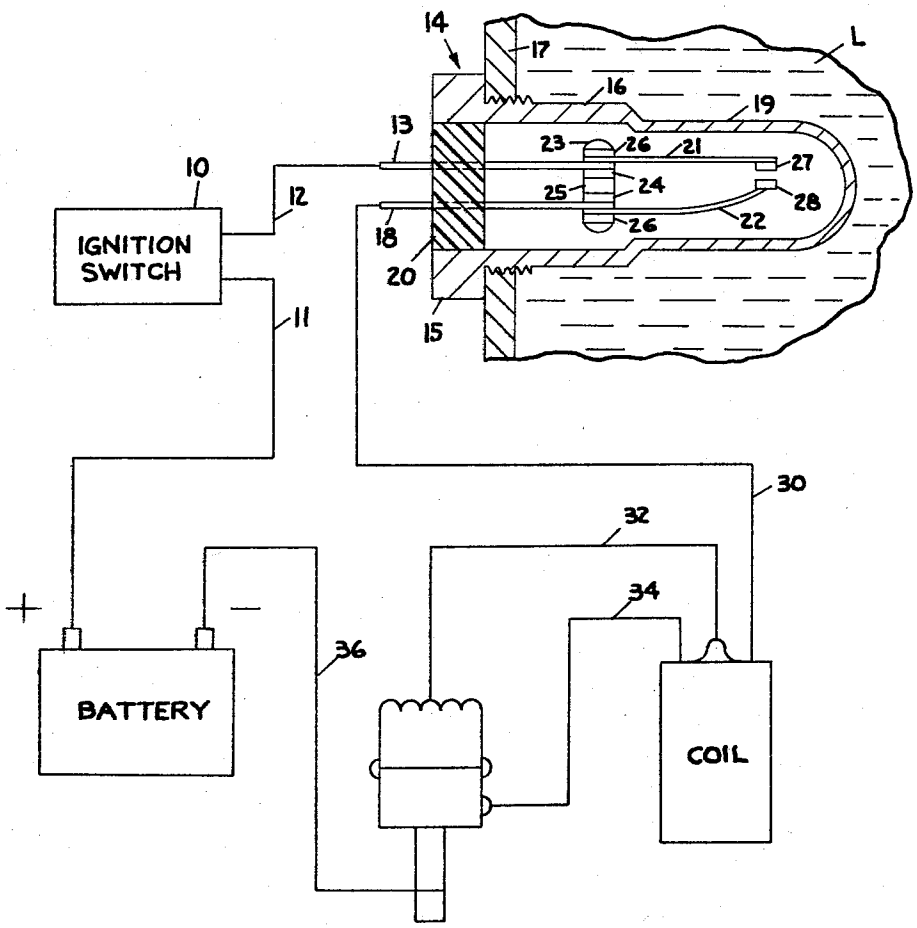
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THERMOSTATIC IGNITION SWITCH

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THERMOSTATIC IGNITION SWITCH

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This invention relates to a safety switch for an internal combustion engine with a water cooling system, and particularly, for an automotive engine.

While automotive vehicles are provided with temperature gauges, it not infrequently happens that the driver ignores or does not notice the gauge, and the vehicle overheats, so that the engine is damaged.

Moreover, when the cooling system contains certain types of antifreeze, the antifreeze simply boils off at a constant temperature and it may not cool the engine effectively in so doing. When it is all gone or nearly all gone, a critical situation will arise rapidly for which the operator may be completely unprepared.

One object of the present invention is to provide a safety switch that will prevent damage to engines caused by overheating, whether the overheating is noticed by the operator or not.

Another object of the invention is to provide a safety switch that will eliminate the factor of human judgment in determining whether an engine is overheated.

Another object of the invention is to provide a safety switch that can be adjusted to stop a liquid-cooled engine at any predetermined temperature of the cooling liquid.

Another object of the invention is to provide a safety switch for a liquid-cooled internal combustion engine that will prevent the engine from being operated at any temperature of the cooling liquid above a predetermined temperature, regardless of the judgment of the operator.

Other objects of the invention will be apparent hereinafter from the specification and from the recital of the appended claims.

The drawing is a schematic diagram showing a safety switch for the internal combustion engine of an automotive vehicle, connected in the ignition switch circuit, according to one embodiment of this invention, and shown in its open position in which the engine is stopped.

Referring to the drawing, **10** denotes an ignition switch of conventional type for an automotive vehicle engine. One electrical lead **11** from the ignition switch is connected to the battery and the other electrical lead **12** is connected to one terminal **13** of a thermostatic switch **14**. The switch **14** is mounted to measure the temperature of the liquid L in the cooling system of the vehicle.

