No. 881,460. PATENTED MAR. 10, 1908.

H. H. BROWN.

MAGNETO FOR SPARKING MECHANISMS.

APPLICATION FILED FEB. 14, 1907

2 SHEETS—SHEET 1.

Fig. 1.

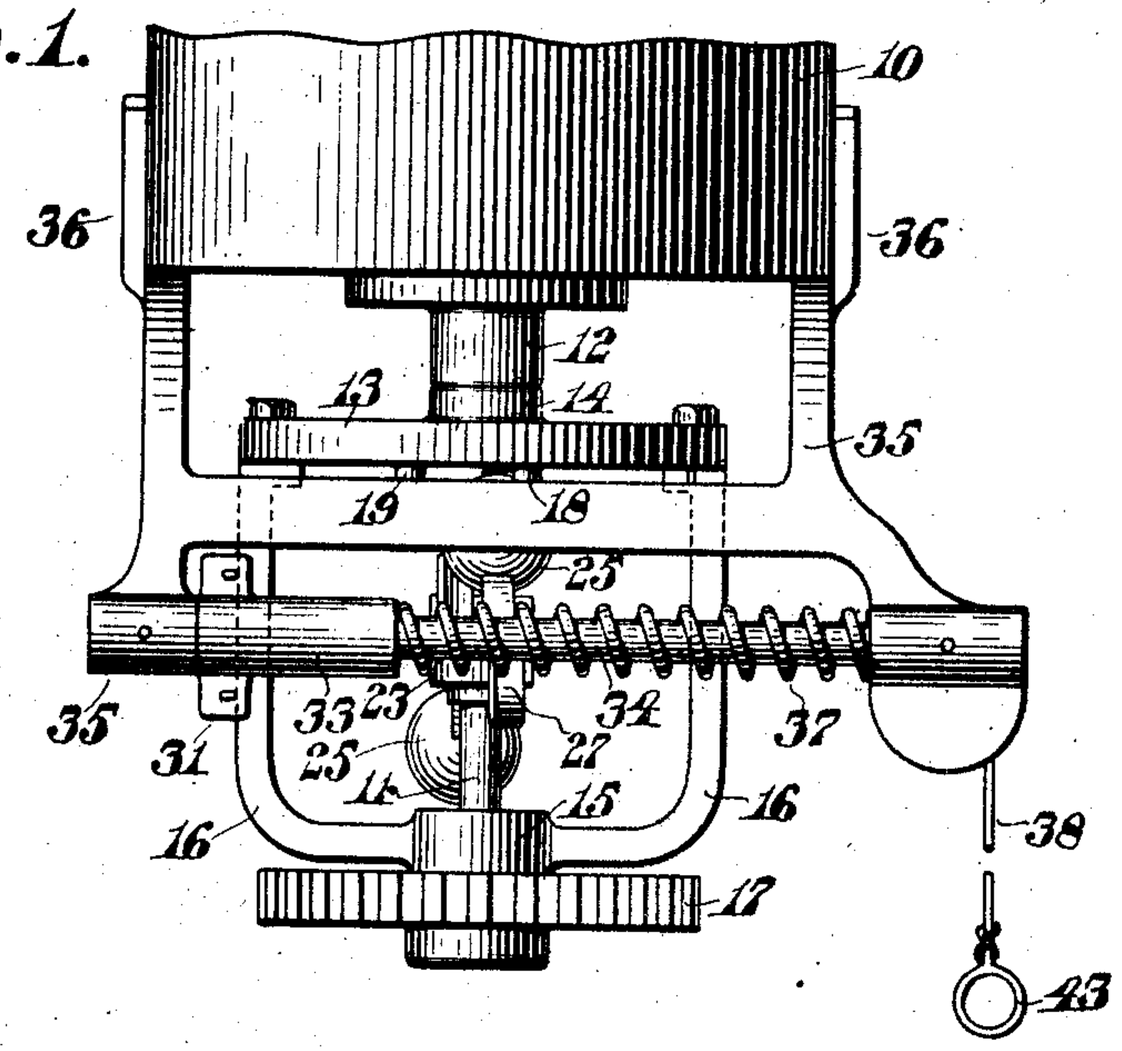
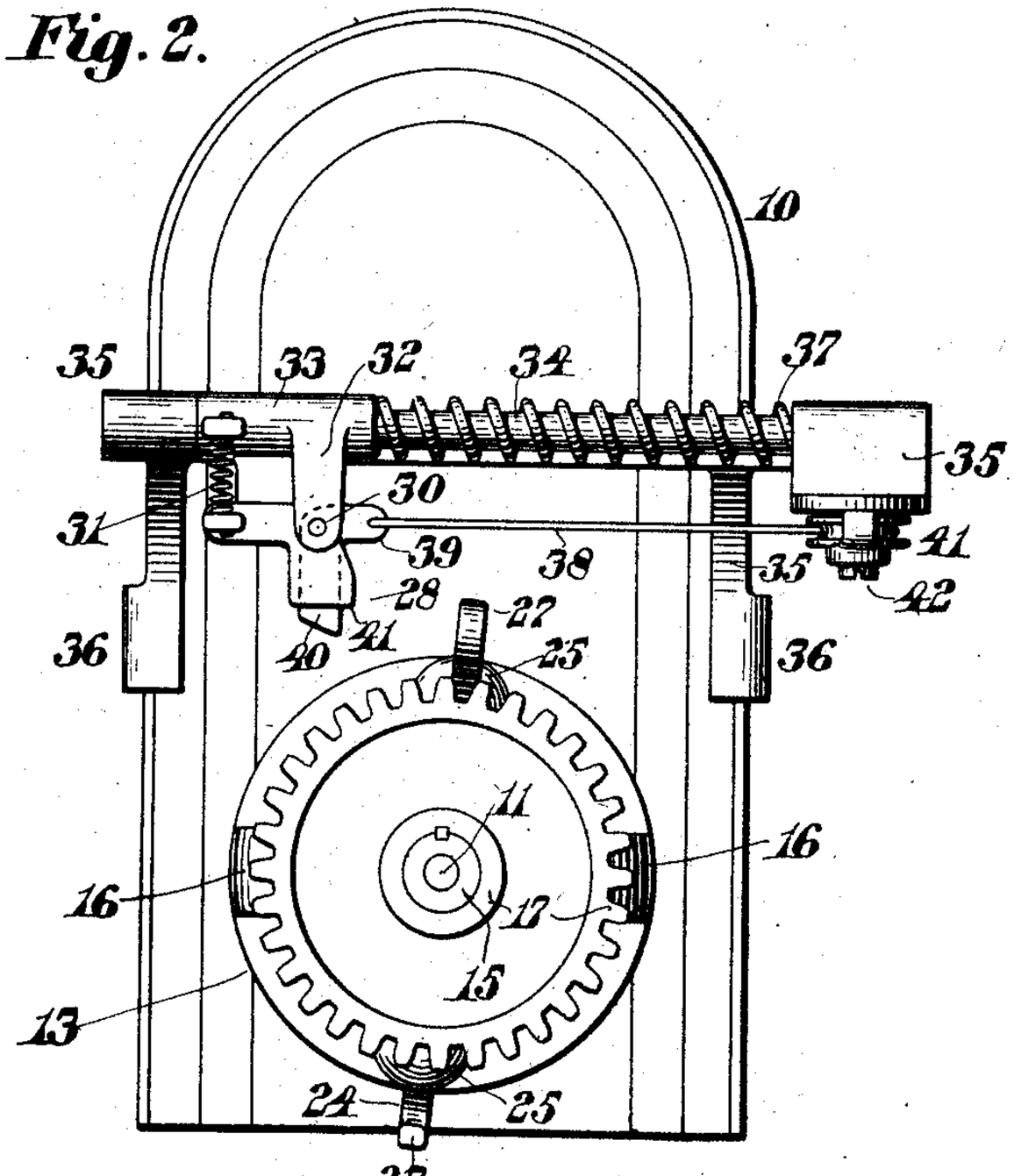


