bimetallic member in the form of a strip-like body, one end of which is secured to the wall of said tube and is arranged transversely of the axis of said tube, a signal element supported in connection with the other end of said strip-like body and movable relatively to the upper wall of said radiator cap in the action of said bimetallic member, and the last named end portion of said bimetallic member being curved.

7. The combination with a radiator cap of a signal device comprising a tube mounted to fit snugly in the bore of the cap, a bimetallic member in the form of a strip-like body, one end of which is secured to the wall of said tube and is arranged transversely of the axis of said tube, a signal element supported in connection with the other end of said strip-like body and movable relatively to the upper wall of said radiator cap in the action of said bimetallic member, the last named end portion of said bimetallic member being curved, and means for forming a seal between the signal element and the wall of said cap.

In testimony that I claim the foregoing as my invention I have signed my name this 28th day of November, 1927.

HARRY E. SIPE.