J. N. VAN METER.

THERMOSTATIC SAFETY VALVE.

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1,268,648.

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Fig. 1.

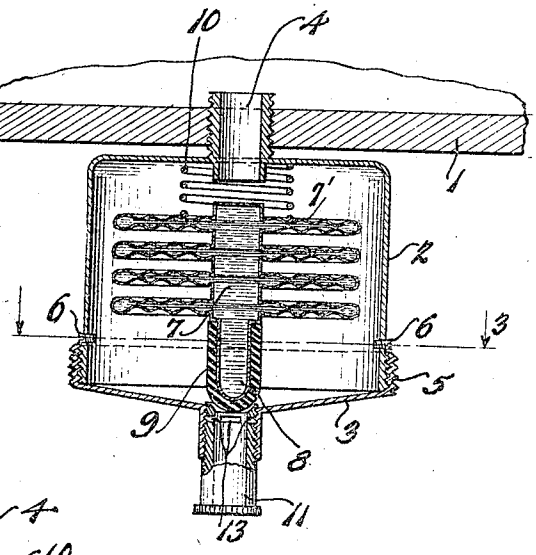


Fig. 2.

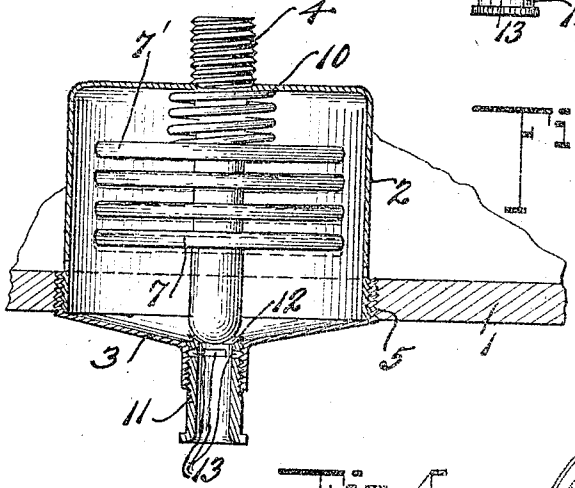


Fig. 3.

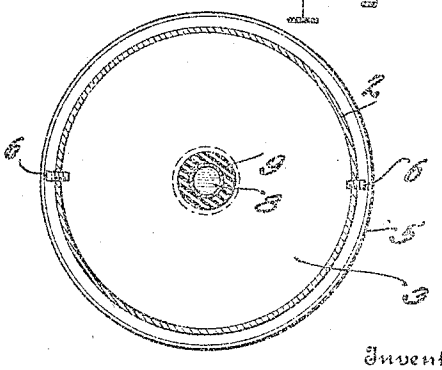
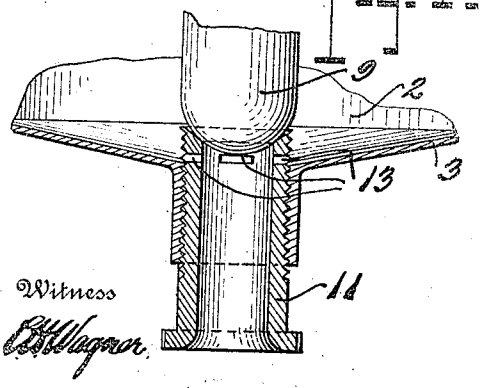


Fig. 4.



Witness

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THERMOSTATIC SAFETY-VALVE.

1,268,648. Specification of Letters Patent. Patented June 4, 1918.

Application filed June 26, 1917. Serial No. 177,047.

To all whom it may concern:

Be it known that I, JOHN N. VAN METER, a citizen of the United States, residing at Norton, in the county of Norton and State of Kansas, have invented certain new and useful Improvements in Thermostatic Safety-Valves, of which the following is a specification.

The present invention constitutes improvements in thermostatic safety valves, as especially designed for coöperation with the water system of a motor vehicle, in connection with which it forms an attachment for the radiator.

