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W. S. HOSMER
RADIATOR SAFETY VALVE
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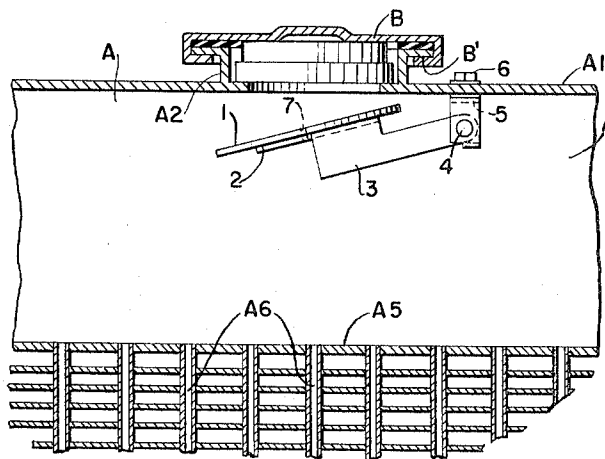


FIG. 1.

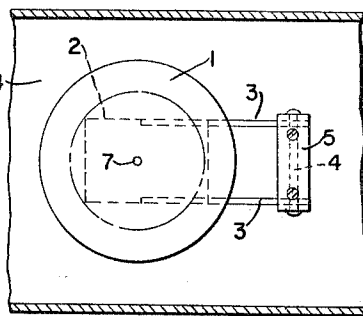


FIG. 3.

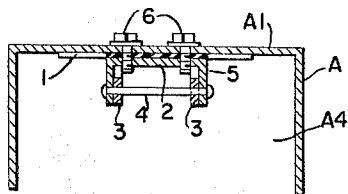


FIG. 4.

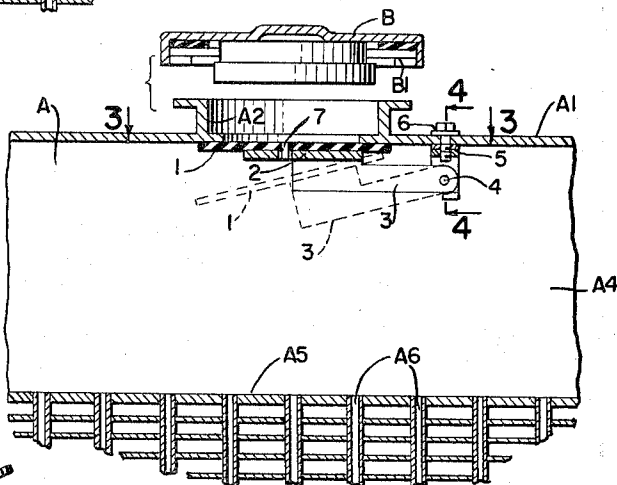


FIG. 2.

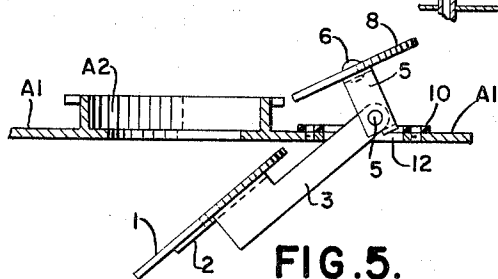


FIG. 5.

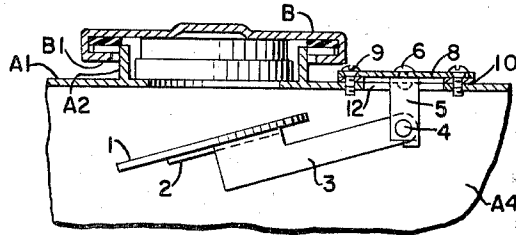


FIG. 6.

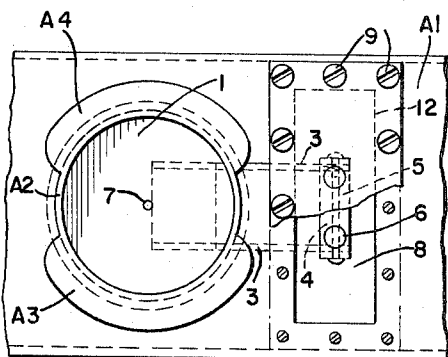


FIG. 7.

