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R. S. TROTT

2,069,931

IGNITION TIMER CONTROLLING MECHANISM

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Fig. 1.

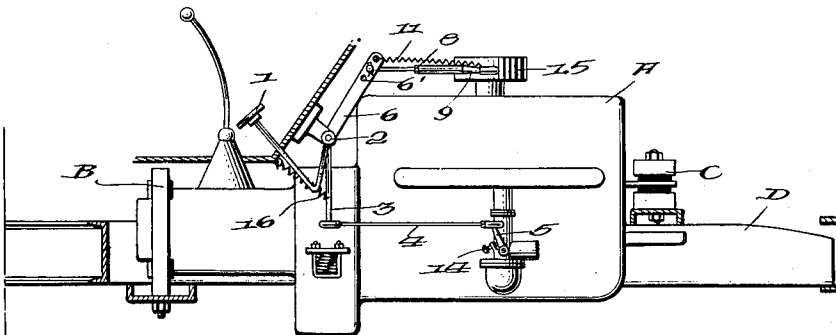


Fig. 2.

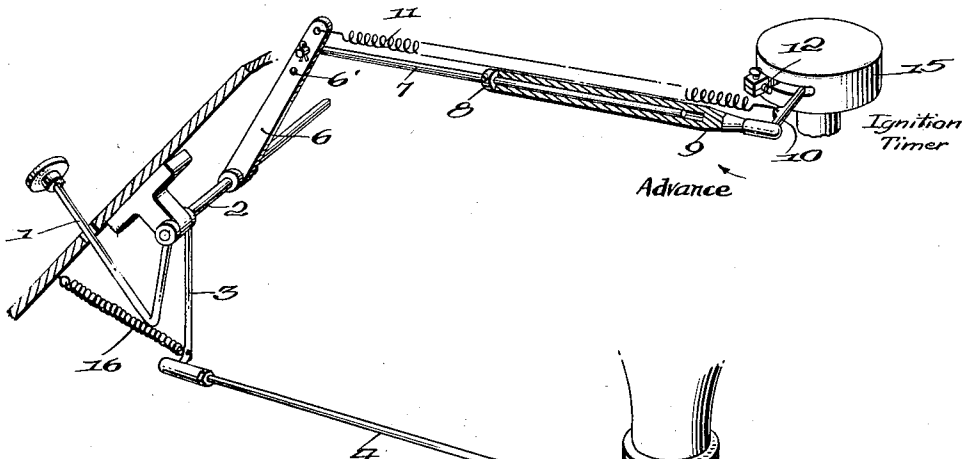
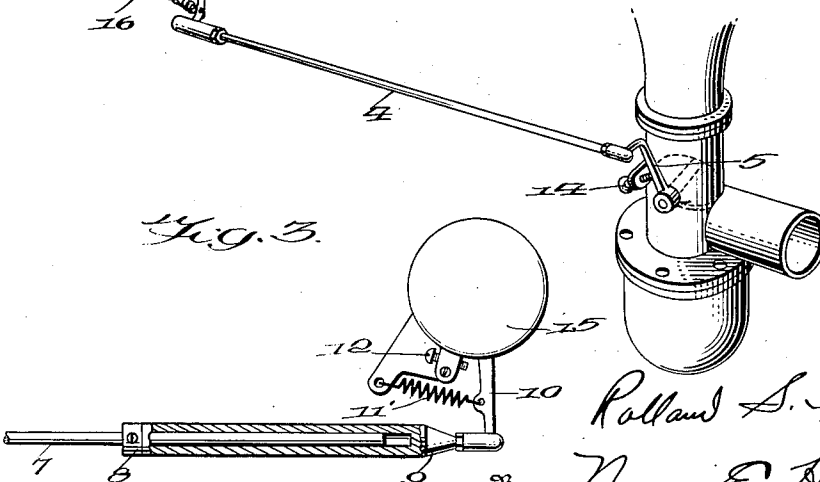


Fig. 3.



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UNITED STATES PATENT OFFICE

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IGNITION TIMER CONTROLLING
MECHANISM

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Application November 30, 1931, Serial No. 578,115

6 Claims. (Cl. 123—98)

This invention relates to the spark control of an internal combustion engine and more especially to such control which is operated by the position of the carburetor throttle controlling mechanism and in a motor vehicle having an engine unit movably mounted with respect to the frame. Ordinarily, the spark position in an automotive vehicle is manually controlled. In some cases, automatic advance governors have been produced but these depend upon increased throttle opening alone to provide the increased speed, which increased speed advances the spark.

It is the object of this invention to provide a spark advancing mechanism operated by the throttle control mechanism which will advance the spark as the throttle is opened and which will nevertheless provide a sufficiently retarded spark for proper idling of the engine, all of which is substantially unaffected by the relative movement of the engine unit and the frame.

I accomplish this object by providing a spring held contact connection between the carburetor throttle operating mechanism and the spark timer of the engine.

This is illustrated in the drawing in which:—
Figure 1 is a side elevation partly in section showing my spark and carburetor control applied to a movably mounted engine unit.

Figure 2 is a perspective view, with certain parts shown in section, showing the accelerator and carburetor throttle connections and one form of spring held contact connection between the throttle control and the timer, in a motor vehicle in which the engine unit may be mounted movably with respect to the frame.

Figure 3 is a plan view, with certain parts shown in section, of a slightly modified form of connection.

