

B. N. DAVIS.
SAFETY ADJUSTER FOR IGNITION TIMERS.
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921,958.

Patented May 18, 1909.

Fig. 1.

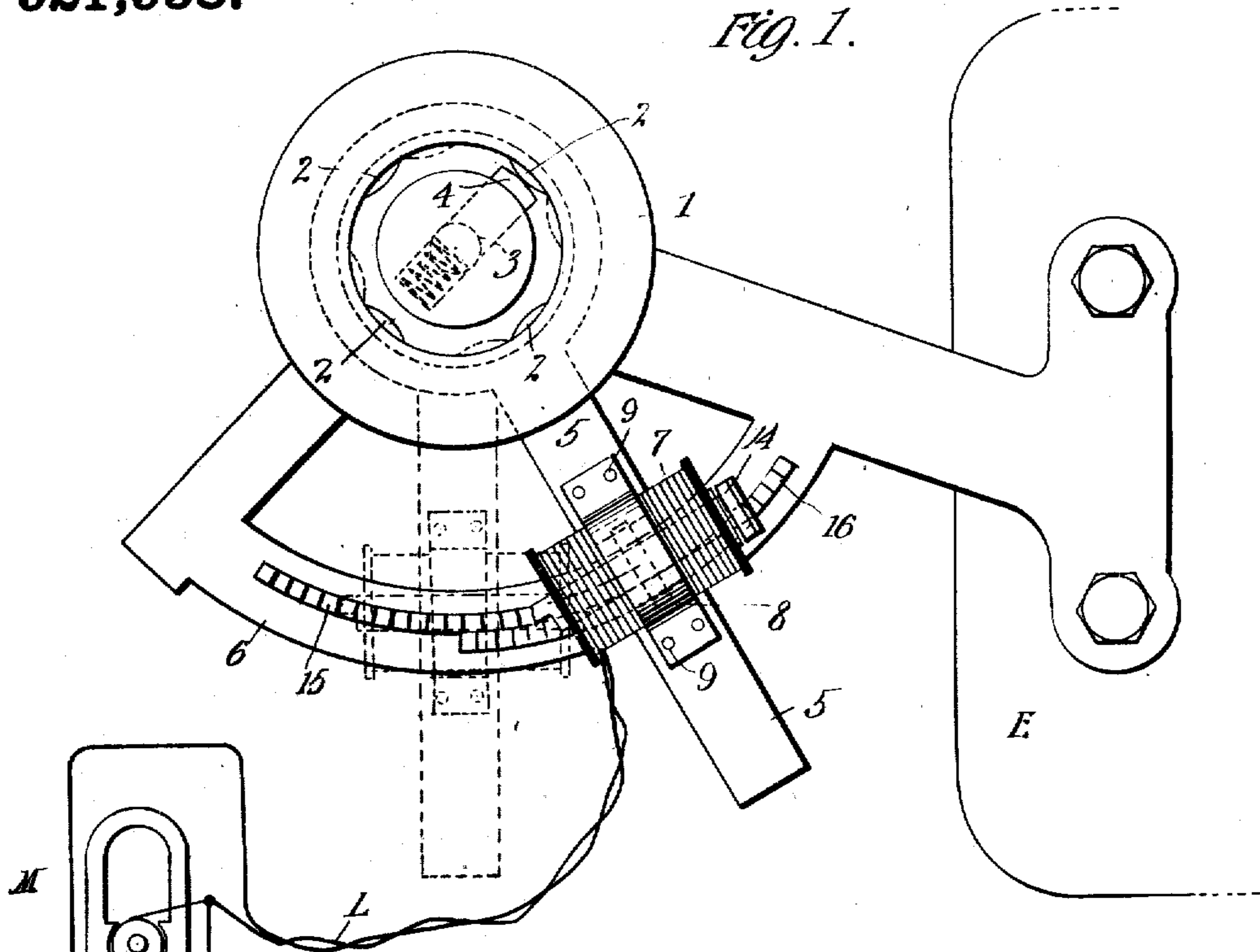
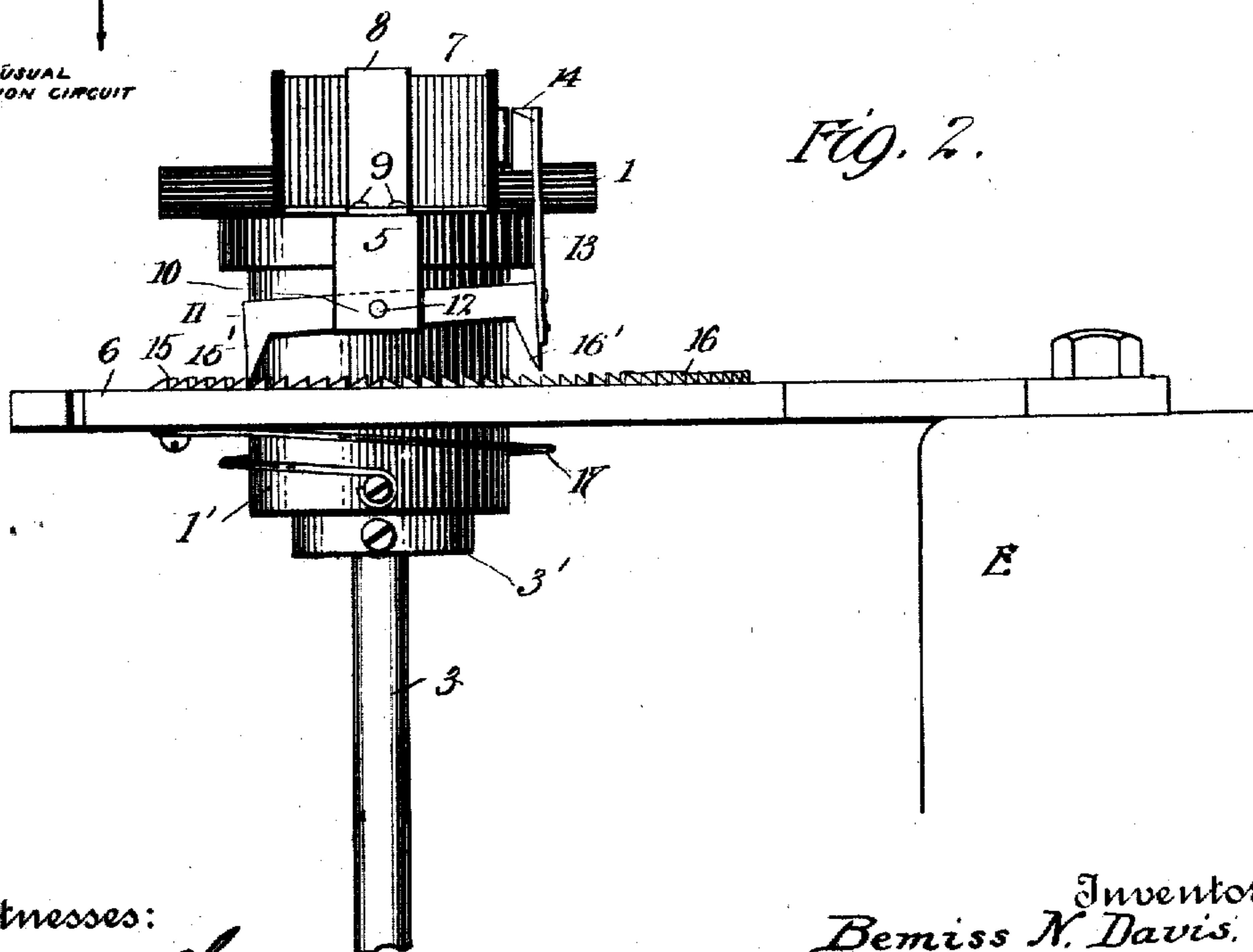


Fig. 2.