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This invention relates to automobile radiators and the like, and more particularly to novel radiatory safety valves for radiators, of the type commonly used in the automotive field, having radiator tanks equipped with filling necks normally closed by removable radiator caps, which tanks communicate with the customary radiator cores. Ordinarily, engine coolant systems employ considerable operating pressures which may vary from 7.5 to 18 pounds, and difficulties have arisen with respect to inspection of the liquid level in the radiator, and when adding liquid or coolant thereto, which operations necessitate removal of the radiator cap from the filling necks, resulting when the radiator cap is removed in loss of hot or boiling coolant under pressure from the filling neck, and resulting in possible injury to the attendant or person concerned and damage to the car finish. Often during removal of the radiator cap, without warning, the liquid or coolant will blow off, allowing boiling water and coolant and steam to escape, and often the attendant is dangerously scalded or painfully burned while removing the radiator cap.

The principal object of my invention is to provide an upwardly acting radiator safety valve within the radiator adjacent and below the filling neck which will permit the radiator cap to be removed without danger of wasting expensive coolant and antifreeze solutions, and at the same time protecting the attendant from boiling liquid or coolant. The radiator cap would ordinarily be removed in the regular manner, while the safety valve would come into action in case of mechanical failure of the radiator cap, or in case of negligence in removal of the cap B.

Another object of the invention is to provide a radiator safety valve particularly adaptable to the radiators of automobiles, trucks, tractors, stationary engines, draglines, bulldozers, grading machines, high-lifts, or other automotive machinery or vehicles.

I will explain the invention with reference to the accompanying drawing, which illustrates several practical practical embodiments thereof, to enable others familiar with the art to adopt and use the same; and will summarize in the claims the novel features of construction and novel combinations of parts, for which protection is desired.

In said drawing:

FIG. 1 is a vertical sectional view through a radiator showing the filling neck and radiator cap, also showing the radiator core, and showing one embodiment of my novel safety valve associated with the filling neck, the valve being shown in normal open position.

FIG. 2 is a view similar to FIG. 1 but showing the radiator cap removed from the filling neck, and showing the safety valve in closed position.

FIG. 3 is a horizontal section on the line 3-3, FIG. 2.

FIG. 4 is a vertical section on the line 4-4, FIG. 2.

FIG. 5 is a vertical section showing the installation of a modified safety valve.

FIG. 6 is a vertical section showing the modified valve of FIG. 5 mounted on the radiator.

FIG. 7 is a top plan view of the assembly of the modified safety valve of FIG. 5 in the radiator.

As shown in FIGS. 1 to 4, the radiator A of the automobile, tractor, bulldozer or the like is provided with a top plate A' having a filling neck A2, the top of the

filling neck A2 having a conventional cammed flange A3, FIG. 7, and the filling neck A2 communicating with the liquid compartment A4 having a horizontal bottom wall A5 which communicates with the radiator core A6 in the customary manner. A removable radiator cap B normally closes the filling neck A2, the cap having inwardly directing tongues B' for registering with the flange A3 of the filling neck A2 in the customary manner, so that the cap B may be securely locked on the neck A2 or readily removed therefrom by a slight twist of the cap B. The particular forms of the filling neck A2 and the cap B form no part of my present invention.

As shown, I provide a safety valve preferably comprising a rubber disk 1 of diameter somewhat larger than the diameter of the filling neck A2 so as when in operative position the disk 1 will seat on the underside of the tank top A' as shown in FIG. 2 and close the filling neck A2 when the cap B is removed, the rubber disk being actuated by pressure within the radiator chamber A4. The rubber safety valve 1 is mounted upon a metal disk 2 disposed axially of the valve disk 1, the disk 2 being mounted upon parallel arms 3 extending laterally of the disk 1 and neck A2 as shown, and having its outer end journaled as at 4 in a bracket 5 disposed within the chamber A4 and secured to the underside of the top plate A' of the radiator by bolts 6 or the like, whereby the safety valve disk 1 may drop by gravity within the chamber A4 to uncover the lower end of the neck A2, as shown in FIG. 1, when the cap B is positioned on the filling neck A2; but when the cap B is removed the pressure of the coolant or liquid within the radiator chamber A4, which may vary from 7.5 to 18 pounds will swing the arms 3 upwardly and thereby position the safety valve disk 1 across the opening of the filling neck A2, as shown in full lines in FIG. 2, and thereby prevent the internal pressure within the radiator from blowing the hot or boiling coolant or steam out through the filling opening A2 which might scald or painfully burn the attendant while or after removing the cap B due to the escape of boiling liquid or steam. Adjacent the center of the valve 1 and plate 2 is a bleed hole 7 to reduce the pressure within the radiator chamber A4 when the cap B is removed.

