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L. P. BARLOW

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SAFETY FIXTURE FOR ENGINE CYLINDERS

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Fig. 1.

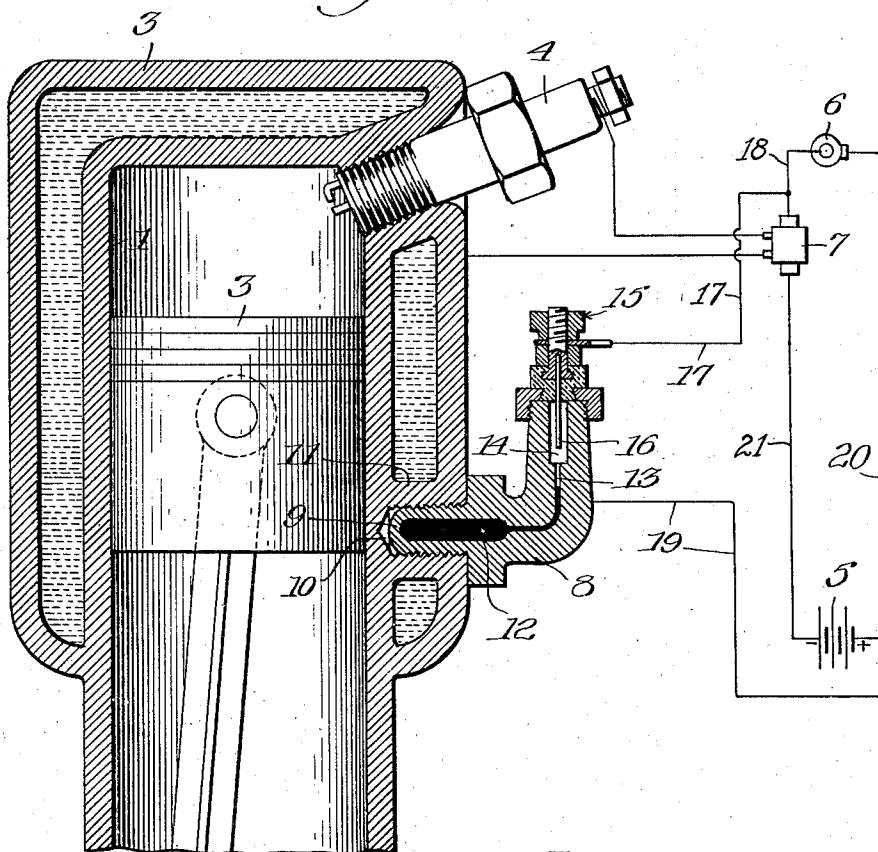
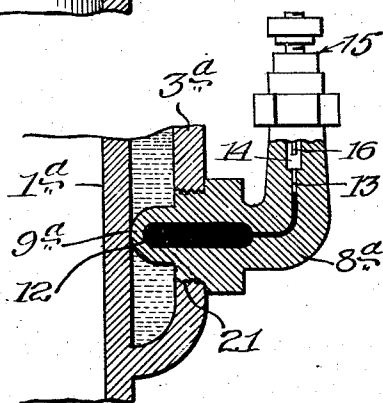


Fig. 2.



Inventor:
Lester P. Bartow,
By Eugene Cavan,
Attorney

UNITED STATES PATENT OFFICE

LESTER P. BARLOW, OF STAMFORD, CONNECTICUT

SAFETY FIXTURE FOR ENGINE CYLINDERS

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This invention relates to safety means for preventing the overheating of cylinders of internal combustion engines and particularly automobile and like engines.

5 One object of my invention is to provide means for interrupting the ignition circuit to the engine cylinder or cylinders whenever the walls thereof reach a predetermined high temperature, and thus prevent overheating
10 of the cylinders by ceasing the explosions therein.

A further object of my invention is to have this means restore the ignition circuit to the cylinders upon dropping of the temperature thereof below said high point and thus make
15 the means automatic in its action to continue the power strokes of the engine, all without the attention of the engine operator.

Another object of my invention is to have
20 the heat responsive part of the means in the form of mercury, which on being moved by the heat of the cylinder wall into and out of contact with an electrode connected with the electrical ignition system will effect the making and breaking of a circuit through the
25 means to automatically interrupt and restore the ignition circuit to the cylinder for the purpose stated.

The invention consists further in the matters hereinafter described and claimed.

In the accompanying drawings—

Fig. 1 is a vertical sectional view of a cylinder of an internal combustion engine cylinder and showing applied thereto a fixture of
35 my invention; and

Fig. 2 is a similar view showing how my improved fixture is applied to the present day cylinder construction.

In the drawings, 1 indicates the wall of
40 the engine cylinder proper; 2, the reciprocable piston therein; 3, the outside wall of the water jacket; and 4, the spark plug at the upper end of the cylinder as in assemblies of this kind.

45 The ignition system for the engine includes primary and secondary circuits. The former includes a battery 5 or other source of current supply, a motor make and break 6, and an ignition coil 7, all connected by suitable
50 wiring as shown in Fig. 1. The secondary

circuit includes the coil 7 and the spark plug 4 of the cylinder, as well as the other cylinders and their plugs in the multiple cylinder type of engine as now employed for automotive purposes.

