

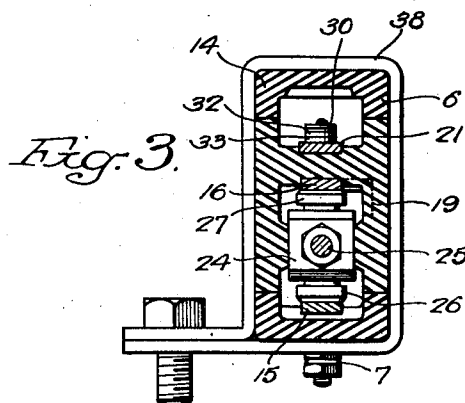
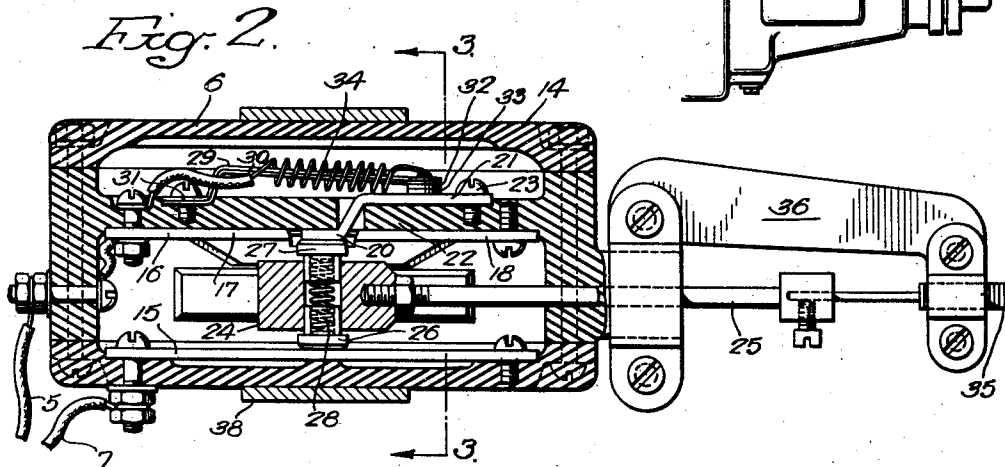
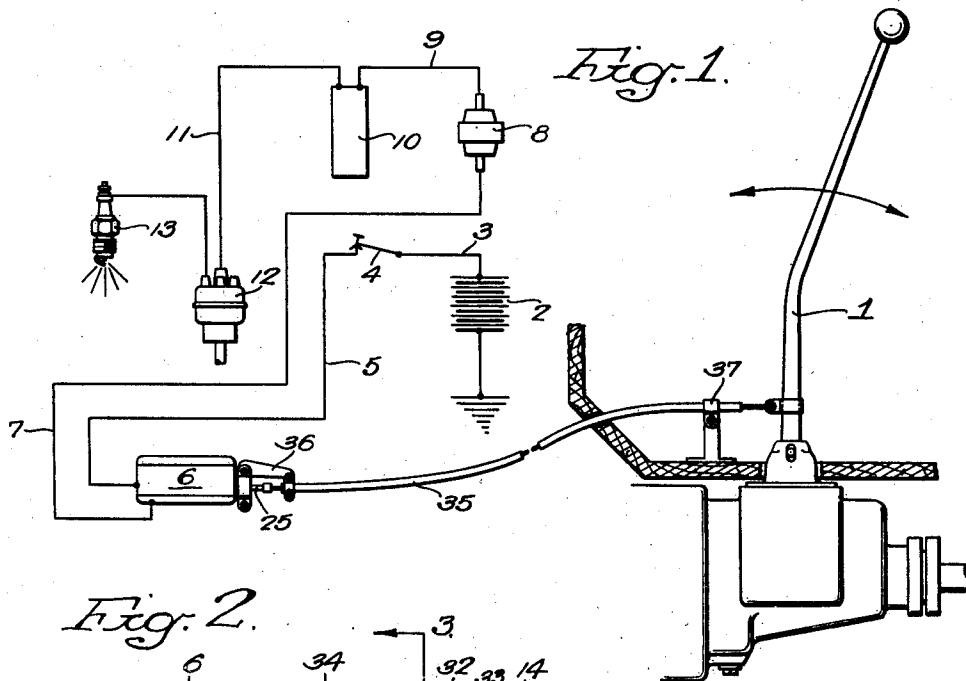
Jan. 2, 1934.