Thus I have provided in FIGS. 1-4 a radiator safety valve 1-6 which does not interfere with the normal operation of the radiator cap B and in which the safety valve only comes into operation when the cap B is removed from the filling neck A2, the pressure of the coolant within the radiator chamber A4 closing the valve 1 when the cap B is removed, and the bleed hole 7 serving to then release the pressure within the radiator chamber A4, the valve opening to normal position gravitationally when the pressure thereon is reduced to substantially zero.

FIGS. 1-4 show an embodiment in which the installation of the valve and bracket 1-5 may be made by insertion through the usual upper water-hose inlet of the radiator (not shown). However, if the inlet is not large enough to permit passage of the valve 1-6 the same may be inserted, as shown in FIG. 5, through a rectangular slot 12 in the upper wall A' of the radiator adjacent the filling neck A2, the length of slot 12 being greater than the diameter of disk 1. In this case the bracket 5 instead of being mounted directly by screws 6 on the underside of the radiator top wall A' would be mounted upon the bottom of a rectangular plate 8 positioned on the top of wall A' by means of screws 9 which pass through the margin of the plate 8 and through a sealing gasket 10 and into tapped bores in the top plate A' around the slot 12, whereby the slot 12 will be efficiently sealed by plate 8 when the screws 9 are thus secured to the top wall A'. The operation of the safety valve shown in FIGS. 5-7 however is the same as that

described in connection with the valve shown in FIGS. 1-4.

Thus I have provided a novel radiator safety valve which will protect the attendant from being dangerously scalded or painfully burned while removing the radiator cap B, which radiators in present-day cars may carry an operating pressure varying from about 7.5 to 18 pounds. Sometimes during removal of cap B, with no warning, the cap will blow off allowing boiling water and steam to escape. Thus my valve will save expensive coolants and antifreeze solutions from being wasted. The radiator cap B would ordinarily be removed in the regular manner. However, my safety valve will take over in case of mechanical failure of the radiator cap B, or when negligence due to improper removal of the cap B has come into play.

I do not limit my invention to the exact forms shown in the drawing, for obviously changes may be made therein within the scope of the claims.

I claim:

1. In combination with an automotive vehicle having a radiator casing containing engine coolant under pressure, said radiator casing having a top plate provided with a filling neck carrying a readily removable radiator cap; a safety valve comprising a rubber disk of larger diameter than the filling neck disposed below and axially of the neck within the casing; a member within the casing supporting said rubber disk; an arm on said member extending laterally of said neck; and means in said casing for pivotally supporting the outer end of the arm to permit movement of the rubber disk by pressure within the casing into position to close the filling neck when the radiator cap is removed, and to permit gravital movement of the disk into position to open said neck when the radiator cap is positioned on the filling neck.

2. In a combination as set forth in claim 1, said supporting means comprising a bracket secured within the casing to the underside of the top plate adjacent said neck; and a pivot pin transfixing the outer end of the arm and said bracket.

3. In a combination as set forth in claim 1, said casing having an opening therein adjacent the neck of length greater than the diameter of the valve; a cover plate removably secured to the upper face of said top plate over said slot; sealing means interposed between

the cover plate and top plate; and said supporting means comprising a bracket within the casing secured to the underside of said cover plate; and a pivot pin transfixing the outer end of the arm and said bracket.

4. In combination with an automotive vehicle having a radiator casing containing engine coolant under pressure, said radiator casing having a top plate provided with a filling neck carrying a readily removable radiator cap; a safety valve comprising a rubber disk of larger diameter than the filling neck disposed below and axially of the neck within the casing; a member within the casing supporting said rubber disk; an arm on said member extending laterally of said neck; means in said casing for pivotally supporting the outer end of the arm to permit movement of the rubber disk by pressure within the casing into position to close the filling neck when the radiator cap is removed, and to permit gravital movement of the disk into position to open said neck when the radiator cap is positioned on the filling neck; and a bleed hole extending through said valve and member to relieve the pressure within the radiator casing when the cap is removed.

5. In a combination as set forth in claim 4, said supporting means comprising a bracket secured within the casing to the underside of the top plate adjacent said neck; and a pivot pin transfixing the outer end of the arm and said bracket.

6. In a combination as set forth in claim 4, said casing having an opening therein adjacent the neck of length greater than the diameter of the valve; a cover plate removably secured to the upper face of said top plate over said slot; a gasket interposed between the cover plate and top plate; and said supporting means comprising a bracket within the casing secured to the underside of said cover plate; and a pivot pin transfixing the outer end of the arm and said bracket.

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