The object of the invention is to provide automatically operable means for draining the system when the temperature falls below a predetermined degree such that there is likelihood of the fluid freezing, accompanied by the usual disastrous results experienced by operators of vehicles of this character.

A further object is to provide a device of this type with an expansion member which normally maintains the drain outlet closed, the said outlet comprising an operable member embodying a valve seat, which member is adjustable to actuate the expansion member whereby to render the same inoperative for the purpose of preventing drain of the water system, whenever desired.

These and such other objects as may hereinafter appear are attained by the novel construction, combination and arrangement of parts to be hereinafter specifically described and claimed. Reference will now be had to the accompanying drawing forming a part of this specification, wherein:

Figure 1 is a vertical sectional view through an embodiment of this invention;

Fig. 2 is a similar sectional view, the expansion member, however, being shown in elevation;

Fig. 3 is a horizontal sectional view on the line 3—3 of Fig. 1; and

Fig. 4 is an enlarged sectional view of the lower portion of the device, showing the draining means in operated position, rendering the expansion member inoperative.

Throughout the following detail description, and on the several figures of the drawing, similar parts are referred to by like reference characters.

Referring to the drawing, 1 designates the receptacle containing the fluid, such as a radiator, when the invention is used in conjunction with a cooling system of a motor vehicle, and to this the device is attached at a conveniently accessible position. In its construction, the device consists of a casing 2 of any desired size and configuration, provided at its top, and centrally thereof, with an attaching nipple, threaded for connection in an opening of the radiator. At its bottom the casing has a closure cap 3, the peripheral portion of which is both internally as well as externally threaded for purposes now to be described.

As will be observed by reference to Fig. 1, the valve device is connected to the radiator by the nipple above referred to and designated 4, so that the body thereof is exteriorly positioned with reference to the radiator. Where, desired, however, the device may be arranged with its body interior of the radiator, as shown in Fig. 2, a larger opening in the radiator being provided for this purpose. Thus the exterior threading of the closure cap 3, as indicated at 5, is required. When in the position shown in Fig. 2, certain removable plugs 6 are displaced so as to permit of the entrance of the fluid into the lower part of the casing as well as through the upper nipple 4, to render the draining more effective.

Mounted wholly within the casing 2 is an expansion member 7, which consists of a series of hollow disks 7′, each disk being in communication with the other, and containing some volatile fluid, such as ether, mercury, or the like, very sensitive to changes in temperature. The walls of these disks, as will be observed in Fig. 1, are preferably corrugated so as to permit of ready flexing of material under the expansive and contracting actions of the member 7. The lower portion of the expansion member is provided with a depending projection 8, preferably faced with rubber, as indicated at 9, and this element constitutes a valve, subject to be seated and unseated by the expanding and contraction of the member 7. This member last mentioned is supported within the casing 2 by a coiled spring 10 and this mounting permits movement of the expansion member regardless of whether it is expanded or contracted, for purposes hereinafter to be set forth.

Screwed into a central opening in the cap

3, is a draining member 11 which is designed to be adjusted upwardly or downwardly at will for adjustment of the seat 12 at its upper end with respect to the cap 3 in order to render the seating ineffective to prevent drainage of this device. The adjustment of this member possesses further utility for by movement of the draining member 11 upwardly, the expansion member 7 may be actuated against its spring tension whereby to lift the said member 7 and render it inoperative so that the system may be drained at will. To this end, the draining member 11 is provided with certain auxiliary openings 13 which in the normal position of this member are closed by the wall of the cap but which will be raised upon movement of the draining member to such position as will allow the fluid to pass outwardly when the discharge port is closed by the valve as the latter is rendered inoperative.

It will be apparent from the foregoing that when the temperature of the water or other fluid in the system falls to a danger point so that freezing is likely to follow, the expansion member will be sufficiently contracted to withdraw its valve member off the valve seat 12, whereupon the water will be drained, this action being automatic, obviously. It is to be understood, of course, that normally the valve is seated, and the higher the temperature of the fluid the greater the pressure of the valve against the seat, excessive pressure being relieved by the yielding of the spring 10.