The switch **14** comprises an elongate housing **15** that is generally cup-shaped and that is formed with a first reduced, threaded extension **16** that can be threaded into a threaded recess in a wall **17** of the radiator or engine block or other part of the cooling system of the vehicle. The housing **15** is also formed with a second extension **19** of even further reduced diameter, that extends further into the cooling liquid L in the cooling system.

The terminals **13** and **18** respectively of the switch are mounted, in spaced relation, in a plug **20** of insulating material that is lodged in the bore of the housing **14** at its outer end. The plug **20** seals the housing **14** to form a closed chamber within the housing, within which the switch elements are mounted. The switch elements comprise a rigid metallic member **21**, and a bimetallic, heat-

sensitive element **22**, that are secured together and respectively to the two terminals **13**, **18** of the switch by an insulated rivet **23**. The two terminals **13**, **18** are electrically insulated by insulating washers **24** that are disposed respectively at opposite sides of a metal spacer **25**. The elements **21**, **22** are electrically insulated from the rivet **23** by insulating washers **26**. Contacts **27**, **28** are mounted in confronting relation between the opposed tips at the free ends of the two elements **21**, **22** respectively. The housing **15** is preferably made of a highly heat conductive metal, and its reduced second extension **19** closely surrounds the two elements **21**, **22**, so that the bimetallic element **22** responds quickly to temperature changes of the cooling liquid L.

The terminal **18** of the switch is connected through a line **30** with the distributor coil of the automobile, and the coil is connected through the conventional pair of lines **32**, **34**, with the distributor. The battery is grounded by line **36** to the distributor.

The thermostat elements **21**, **22** respectively are set to be normally in contact, or closed, at temperatures below some preselected temperature, such as, for example, 200° F., and spaced apart, as shown, at and above this temperature. When the heat exchange liquid L attains a temperature of 200° F. or higher, the bimetallic element **22** moves to separate the contact points **27**, **28**, and to break the circuit from the ignition switch to the coil. The effect is the same as though the ignition switch had been turned off; the engine is stopped, and will not start again until the engine and the cooling liquid L have cooled sufficiently below 200° F. to permit the contact points **27**, **28**, to make contact again.

This device eliminates the factor of human judgment as to whether an engine is overheated, since it automatically stops the engine at and above some preselected temperature. Furthermore, the device operates to stop the engine when the cooling liquid L is overheated for any reason, such as, for example, when an insufficient quantity of cooling liquid is in the cooling system to effect proper heat exchange. Preferably, a standard type of thermostat switch is employed that can be adjusted readily to any safe, preselected temperature.

While the invention has been described in connection with a specific embodiment thereof, it will be understood that it is capable of further modification, and this application is intended to cover any variations, uses, or adaptations of the invention following, in general, the principles of the invention and including such departures from the present disclosure as come within known or customary practice in the art to which the invention pertains and as may be applied to the essential features hereinbefore set forth, and as fall within the scope of the invention or the limits of the appended claims.

Having thus described my invention what I claim is:

1. A safety control for an engine that has a circulating fluid cooling system and an electric ignition system circuit, said ignition system circuit including a source of electrical potential, an ignition switch, and a distributor arranged in series said control comprising a heat sensitive switch that is electrically connected in said ignition system circuit in series with said ignition switch and that is mounted to sense the temperature of the crculating fluid in said cooling system, said heat sensitive switch being normally closed at temperatures below a preselected temperature to permit completion of said ignition system circuit and to permit operation of said engine, and being adapted to open at temperatures at and above said preselected temperature to open said ignition system circuit and prevent operation of said engine.

2. A safety control for an automobile engine that has a circulating fluid cooling system and an electric ignition system circuit, said ignition system circuit including a

source of electrical potential, an ignition switch, and a distributor in series, said control comprising a fluid-tight housing that is mounted in direct contact with the fluid in said cooling system and to project into a circulation path of said fluid, said housing having a chamber therein, a pair of electrically conductive elements mounted in said chamber at least one of which is heat sensitive to sense the temperature of the fluid, each of said elements being secured in said housing at one of its ends, said elements having confronting tips at their respective free ends for electrical contact with each other, said elements being connected in said electric ignition system circuit in series with said ignition switch, said elements being adjusted so that

at temperatures of said fluid below a preselected temperature said tips are in electrical contact to permit completion of said ignition system circuit and to permit operation of said engine, and so that at temperatures at and above said preselected temperature said tips are not in electrical contact to open said ignition system circuit and prevent operation of said engine.

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