The fixture of my invention has a cast iron body 8 in the shape of an elbow and having an integral bulb-like projection 9 at one end to be screwed into a threaded recess 10 provided therefor in a web 11 extending between and
60 connecting the cylinder and jacket walls 1, 2 adjacent the lower end of the jacket, as shown in Fig. 1. The bulb 9 is filled with mercury 12 and is long enough to extend to the cylinder wall 1 so as to be either in direct contact
65 therewith or close enough to said wall to be affected by the heat thereof. With the web 11 integral with the cylinder wall 1, as shown, and the bulb in contact with the web, the bulb is in effect in contact with said wall for heat
70 transferring purposes.

The body 8 of the fixture extends upwardly on the outside of the cylinder and has an upwardly extending narrow passage 13 leading from the chamber of the bulb 9 to a chamber
75 14 at the upper end of the fixture. Screwed on the upper end of the fixture is a terminal assembly 15, which carries a platinum electrode 16 arranged to extend down into said chamber, as shown. The terminal 15 is connected
80 by a wire 17 with a wire 18 which connects the make and break 6 with the induction coil 7, while the body of the fixture is connected by a wire 19 with the positive side 20 of the primary circuit, as shown in Fig. 1. 85

The other side of the coil 7 is connected by a wire 21 to the negative side of the battery 5, as shown.

The operation of the safety stop is as follows: The parts are so made and proportioned that, as long as the cylinder wall 1 is under a predetermined high temperature, the mercury in the fixture remains out of contact with the electrode 16 and no current is passed through the fixture from the primary circuit. 95
This allows the primary and secondary circuits to function as intended to continue the operation of the engine. Should the cylinder wall 1 rise to the predetermined high temperature, the mercury in the fixture will 100

be expanded by the heat of such wall and caused to be raised into contact with the electrode 16. This will close the circuit through the fixture and interrupt the current flow through the secondary circuit, as the fixture is connected with the primary circuit in advance of the secondary circuit, as shown. When this happens, the ignition to the cylinders is cut off and no more explosions take place therein to continue to heat the same. The ignition remains cut off until the temperature of the cylinder wall drops below the predetermined point, whereupon the mercury recedes from contact with the electrode 16 and the current will again be restored to the secondary circuit to supply the spark plugs to continue the power strokes of the engine.

With the coil 7 in the fixture circuit, the primary of the coil 7 acts as a choke or resistance and safeguards the electrodes from burning, as well as makes immediate discharge of the battery impossible.

The action just described is automatic and requires no attention by the operator of the engine. With the ignition instantly cut off as soon as the cylinder wall reaches a predetermined high temperature, overheating of the engine to do damage, as heretofore, is avoided. With the ignition automatically restored as soon as the temperature of the cylinder wall drops below the danger point, the engine will continue its power strokes.

With a water cooled system, the fixture will be made to interrupt the ignition to the cylinders around 212° F. and thus prevent boiling away of the liquids in the system. With a vapor cooled system, the fixture would be made to function at the maximum steaming temperature, say 220° F., so as to avoid excess steaming and lowering the water level below the danger point. With an air cooled system, the predetermined temperature would be that as considered dangerous for the cylinder wall. In all cases, the fixture would function at the proper temperature to prevent overheating as previously stated.

Automobile engines of the present day design are not built with a web 11 extending between and integrally connecting the cylinder and jacket walls 1 and 3, as shown in Fig. 1. Consequently, the particular fixture of Fig. 1 could not be used with such engines. In Fig. 2, I have shown the form of fixture required for the present day engines. As illustrated, the body of the fixture 8* is threaded so as to be screwed directly into a threaded hole 21 made in the outside wall 3* of the jacket, and has its bulb 9* extending across the jacket space and in direct contact with the cylinder wall 1* so as to be subjected to the heat thereof. The rest of the structure is the same as in Fig. 1.

The details of structure shown and described may be variously changed and modified

without departing from the spirit and scope of my invention.

I claim as my invention:

1. The combination with a cylinder of an internal combustion engine, of an electrical ignition system for said cylinder, a fixture containing mercury and having a metal projection at one end forming a bulb inserted into an opening in the outer wall and extending to the inner wall and in direct contact with the metal portion of said inner wall, an electrode carried by the fixture in the path of the mercury, and electrical conductors connecting the body of the fixture and electrode, respectively, with the ignition system so as to interrupt the ignition to the cylinder upon the mercury rising into contact with the electrode upon the cylinder wall rising to a predetermined high temperature.

2. The combination with a jacketed cylinder of an internal combustion engine, of an electrical ignition system for said cylinder, a web extending between and integrally connected with the cylinder and jacket walls, respectively, and having a recess therein, a fixture containing mercury and having a metal projection at one end forming a bulb to fit into said recess, an electrode carried by the fixture in the path of the mercury, and electrical conductors connecting the body of the fixture and electrode, respectively, with the ignition system so as to interrupt the ignition to the cylinder upon the mercury rising into contact with the electrode upon the cylinder wall rising to a predetermined high temperature.

In testimony whereof I affix my signature this 9th day of September, 1926.

LESTER P. BARLOW.