Aug. 25, 1942. D. J. MUNSON 2,293,913

ENGINE COOLING SYSTEM CONTROL

Filed April 24, 1941

Fig. 1.

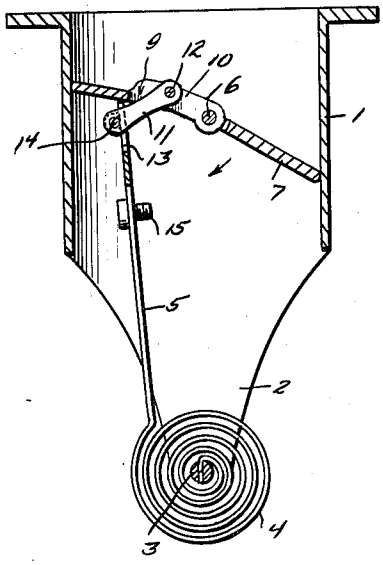



Fig. 3.




Fig. 4.

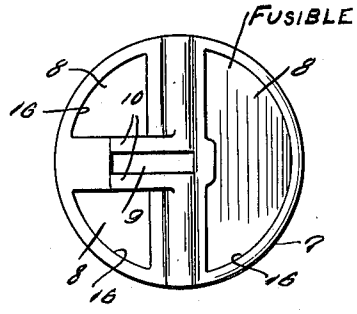



Fig. 2.

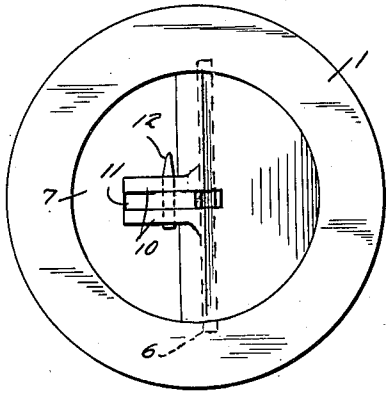
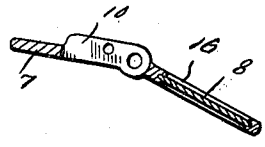



Fig. 5.




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# UNITED STATES PATENT OFFICE

2,293,913

## ENGINE COOLING SYSTEM CONTROL

Donald J. Munson, Anderson, Ind.

Application April 24, 1941, Serial No. 390,159

1 Claim. (Cl. 236—34)

The present invention relates to new and useful improvements in automatic engine cooling system controls of the type comprising a thermally operated valve interposed in the cooling system and responsive to variations in the temperature of the water for controlling or regulating the circulation thereof.

The primary object of the invention is to provide, in a manner as hereinafter set forth, a control of the aforementioned character which embodies novel means whereby the device will be automatically rendered inoperative and permit the water to circulate freely therethrough in the event that the valve should fail to open and the water rise to a predetermined temperature.

Other objects of the invention are to provide an engine cooling system control of the character described which will be comparatively simple in construction, strong, durable, highly efficient and reliable in use, compact and which may be manufactured and installed at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawing wherein like characters of reference designate corresponding parts throughout the several views, and wherein:

Figure 1 is a view in vertical section through an automatic control device constructed in accordance with the present invention.

Figure 2 is a top plan view thereof.

Figure 3 is a detail view in perspective of one of the pins.

Figure 4 is a top plan view of another embodiment of the invention.

Figure 5 is a sectional view through the modification.

Referring now to the drawing in detail, it will be seen that the invention comprises a connection 1 in the form of a flanged tube of suitable material which is adapted to be interposed in the cooling system of an internal combustion engine between the upper hose and the radiator. Extending from one end of the tube 1 are integral arms 2 between the free end portions of which a stationary rod 3 extends. A coiled thermal element 4 encircles the rod 3 and has one end portion fixed thereto. At its other end, the thermal element 4 terminates in an arm 5 which extends upwardly into the tube 1.

Traversing the tube 1 at an intermediate point is a shaft 6 having mounted thereon a butterfly valve 7. Of course, the valve 7 controls the flow of water through the tube 1. The valve 7 includes a slot 9 extending at right angles to the shaft 6, integral apertured ears 10 being provided on the opposite sides of said slot. The slot 9 accommodates a link 11 having one end pivotally and releasably connected to the ears 10 through the medium of a fusible pin 12 of metal having a low melting point. The valve 7 is overbalanced to provide for opening thereof under pressure of the water against one side thereof, when released from the pin 12, and preferably by offsetting the shaft 6 from the transverse center of the valve as shown in Figure 1 to provide a greater valve area on one side of said shaft 6, or pivotal axis, than on the other side of said shaft. The melting point of the fusible pin 12 is low enough to provide for fusing or shearing of the same, and hence release of the valve 7 from the thermal element 4, when the temperature of the water rises above a safe point, for example, above 200 degrees.

The free end portion of the arm 5 of the thermal element 4 has formed therein a slot 13 for the passage of the other end portion of the link 11 which is connected to said arm by a pin 14. Thus, the valve 7 is connected to the element 4 for actuation thereby. An adjustable stop screw 15 is threadedly mounted in the arm 5 of the thermal element 4 for limiting the opening movement of the valve 7.

It is thought that the operation of the device will be readily apparent from a consideration of the foregoing. Briefly, the valve 7 is opened and closed by the thermal element 4 as said element, responding to variations in the temperature of the water, expands and contracts. Should the valve fail to open for any reason and the water rise to a predeterminned temperature the fusible pin 12 will melt thereby automatically disconnecting said valve from the thermal element 4 for permitting said valve to open under the pressure of the water.

In the modification illustrated in Figures 4 and 5 of the drawing, the valve 7 has formed therein a plurality of openings or passages 16 which are closed by fusible inserts 8. Thus, should the valve 7 of this embodiment fail to open and should the water rise to a predetermined temperature, the inserts 8 will melt and permit said water to flow through the openings or passages 16.

It is believed the many advantages of an engine cooling system control constructed in accordance with the present invention will be readily understood and although preferred embodiments of the device are as illustrated and described, it is to be understood that further modifications and changes in the details of construction may be re-

sorted to which will fall within the scope of the invention as claimed.

What is claimed is:

An engine cooling system control comprising a conduit, arms extending from one end of said conduit, a stationary rod extending between said arms, a coiled thermal element encircling said rod and having one end portion fixed thereto, said thermal element including an arm on its other end extending into the conduit, the free end portion of the second named arm having a slot therein, a link passing through the slot and having one end pivotally connected to the second named arm, a butterfly valve operable in the conduit and having a slot therein for the reception of the link, and a pin operatively connecting the link to the valve for the actuating said valve, said pin being formed of fusible metal having a melting point sufficiently low to provide for fusing, or shearing, thereof, when the temperature of the water rises to a dangerous point so that said valve is released from the link and thermal element for opening by the pressure of water against the same.

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