

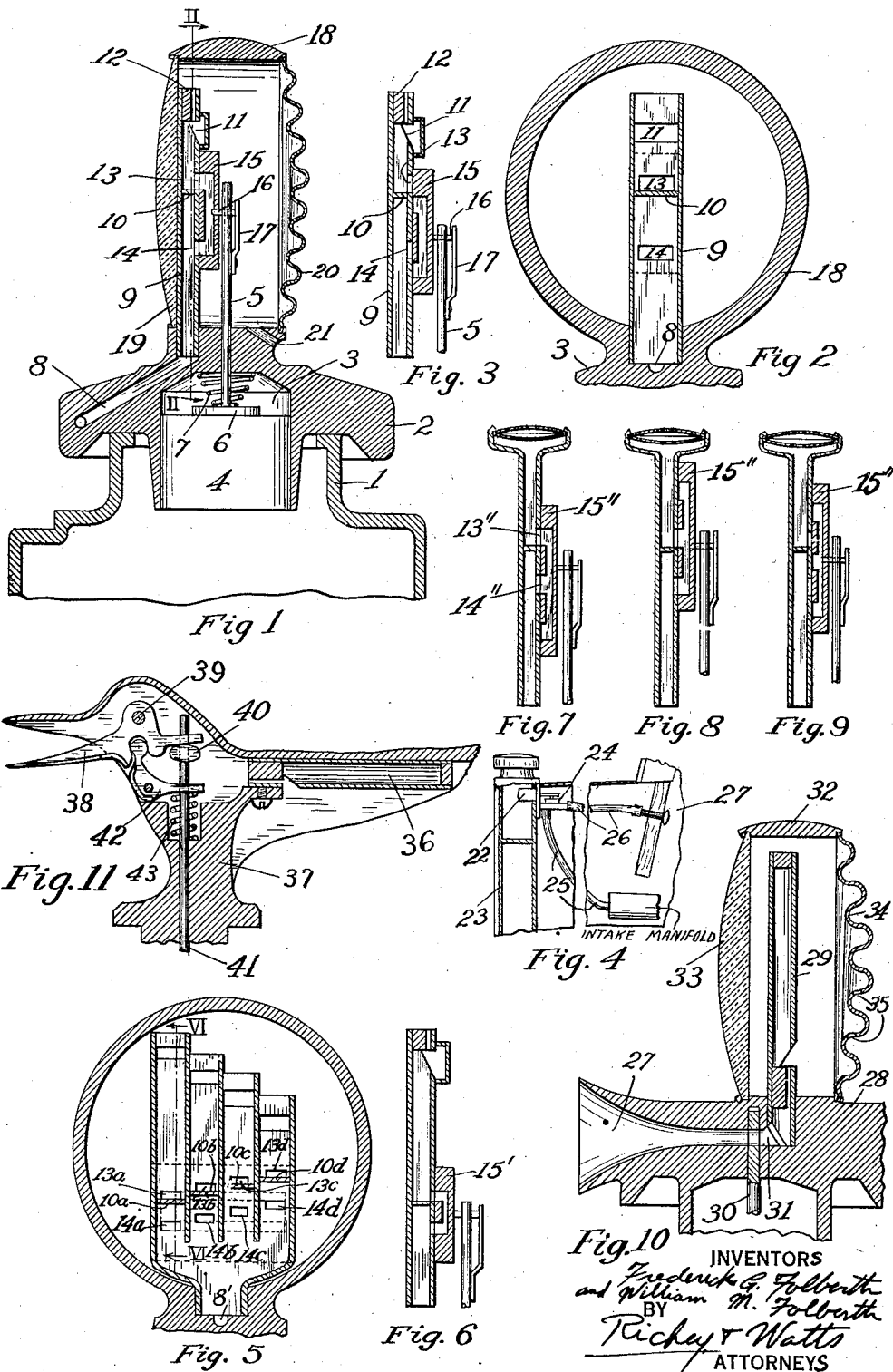
April 1, 1930.

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1,753,003

RADIATOR CAP

Filed July 5, 1927



UNITED STATES PATENT OFFICE

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RADIATOR CAP

Application filed July 5, 1927. Serial No. 203,414.

This invention relates to signalling devices and is particularly applicable to use in internal combustion motors and the like where it is desired to operate an audible signal upon the temperature of the motor reaching predetermined points.

An object of this invention is to provide a signal which will operate a whistle or similar device to produce a pleasing and characteristic sound when a predetermined temperature is obtained.