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UNITED STATES PATENT OFFICE.

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SAFETY-ADJUSTER FOR IGNITION-TIMERS.

No. 921,958.

Specification of Letters Patent.

Patented May 18, 1909.

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To all whom it may concern:

Be it known that I, BEMISS N. DAVIS, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Safety-Adjusters for Ignition-Timers, of which the following is a full, clear, and exact description.

My invention relates to ignition apparatus for explosion engines, and more particularly consists in a device or attachment for the usual circuit controller or timer by which it is made impossible for the engine to be started with the ignition occurring too early in the cycle.

As well known, the cranking of an engine when the ignition apparatus is adjusted to give an early spark is very dangerous, being almost certain to produce a "kick-back" of the engine, and, unless the operator has this detail constantly in mind, an accident is likely to occur sometime by reason of his forgetfulness.

It is the purpose of the present invention to entirely relieve the mind of the operator from this detail, automatically making it impossible for the spark to be adjusted at a too early position while the engine is being cranked. After the engine is started, however, the circuit controller can be adjusted as usual and can be made to remain at an early or late, or any other ignition period of the engine cycle.

In carrying out my invention I make use of an electric current derived from the dynamo or magneto generator of the ignition system. This current is employed to energize a magnet which controls dogs or detents in such a way that two separate functions are secured, first, an automatic return of the timing lever or circuit controller to its normal or late spark position whenever the engine is stopped, and second, the prevention of any movement of the circuit controller or timing lever from this position until the engine is again running properly. Thus the timing lever cannot continue in an early spark position should it be accidentally left that way when the engine stops, nor can an inexperienced or careless person ignorantly or

thoughtlessly displace the timing lever so as to hold it in an improper position while some one is cranking the engine.

With these and other objects in view my invention consists in the features of construction and combination as hereinafter set forth and claimed.

In the drawings: Figure 1 is a top or plan view of a circuit controlling apparatus having an embodiment of my invention applied thereto. Fig. 2 is a side elevation of the same.

Referring to the drawings, in which like parts are designated by the same reference sign, 1 designates the frame or casing of a circuit controller which contains the segments or contacts 2 concentrically disposed around the half-time or other shaft 3.

4 designates the rotating contact arm carried by shaft 3 and which may be of any desired construction.

In the form of the invention shown, the time of occurrence of the ignition is varied by swinging the casing 1 angularly about its central axis coincident with the shaft 3. For this purpose the casing has a projecting arm 5 which moves over a fixed sector 6. In the present embodiment of the invention the sector 6 is fixed directly to the frame of the engine E, and constitutes the bearing for the rotatable casing 1 of the circuit controller. The casing may be held against vertical displacement by a collar 3' on the shaft 3 which directly engages and supports the bottom portion 1' of the casing which projects slightly beyond the sector 6, as shown in Fig. 1.

It is to be understood that the particular form of circuit controller and the nature of its controlling lever or means constitute no part of my present invention. The form shown is merely a convenient one for purposes of illustration, because the controlling lever is directly associated with the circuit controller casing. It will be evident, however, that my invention is equally applicable to circuit controllers which have their controlling or timing levers situated at a remote point and connected thereto by intervening links and levers. In the case of an automobile, for example, there is usually provided

a sector and timing lever somewhat similar in their form and arrangement to the parts 5 and 6 of Fig. 1, but which are supported on the post of the steering wheel.

7 designates an electromagnet attached to the circuit controller or its associated timing lever 5. I have shown it secured by means of a band 8 which extends over the electromagnet and is screwed or riveted to the lever 5 at the points 9.

10 designates a downwardly extending portion of the lever 5 which carries a fulcrum for a rigid double pawl 11 pivoted to the part 10 by a pin 12. The double pawl 11 has at one end an upward extension 13 which is preferably springy or resilient and which has an armature 14 in proximity to the pole or poles of the electromagnet 7.