S. MILONE

1,942,115

AUTOMOBILE APPLIANCE

Filed Feb. 24, 1933



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## UNITED STATES PATENT OFFICE

1,942,115

## AUTOMOBILE APPLIANCE

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Application February 24, 1933. Serial No. 658,465

8 Claims. (Cl. 123—146.5)

This invention relates to devices for automatically stopping an engine and, more particularly to devices for stopping the engine of an automobile or like vehicle after a predetermined period of idling of the engine with the transmission gears in neutral or disengaged positions.

Heretofore, there have been proposed various devices for accomplishing this general purpose to prevent the generation in closed garages and the like of quantities of carbon-monoxide gas sufficient to cause injury or death to occupants of an automobile, and also to prevent unnecessary waste of fuel.

An object of the present invention is to provide an improved simple and efficient device for accomplishing the desired purpose.

Another object of the invention is to provide a device of this nature which may be readily incorporated in an existing automobile structure.

Other objects and features of the invention will appear as the description proceeds. In the drawing:

Fig. 1 is a diagrammatic illustration showing a device constructed in accordance with the invention in contemplated association with certain automobile parts;

Fig. 2 is a detail sectional view of the device of the invention; and

Fig. 3 is a detail sectional view taken along line 3—3 of Fig. 2.

Referring to Fig. 1 of the drawing, 1 designates the usual gear-shift lever, by means of which the transmission gear of the automobile may be shifted or changed as well known. The usual grounded storage battery is shown at 2. The ungrounded terminal of the battery is connected via conductor 3 to the ignition switch 4, which, in turn, is connected via conductor 5 to the device 6, to be described in detail hereinafter. Conductor 7 connects device 6 to the usual timer or interrupter 8, which, in turn, is connected via conductor 9 to the induction coil 10. The secondary of this coil is connected in the usual fashion, via conductor 11, the distributor 12 which serves to distribute the high tension current to spark plugs 13 (only one shown), as well understood. The ignition circuit comprises then the battery 2, conductor 3, ignition switch 4, conductor 5, device 6, conductor 7, timer 8, conductor 9, coil 10, conductor 11, distributor 12, and spark plugs 13.

In accordance with the present invention, there is provided a unitary device designated generally by reference character 6. Referring to Figs. 2 and 3, this device comprises a casing or housing 14 within which are disposed stationary contact bars

15 and 16. The contact bar 16 comprises two aligned portions 17 and 18 connected by an integral side portion 19 (see Fig. 3). A third stationary contact bar or segment 20 is disposed between the aligned portions 17 and 18 and has a terminal portion 21 extending upward through a partition 22 of the housing and anchored thereto at 23. A reciprocally movable block 24 is carried at the end of rod 25. Block 24 carries opposed electrically conductive brushes 26 and 27, which are preferably resiliently mounted and urged outward by means of an interposed spring 28. It is essential that the brushes be electrically connected to each other and spring 28 may take the form of a metallic coiled spring connecting the brushes both mechanically and electrically. Block 24 may be formed of insulating material. During reciprocating movement of the block, the brushes engage the opposed stationary contact bars, as illustrated. It will be apparent that when the block is positioned away from the center of the device, the brushes will engage contact bars 15 and 16 to complete the ignition circuit therebetween. When, however, the block is centrally disposed, the brushes will engage contact bars 15 and 20.

There is also provided a time delay switch 29, which may take the form of a thermostatic switch as illustrated. This switch comprises a bimetallic arm 30 rigidly fastened to partition 22 at one end, as at 31, and carrying a contact 32 at its other end. The device also comprises a stationary contact 33 which is attached to terminal 21 and is normally in engagement with contact 32. An energizing winding or heating coil 34 surrounds arm 30 and is connected at one end to contact arm 16 and at its other end to contact 32. It will be apparent that the parts of device 6 form a unitary assembly which may be readily mounted on an existing automobile.

It will now be seen that when block 24 is centrally disposed so that the brushes engage contact bars 15 and 20, the heating coil 34 of the thermostatic switch will be included directly in the ignition circuit. After a predetermined short interval during which the ignition current flows through coil 34, the bimetallic arm 30 will be flexed due to its heat-responsive characteristic and the thermostatic switch will be opened at contacts 32 and 33, thereby opening the ignition circuit and stopping the engine. The thermostatic switch may, of course, be designed to give any desired period of operation. When block 24 is disposed away from the center of device 6, however, so that the brushes engage contact bars

15 and 16, the heating coil of the thermostatic switch will be excluded entirely from the ignition circuit, as will be apparent. It will be noted that the arrangement of the contacts is such that the ignition circuit is not broken during movement of the upper brush. This not only avoids momentary interruption of the circuit but also avoids arcing and its destructive tendencies. As clearly shown in Fig. 3, the housing is formed to provide guide portions for the reciprocating block and rod.