My present invention is shown in Fig. 1 as applied to a movably mounted engine unit, substantially as shown in my prior Patent No. 1,834,907, granted December 1, 1931, in which the engine unit A is carried by front and rear non-metallic resilient mountings B and C, respectively, which mount the same on the vehicle frame D so as to permit oscillatory movement of the engine unit relative thereto.

In the construction shown in Figure 2, which is a more or less standard automobile accelerator control construction, the accelerator pedal 1 is carried by the accelerator shaft 2 which may be mounted upon the frame or upon the body of the vehicle. Upon the shaft 2 is mounted an arm 3, to which is pivotally connected the rod 4. The rod 4 is pivotally connected to the carburetor

throttle arm 5. The rod 7 is pivotally connected to a spark arm 6 on the shaft 2 and has the shoulder 8 thereon. The sleeve 9 is pivotally connected to the timer arm 10 and receives the end of the rod 7 and abuts against the shoulder 8 due to the normal action of the spring 11 whose ends are attached in any proper manner to resiliently draw the rod 7 and the sleeve 9 together. The adjustable stop screw 12 acts to stop the advance of the timer arm 10 at the point chosen as the maximum spark advance position.

It will be noted that due to the length of the arm 6, the spark timer arm 10 will strike the stop screw 12 as the accelerator pedal 1 has moved the throttle arm 5 only a short distance, thereby opening the carburetor throttle but slightly. As the accelerator pedal 1 is further depressed in opening the carburetor throttle to its wide open position, the timer arm 10 will continue to remain in contact with the adjusting stop screw 12 under the action of the spring 11, the rod 7 meantime partially pulling out of the sleeve 9 and separating the shoulder 8 from the end of the sleeve 9. When the accelerator pedal 1 is allowed to rise, the throttle arm 5 strikes the adjustable set screw 14 which screw is set for the proper idling position desired for the carburetor throttle valve. As the carburetor throttle valve approaches this idling position, the shoulder 8 of the rod 7 will engage the end of the sleeve 9, after which the rod 7 and sleeve 9 will act as a single connection between the arm 6 and the timer arm 10 and further rising movement of the accelerator will retard the spark to the proper idling position. By connecting the rod 7 to the arm 6 at one of the several positions as indicated at 6', and by proper setting of the timer 15, the set screw 12 and set screw 14, the desired inter-relation between the carburetor and the spark timing may be obtained. It will be seen that the spring 11 in this construction acts to assist the spring 16 in resiliently tending to move the carburetor throttle controlling mechanism to the closed position, after the timer arm 10 contacts the stop screw 12.

In the modification shown in Figure 3, the spring 11' is used in place of the spring 11 shown in the Figure 1. In this construction, the spring 11' however opposes the action of the spring 16 in its endeavor to move the mechanism to the closed throttle position, and although the construction shown in Figure 3 will operate, it requires the proper balance between the springs 16 and 11', and for this reason I prefer the construction shown in Figure 2.

Having now described my invention, what I

claim as new and desire to protect by Letters Patent is as follows:

1. A spark control for an internal combustion engine comprising an accelerator shaft having an accelerator pedal connected therewith, spark and throttle arms mounted on said shaft, throttle actuating means connected with the throttle arm, a timer arm, means connecting said timer arm directly with the spark arm, and resilient means acting directly on the timer arm and tending to move the same toward the spark arm.

2. A spark control for an internal combustion engine comprising an accelerator shaft having an accelerator pedal connected therewith, spark and throttle arms mounted on said shaft, throttle actuating means connected with the throttle arm, a timer arm, a stop located in the path of the timer arm limiting movement of the timer arm to spark advanced position, extensible means connecting the timer arm directly with the spark arm, and resilient means connected with the timer arm and tending to move the same toward the stop.

3. A spark control for an internal combustion engine comprising an accelerator shaft having an accelerator pedal connected therewith, spark and throttle arms mounted on said shaft, throttle actuating means connected with the throttle arm, a timer arm, a stop located in the path of the timer arm limiting movement of the timer arm to spark advanced position, means connecting the timer arm directly with the spark arm, and resilient means connected directly between the timer lever and the spark arm and tending to move the timer arm toward the stop.

4. A spark control for an internal combustion engine comprising an accelerator shaft having an accelerator pedal connected therewith, spark and throttle arms mounted on said shaft,

throttle actuating means connected with the throttle arm, resilient means tending to move the throttle actuating means to throttle closing position, a timer arm, a stop located in the path of the timer arm limiting movement of the timer arm to spark advanced position, extensible means connecting the timer arm with the spark arm, and resilient means connected directly with the timer arm tending to move said arm toward the stop.

5. A spark control for an internal combustion engine comprising an accelerator shaft having an accelerator pedal connected therewith, spark and throttle arms mounted on said shaft, throttle actuating means connected with the throttle arm, resilient means tending to move the throttle actuating means to throttle closing position, a timer arm, a stop located in the path of the timer arm limiting movement thereof to spark advanced position, means connecting the timer arm with the spark arm, and resilient means connected directly with the timer arm tending to move said arm toward the stop, said last-mentioned resilient means being of less resiliency than the first-mentioned resilient means.

6. A spark control for an internal combustion engine comprising an accelerator shaft having an accelerator pedal connected therewith, spark and throttle connections thereon, throttle actuating means connected with the throttle connection, a timer arm, a stop located in the path of the timer arm limiting movement of the timer arm to spark advanced position, lost-motion means connecting the timer arm with the spark connection, and resilient means connected directly with the timer arm tending to move said arm toward the stop.

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