15 and 16 denote curved rack sections, of which the rack 15 is adapted to be engaged by the dog 15' of the double pawl 11, while the rack 16 is in the path of the dog 16'. These rack sections have their teeth pointed in opposite ways, the section 15 cooperating with dog 15' to prevent a movement of the timing lever to the left in the drawings, while the rack section 16 cooperates with its dog 16' to prevent a movement of the timing lever to the right.

17 denotes a spiral spring fixed to the circuit controller 1 and to the frame of the sector 6, so as to normally impel the circuit controller angularly to its normal position of rest or starting position, to the extreme left in Fig. 1, and corresponding to the proper position for cranking the engine.

The operation is as follows: Assuming that the engine is at rest, it is evident that the dynamo or magneto generator M (driven of course in the usual way by the engine) will also be at rest, and not generating any current. Accordingly the magnet 7 which lies in the circuit L directly across the terminals of the generator M will be deenergized. The armature 14 will be unattracted, and the double pawl 11 will swing to a position the reverse of that shown in Fig. 2, by virtue of any suitable spring or on account of the preponderating weight of its right-hand end which carries the spring 13 and its armature. Under these circumstances the dog 15' will be disengaged from its rack, and the spring 17 will be free to impel the timing lever toward the left to its starting or late-spark position. This movement is not resisted by the dog 16' which slides idly over its rack teeth 16 in any movement of the timing lever to the left. But the timing lever, once having arrived at its proper starting or late-spark position, cannot be again displaced therefrom until the engine has started, on account of the engagement of said dog 16' with its rack. The operator of the car or

engine can therefore crank his engine with perfect assurance that the spark lever is not out of proper starting position, and this regardless of any officious or careless persons who might be endeavoring to manipulate the lever prematurely at this time. As soon as the engine is properly running and the magneto or generator M is delivering current, the armature 14 will be attracted by the magnet 7, the double pawl 11 will be thrown into its full line position shown in Fig. 2, and the timing lever 5 may be thrown to running position where it is held by the engagement of the dog 15' with the rack 15. The lever may be readily manipulated backward and forward from one position to another by pressing on the armature 14 or on the dog 16' with the finger during any backward movement.

What I claim is:

1. In an ignition system for explosion engines, a device for varying the period of the ignition in the engine cycle, means for impelling said device to a late ignition relation, an electro-magnet for normally restraining said device against such movement, and an electric circuit completed when the engine is running for energizing said electromagnet.
2. In an ignition system for explosion engines, a device for varying the period of the ignition in the engine cycle, means for impelling said device normally to a late ignition relation, a detent for restraining said device in such relation, and an electro-magnet for moving said detent to release said device.
3. In an ignition system for explosion engines, a device for varying the period of the ignition in the engine cycle, means normally impelling said device to a late spark relation, an electro-magnet having an armature with a detent for restraining the movement of said device to such relation, and a circuit carrying current whenever the engine is running and including said electro-magnet, whereby said detent is released when the engine stops.
4. In an apparatus of the class described, a controlling device, a magnet carried thereby, a fixed rack, and a dog displaced by said magnet and adapted to engage said rack.
5. In an apparatus of the class described, a controlling device, a magnet carried thereby, a fixed rack, and a dog for engaging said rack and adapted to be thrown out of its engaging relation by said magnet.
6. In an apparatus of the class described, a controlling device, a magnet carried thereby, a fixed rack, and a dog for engaging said rack and adapted to be thrown into its engaging relation by said magnet.
7. In an apparatus of the class described, a controlling device, a magnet carried thereby, a pair of fixed racks, and a pair of dogs for

engaging said racks, one of said dogs being thrown into its engaging relation by said magnet, and the other dog being released to engage its rack by said magnet.

5 8. In an apparatus of the class described, a movable member having a magnet, a rigid double pawl pivoted to said member and having an armature attracted by said mag-

net, and a pair of racks respectively engaged by the dogs of said double pawl.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

BEMISS N. DAVIS.

Witnesses:

CHAS. F. FLETCHINGER,
ALEX FERRER.