Rod 25 is connected by means of a flexible cable 35 to the gear-shift lever 1. If desired, one of more guide supports 36 and 37 may be provided for the rod and cable. Since the directions of movement of the gear-shift lever during actuation thereof from the neutral position shown are as indicated by the arrows in Fig. 1, it will be obvious that whenever the gears are placed in meshed condition by movement of the gear-shift lever, the position of the movable block of device 6 will be such as to exclude the time delay-switch from the ignition circuit. When, however, the gear-shift lever is in neutral position as illustrated, the movable block of switch 6 will be centrally disposed and the time delay switch will function in the manner above described to open the ignition circuit after a short interval.

Housing 14 may be formed of several insulating parts, as shown, to facilitate assembling of the device and access to the parts thereof. If desired a supporting bracket such as shown at 38 may be used to mount the device in desired position.

It is important to note that the device of the invention is very simple, involving only a few simple parts, and that it takes the form of a unitary structure that may be readily used in an existing automobile. It is also to be noted that the device requires no circuit other than the usual ignition circuit and it utilizes the ignition current itself for actuation of the thermostatic switch. These advantages, as well as others, which will be apparent to persons skilled in the art, render the device a marked improvement over prior devices intended for the same purpose.

Although the invention has been illustrated and described herein with reference to a specific diagrammatic illustration, it will be understood that various changes and modifications may be resorted to without departing from the spirit and scope of the invention.

I claim:

1. In combination with an internal combustion engine and an ignition circuit therefor, a time-delay switch, and means for including said switch directly in said circuit at desired times to open said circuit after a predetermined interval, and for excluding said switch entirely from said circuit at other times.

2. In combination with an internal combustion engine and an ignition circuit therefor, a time-delay switch, and a sliding contact switch adapted to include said time-delay switch directly in said circuit at desired times to open said circuit after a predetermined interval, and to exclude said time-delay switch entirely from said circuit at other times.

3. In a vehicle having an internal combustion engine, an ignition circuit therefor, and a transmission gear-shift lever, a time-delay switch,

and means controlled by said gear-shift lever for including said switch directly in said circuit when said lever is in neutral position, and for excluding said switch entirely from said circuit when said lever is in gear-engaging position.

4. In a vehicle having an internal combustion engine, an ignition circuit therefor, and a transmission gear-shift lever, a time-delay switch, a sliding contact switch adapted in one position to include said time-delay switch directly in said circuit, and in another position to exclude said time-delay switch entirely from said circuit, and a connection between said lever and the sliding contact of said last switch, whereby said last switch is actuated in accordance with the position of said lever.

5. In a vehicle having an internal combustion engine, an ignition circuit therefor, and a transmission gear-shift lever, a unitary device comprising a time-delay switch, and a switch controlled by said gear-shift lever for including said time-delay switch directly in said circuit when said lever is in neutral position, and for excluding said time-delay switch entirely from said circuit when said lever is in gear-engaging position.

6. In combination with an internal combustion engine and an ignition circuit therefor, a time-delay switch, and means for operatively associating said switch with said circuit at desired times to open said circuit after a predetermined interval, and for rendering said switch inoperative at other times, said means comprising a switch in said circuit having spaced parallel contact bars and a reciprocable member carrying opposed brushes engaging said bars.

7. In combination with an internal combustion engine and an ignition circuit therefor, a time-delay switch, and means for operatively associating said switch with said circuit at desired times to open said circuit after a predetermined interval, and for rendering said switch inoperative at other times, said means comprising a switch in said circuit having a stationary contact bar with electrically connected aligned segments, a stationary contact bar between said segments and aligned therewith, a stationary contact bar spaced from the aforesaid bars and parallel therewith, and a reciprocable member carrying opposed brushes engaging said bars.

8. In combination with an internal combustion engine and an ignition circuit therefor, a time-delay switch, and means for operatively associating said switch with said circuit at desired times to open said circuit after a predetermined interval, and for rendering said switch inoperative at other times, said means comprising a switch in said circuit having a stationary contact bar with electrically connected aligned segments, a stationary contact bar between said segments and aligned therewith, a stationary contact bar spaced from the aforesaid bars and parallel therewith, and a reciprocable member carrying opposed brushes engaging said bars, said time-delay switch being connected between the first two of said bars, whereby said time-delay switch is included in said ignition circuit when said reciprocable member is centrally disposed, and is excluded from said ignition circuit when said reciprocable member is otherwise disposed.

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