Other objects will hereinafter appear.

The invention will be better understood from the description of the practical embodiments thereof illustrated in the accompanying drawings in which

Figure 1 is a transverse sectional view of one embodiment of the invention;

Figure 2 is a fragmentary cross sectional view of parts shown in Figure 1 on line II—II thereof;

Figure 3 is a fragmentary longitudinal sectional view of the parts of Figure 1 in a different position;

Figure 4 is a longitudinal sectional view of parts of an automotive vehicle showing another embodiment of the invention;

Figure 5 is a transverse sectional view of still another embodiment of the invention;

Figure 6 is a longitudinal sectional view thereof taken on the line 6—6; and

Figures 7, 8 and 9 are fragmentary longitudinal views similar to Figures 3 and 6 but showing another embodiment and indicating the parts in the positions which they occupy at three different temperatures;

Figure 10 is a longitudinal sectional view similar to Figure 1 of another embodiment; and

Figure 11 is a longitudinal sectional view of another embodiment.

In Figures 1 to 3, one embodiment of the invention is illustrated in which a whistle is applied to the radiator cap of a motor vehicle. The filling spout of the radiator, shown at 1, is closed by a cap 2, hinged thereto and secured by a latch (hinge and latch not shown). In the lower surface of this cap and opening to the interior of the radiator is a recess 3 in which is mounted a thermally responsive de-

vice, illustrated as a capsule 4, which contains a fluid which expands or vaporizes at the temperature which is desired shall be indicated and so moves the top of the capsule upwardly. If desired the cap may be sealed below the capsule. This upward motion is transmitted to a rod 5, extending through the cap and provided at its lower end with a flange 6 bearing upon the upper head of the capsule and held in engagement therewith by spring 7 interposed between the flange and the upper end of the recess 3. Formed within the cap is a passage 8, the lower and outer end of which is connected to the intake manifold of the motor so that a partial vacuum is induced within the passage. The upper end of the passage communicates with the lower end of a tube 9 which extends upwardly from the cap. The tube is divided at an intermediate point by a partition or wall 10, and the part of the tube above the partition is notched at 11 and provided with a casing over the notch and at its upper end with an apertured plug 12, so that this part of the tube constitutes a whistle. Above and below the partition are two ports 13 and 14 respectively through the tube, and slidable upon the exterior in a position to either close both ports or to establish communication between them is a slide valve 15 connected to the rod 5 by a pin 16 which extends through an aperture in the rod and against the outer end of which a spring 17 bears so that the valve is resiliently held against the tube.

When the fluid in the radiator is cold, the upper head of capsule 4 is moved down and permits the rod 5 to be moved downwardly by the spring 7, sliding the valve into the position shown in Figure 3, in which the ports are covered and no air is drawn through the whistle. When, however, the temperature of the motor increases to the point where the fluid within the capsule expands, this expansion moves the upper head of the capsule, and with it the rod and valve, to the position shown in Figure 1 in which position the partial vacuum created in tube 8 draws air through the whistle, causing it to emit the sound which constitutes the signal.

The whistle and valve may be protected as

shown by a ring-like guard 18 formed integrally with or attached to the cap 2 and surrounding these parts. The front of the ring may be closed by a pane of glass 19 or the like, while the rear is preferably closed by a thin corrugated metallic cover 20 or the like which will readily transmit the sound vibrations emitted by the whistle. In the event that both the front and back of the chamber formed within the ring are closed, vents or perforations such as 21 are provided to permit air to be drawn within the chamber when the whistle is operated.

In Figure 4 is illustrated an embodiment of the invention in which the heat responsive device 22 is permanently mounted within the upper header of the vehicle radiator 23, and operates, in a manner similar to that of the embodiments of Figures 1 to 3, a valve 24 which controls the communication between two tubes 25 and 26. The tube 25 is connected to the intake manifold of the vehicle and the tube 26 is connected to a whistle 27 which may be conveniently mounted on the dash or in any other position, preferably near the operator. In this embodiment, as in that above described, when communication is established between tubes 25 and 26 the whistle emits a sound which apprises the operator that the predetermined temperature has been reached.

