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AUTOMATIC IGNITION CUT-OUT APPARATUS FOR GAS ENGINES

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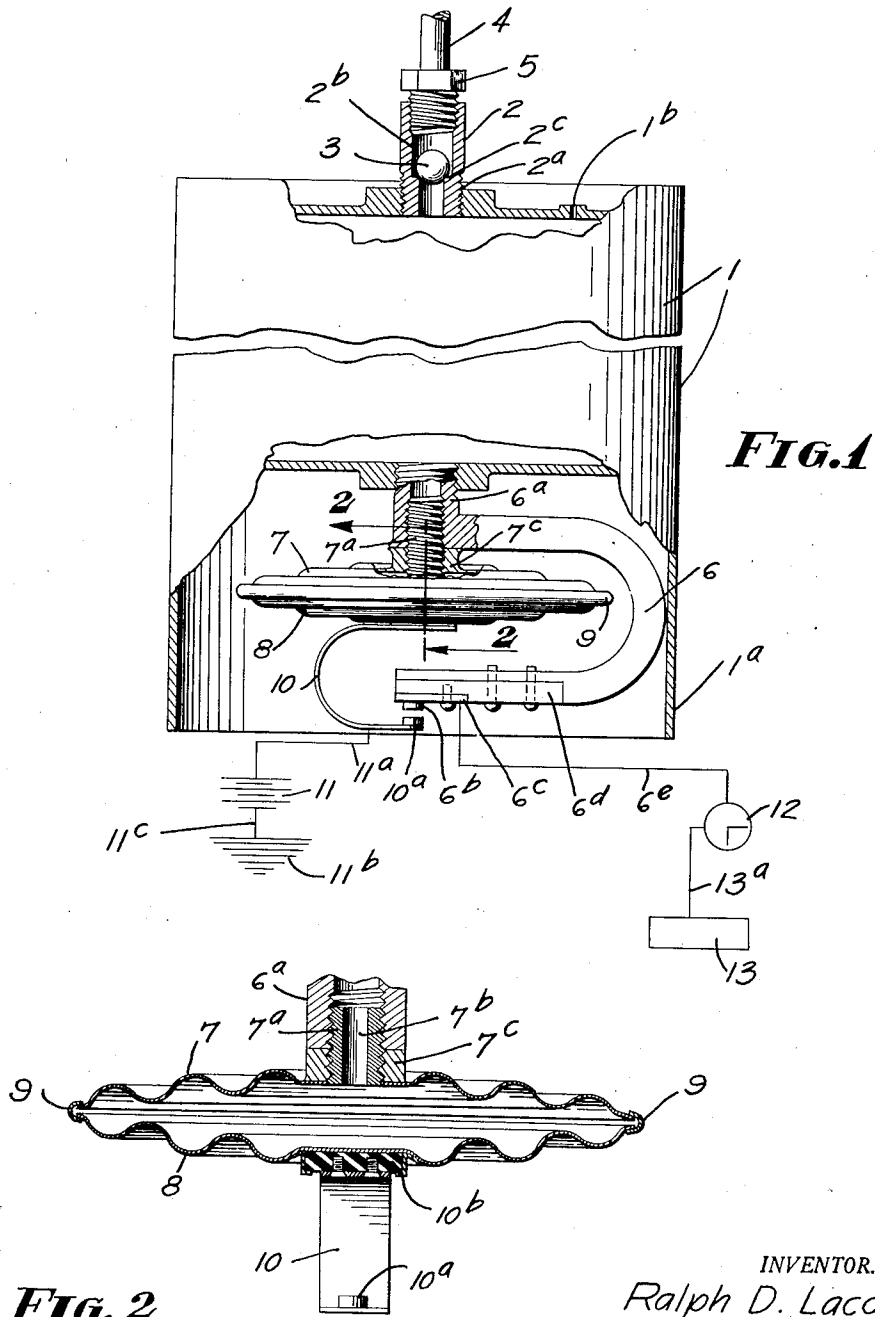


FIG. 2

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AUTOMATIC IGNITION CUTOUT APPARATUS FOR GAS ENGINES

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2 Claims. (Cl. 200—83)

My invention relates to an automatic ignition cutout apparatus for gas engines, and the objects of my invention are:

First, to provide an apparatus for automatically cutting out the ignition, thus preventing the loss of current when the engine stops so that there is no drainage on the battery from the ignition when the engine is not in operation;

Second, to provide an apparatus of this class which operates automatically by vacuum release from the intake manifold of the gas engine;

Third, to provide an apparatus of this class which is controlled by the conventional switch mechanism for starting the gas engine and is applicable for operation with the conventional starter;

Fourth, to provide an apparatus of this class which is not affected by the back fire from the gas engine;

Fifth, to provide an apparatus of this class in which the vacuum pressure is substantially constant and will operate effectively when the vacuum is low, for instance, when operating under full throttle; and

Sixth, to provide an apparatus of this class which is very simple and economical of construction, easy to operate, efficient in its action, and which will not readily deteriorate or get out of order.

With these and other objects in view as may appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts and portions as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawing and to the characters of reference thereon which form a part of this application, in which:

Figure 1 is a fragmentary side elevational view of my apparatus showing parts and portions broken away and in section to facilitate the illustration and showing diagrammatically certain portions thereof, and Fig. 2 is an enlarged sectional view through 2—2 of Fig. 1.

Similar characters of reference refer to similar parts and portions throughout the several views of the drawing.