Whenever it is desired to drain the system, the operator screws the member 11 inwardly, or upwardly until its auxiliary outlets are exposed within the casing.

While I have described this invention as applicable particularly to the radiators of vehicles, I do not wish to be confined to any such special use and it will be apparent also that slight changes may be made in the details of construction of the parts without departing from the spirit of the invention and within the scope of the appended claims.

Having thus described my invention, what is claimed as new is:—

1. In a device of the class described, an expansion member adapted to be subjected to the temperature of the surrounding fluid, a discharge valve operable by said member and normally held in closed position thereby, and means separate from the valve and expansion member operable at will to shift said valve to effect drainage of the fluid.

2. In a device of the class described, an expansion member adapted to be subjected to the temperature of surrounding fluid, a valve member operable by said expansion member and normally held in closed position thereby, and means operable at will to shift said valve to effect drainage of the fluid, said last mentioned means embodying a valve seat for said valve.

3. In a device of the class described, an expansion member adapted to be subjected to the temperature of surrounding fluid, a valve member supported by said expansion member and operable thereby to seat and unseat the valve according to the temperature, and means constituting a discharge port movable to displace the expansion member for rendering said expansion member inoperative, whereby to effect drainage of the fluid at will.

4. In a device of the class described, an expansion member adapted to be subjected to the temperature of surrounding fluid, a discharge valve operable by said member and normally held in closed position thereby, and drainage means through which the fluid is discharged operable to render the expansion member inoperative at will, whereby to effect drainage of the fluid.

5. In a device of the class described, an expansion member adapted to be subjected to the temperature of surrounding fluid, a discharge valve operable by said member and normally held in closed position thereby, and drainage means having a seat for said valve constituting a discharge port, said means being movable when the valve covers said port to effect drainage independently of the port aforesaid.

6. In a device of the class described, an expansion member adapted to be subjected to the temperature of surrounding fluid, and drainage means for said fluid automatically controlled by said member, said drainage means being adjustable to render the automatic control inoperative to permit drainage of the fluid at will.

7. In a device of the class described, an expansion member adapted to be subjected to the temperature of surrounding fluid, manually operable drainage means including a discharge port normally maintained closed by the expansion member, and a yieldable mounting for said expansion member whereby to permit the latter to yield upon operation of the drainage means to render the expansion member inoperative and simultaneously effect drainage of the fluid.

8. In a device of the class described, the combination with a water system, of a thermostatic safety valve therefor comprising a casing provided with attaching means and an inlet for the fluid, a draining member for said casing provided with a valve seat, an expansion device disposed in said casing and subjected to the temperature of the contents thereof, said device having a valve controlling the discharge of the contents through said draining member, said draining member having an auxiliary discharge outlet normally closed when the expansion

member is operable, said auxiliary discharge being rendered operative whe the expansion member is rendered inoperative.

9. In a device of the class described, the combination with a water system, of a thermostatic safety valve therefor comprising a casing provided with attaching means and an inlet for the fluid, a draining member adjustably connected to the casing, an expansion member mounted within the casing and automatically operable to close the mouth of said draining member, said draining member having an auxiliary opening normally closed by the casing when the expansion member is operative, the draining member being manually operable to render the expansion member inoperative and simultaneously open the auxiliary opening aforesaid for draining the system at will.

10. A radiator attachment comprising a casing having an inlet to admit the contents of the radiator thereinto, a closure at one side of said casing having a discharge outlet, an expansion member mounted within the casing and having a valve coöperative with the discharge outlet, and a yieldable support for said expansion member.

11. A radiator attachment comprising a casing, a closure cap, a drain nipple connected to the cap, and a valve member within the casing for controlling the discharge through said nipple normally, the drainage being effected at will by the manual operation of the drain nipple aforesaid.

12. A radiator attachment comprising a casing, an expansion member disposed within the casing, a spring support for said member, a valve member carried by the expansion member, a covering for said valve member, and an adjustable draining member with which said valve member coöperates.

In testimony whereof I affix my signature.

JOHN N. VAN METER.