In Figures 5 and 6 is shown an embodiment of the invention similar to that of Figures 1 to 3 except that a plurality of whistles are provided instead of the single whistle illustrated above. As best shown in Figure 5, the partitions 10^a, 10^b, 10^c and 10^d are arranged each a trifle higher than the one preceding, as viewed from the left to right of the figures. The ports 13^a, 13^b, 13^c and 13^d are likewise arranged in an ascending series as are the ports 14^a, 14^b, 14^c, and 14^d. The valve 15' extends across the entire series of whistles and, as the temperature of the vehicle motor rises, it is moved gradually upward by the thermostatic device, establishing communication successively between ports of the whistle and the passage 8'. The whistles being of different length, are of different pitch so that the operator can tell by the note which is emitted approximately what the temperature of the motor is.

In Figures 7, 8, and 9 a whistle is illustrated which is provided with a valve 15'', similar to the valve previously described except that it is provided with three ports instead of two. As will readily be seen from these figures, when the motor is cold the valve will be at its lowermost position, as shown in Figure 7 and the upper two ports of the valve will register with ports 13'' and 14'' so that the whistle will emit its signal. By the time the temperature rises to that at which it is advantageous to operate the motor, the valve has been moved upwardly by the ther-

mostatic device to the position shown in Figure 9, where the ports are closed and the signal ceases. If the temperature continues to rise above that at which it is desired to operate the vehicle, the valve is moved still further upward as illustrated in Figure 8 and the lower two ports of the valve again register with the ports 13'' and 14'' of the tube, causing the device to again whistle and indicate that an undesirable condition exists in the motor.

In Figure 10, a radiator cap is illustrated in which an air scoop 27 is formed on the forward part of the marginal flange of cap 28, so that the air currents produced by the motion of the vehicle may be used to blow the whistle 29. In this embodiment, a valve 30 may be moved by a thermostatic device (not shown) to obstruct or clear a passage 31 between the scoop and whistle. In this embodiment the whistle is protected by a ring 32, front lens 33, and a flexible rear diaphragm 34, as above described, the diaphragm being perforated as at 35 to emit air blowing through the whistle.

In Figure 11, the whistle 36 is enclosed in an ornamental figure 37, shown in the shape of a bird, and the valve which controls the admission of air is formed to simulate the lower jaw or bill of the figure. This consists of a pivoted vane or flap 38, mounted on a pin 39, and adapted, when in lowered or open position, to form with the stationary part above it, a scoop for directing air to the whistle. This valve flap may be directly actuated by an enlargement 40 on a rod 41 actuated by a thermostatic device (not shown) when a high temperature is reached and may be indirectly actuated by the same enlargement through a bell crank 42 when a low temperature is reached, the valve being held closed by a spring 43 between these two predetermined temperatures.

While we have described the illustrated embodiments of our invention in some particularity, obviously many variations and modifications thereof will readily occur to those skilled in the art to which this appertains, and we, therefore, do not limit ourselves to the precise details shown and described, but claim as our invention all embodiments thereof coming within the scope of the appended claims.

We claim:

1. In combination with an internal combustion motor, a thermostat actuated by the temperature of the cooling fluid thereof, a valve moved by said thermostat, and a sound responsive device actuable by the passage of atmospheric air and controlled by said valve.
2. In combination with an internal combustion motor, a thermostatic device associated with the cooling system thereof, a valve controlled by said thermostatic device, a source of difference in fluid pressure caused

by suction in the intake manifold of said motor connected to said valve, and a whistle operated by said source when the valve is open.

5 3. A signal for use with internal combustion motors which comprises a thermostatic device exposed to the cooling fluid in the motor, a valve actuated by said thermostatic device, two connections to the valve, one communicating with a whistle and the other communicating with a source of difference of fluid pressure connected with the air supply to said motor for actuating said whistle.

10 4. A signal comprising a thermostatic device exposed to the cooling fluid of an internal combustion motor, a conduit connected to the intake manifold of the motor and to a whistle, and a valve controlling the passage of air through said conduit and operated by
15 said thermostatic device.

5 5. A signal comprising a thermostatic device exposed to the cooling fluid of an internal combustion motor, a valve actuated thereby, said valve being provided with a plurality of openings arranged to establish communication between two stationary ports when the cooling fluid is below one predetermined temperature or above another predetermined temperature, a whistle connected with one of
20 said ports and a source of difference of fluid pressure connected with the other of said ports.

6. In a combination with an internal combustion motor, a thermostatic device associated with the cooling system thereof, a valve controlled by said thermostatic device, a source of air current controlled by said valve, and a whistle operated by said air current when the valve is open.

40 In testimony whereof we hereunto affix our signatures this 30th day of June, 1927.

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