The vacuum tank 1, valve seat and connection member 2, ball valve 3, vacuum conductor 4, vacuum conductor connection 5, contact support 6, diaphragm members 7 and 8, diaphragm connector 9, contact support 10, battery 11, switch 12, and ignition coil 13, constitute the principal parts and portions of my automatic ignition cutout apparatus for gas engines.

The vacuum tank 1 is of any shape or form desired. In this case I have shown it cylindrical in form. It is constructed to withstand the vacuum pressure from the gas engine. It is provided with an extended skirt portion 1a which extends downwardly adapted to form a shield or guard for the switch control apparatus. It is provided in its upper end with a connector member 2 which is screw threaded therein by means of threads 2a. This connector member is provided with an enlarged portion 2b forming a shoulder 2c upon which rests the ball 3 which together with the shoulder 2c forms a valve which prevents back pressure into the vacuum tank 1 in case the engine backfires. This connector member 2 connects with a conductor 4 which extends to the intake manifold of the gas engine for providing vacuum pressure in the tank 1 and it is connected by means of a conductor connection 5 which is of any conventional type for securing the conductor 4 to the connector 2.

The tank 1 is provided with a small vent opening 1b which is small enough so that under ordinary operation of the engine it does not materially affect the vacuum but when the engine is closed off and does not operate sufficient air will be admitted through the opening 1b to release the vacuum control of the ignition. Mounted centrally in the lower side of the tank 1 is a connector 6a which is screw threaded into said tank and this connector 6a is provided with a contact support 6 which is substantially U-shaped, as shown best in Fig. 1 of the drawing.

Secured to the normally lower side of the member 6a is a connector 7a which is screw threaded and adapted to fit into the connector 6a and is provided with a bore 7b which is adapted to communicate with the interior of the vacuum tank 1. Secured to this member 7a is a diaphragm member 7 which is preferably a corrugated diaphragm to provide great flexibility, it being noted that this diaphragm 7 is stationary as it is secured rigidly to the tank 1. Connected with this diaphragm 7 is another similar diaphragm 8 in opposed relation thereto, both of which are shown best in Fig. 2, and they connect at their periphery by means of a diaphragm connecting member 9 which is secured over the edge of this periphery and forms a sealed joint between the two edges and also provides additional flexibility in the joint. Secured to this diaphragm member 8 is the contact support 10 which is preferably U-shaped, as shown, and provided with a contact member 10a on its

one end which is adapted to contact with a contact member 6b mounted on the contact support 6. The other end of the support 10 is supported on the diaphragm 8 by means of an insulated member 10b, shown best in Fig. 2 of the drawing. Between the diaphragm member 7 and the connector 6a there is provided a filler 7c which forms a close joint around the member 7a so that there will be no leakage at this point. The contact 6b is supported on the contact support 6 by means of a member 6c secured to an insulated member 6d which is secured on the support 6, thus providing means of insulating the contact 6b from the support 6.

Connected with the support 10 is a battery 11 by means of an electrical connector 11a and this battery is connected with a ground 11b through a conductor 11c. Connecting with the member 6c is an electrical conductor 6e which extends to the switch 12 which is a conventional switch, and this switch 12 connects with an ignition coil 13 through the conductor 13a. The switch 12, ignition coil 13, battery and ground are all conventional type of ignition system for gas engines.

The operation of my apparatus is as follows: When the engine is operating by being started with the starter, vacuum pressure is provided in the vacuum tank 1 through the conductor 4, raising the check ball valve 3 and forming a vacuum in the tank 1 which is substantially constant as long as the engine is running, and does not vary where the throttle is varied to full or partial throttle. However, if the engine stops, air is admitted through the vent opening 1b and reduces the vacuum in the tank 1. The ball 3 provides a check so that in case the engine backfires and draws pressure outwardly through the intake manifold the valve 3 closes the opening and does not permit the pressure to enter the vacuum tank. When the engine is operating normally, vacuum operates on the diaphragm 8, contracts the same and closes the contacts 6b and 10a and the ignition is on at all times. However, if the engine stops, the vacuum is reduced and the diaphragm draws the contact support 10 outwardly and opens the points 10a and 6b cut-

ting out the ignition and thus stopping any drainage on the battery.

Though I have shown and described a particular construction, combination and arrangement of parts and portions, I do not wish to be limited to this particular construction, combination and arrangement, but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In an automatic ignition cutout apparatus for gas engines, a vacuum pressure actuated diaphragm, means consisting of opposed flexible diaphragm members the one secured centrally on a stationary member and the other movable throughout its whole area, switch control means in connection with said diaphragm consisting of a contact supported in connection with the stationary side of said diaphragm and another contact engageable therewith supported on the movable side of said diaphragm, and a substantially rigid walled vacuum tank in communication with and forming the stationary support for the stationary side of said diaphragm for providing substantially constant pressure to said diaphragm means.

2. In an automatic ignition cutout apparatus for gas engines, a vacuum pressure actuated diaphragm, means consisting of opposed flexible diaphragm members the one secured centrally on a stationary member and the other movable throughout its whole area, switch control means in connection with said diaphragm consisting of a contact supported in connection with the stationary side of said diaphragm and another contact engageable therewith supported on the movable side of said diaphragm, a substantially rigid walled vacuum tank in communication with and forming the stationary support for the stationary side of said diaphragm for providing substantially constant pressure to said diaphragm means, and means for venting said vacuum tank to relieve the vacuum pressure when the vacuum pressure supply is inoperative.

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