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

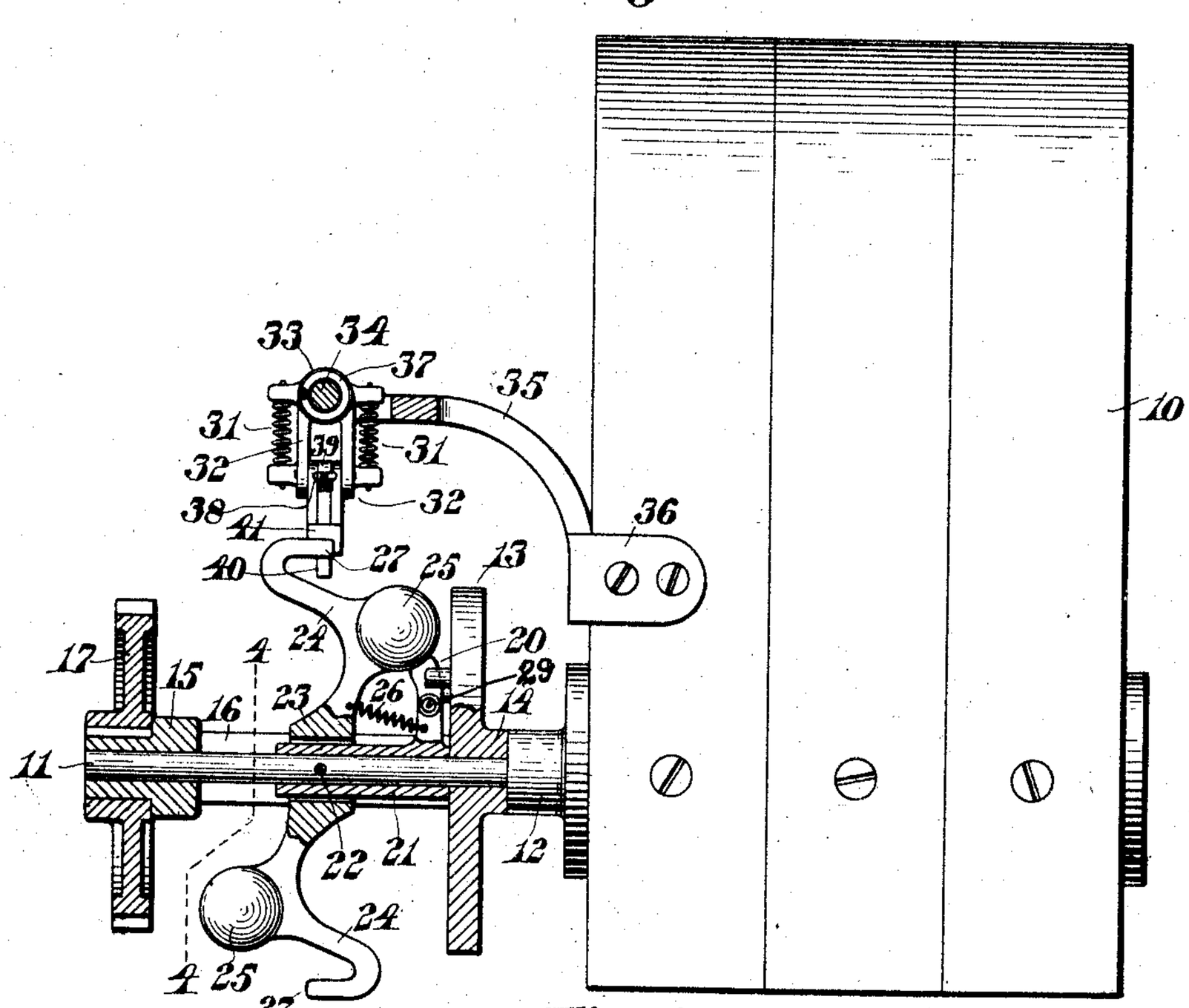
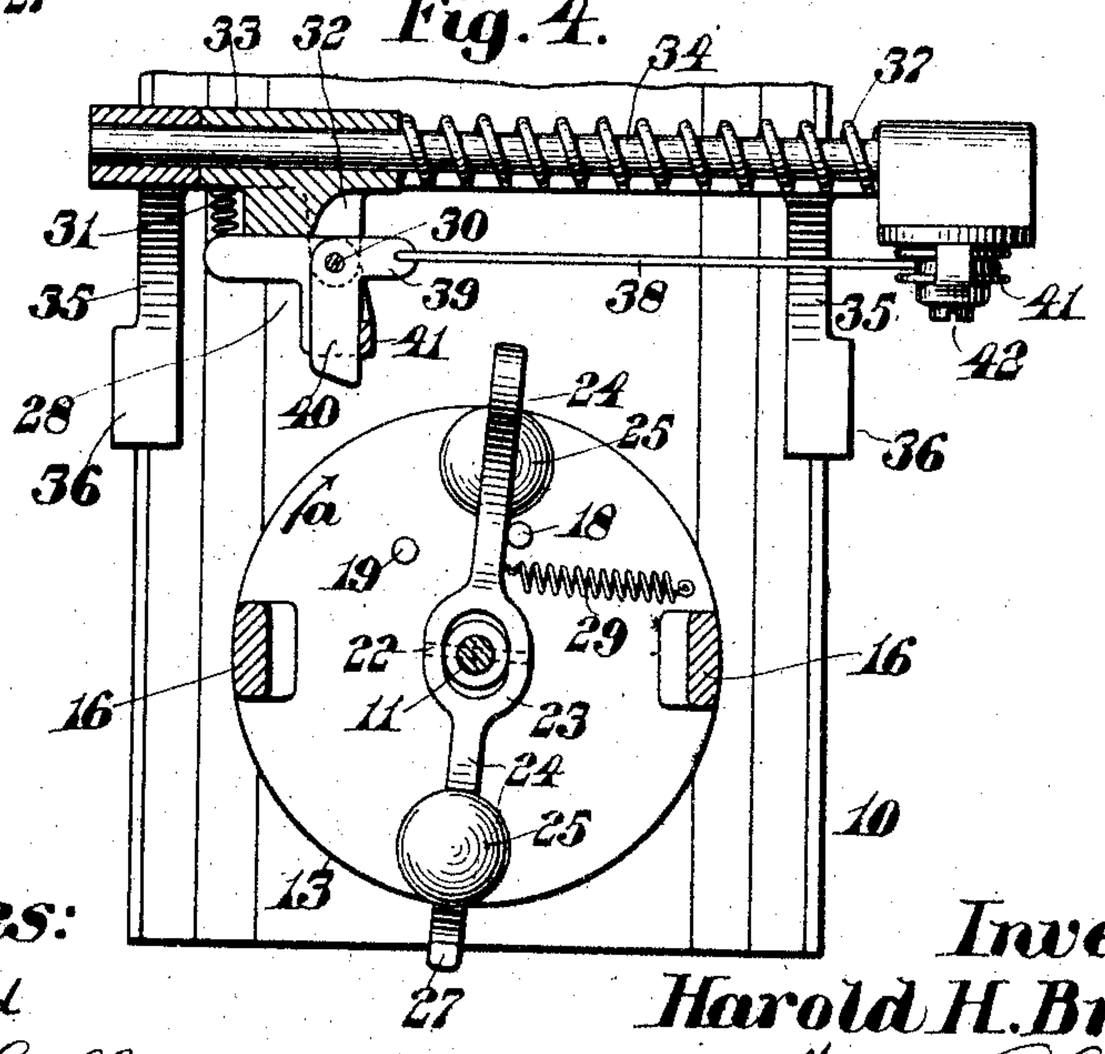


Fig. 4.



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UNITED STATES PATENT OFFICE.

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MAGNETO FOR SPARKING MECHANISMS.

No. 881,460. Specification of Letters Patent. Patented March 10, 1908.

Application filed February 14, 1907. Serial No. 357,380.

To all whom it may concern:

Be it known that I, HAROLD H. BROWN, a citizen of the United States of America, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Magnetos for Sparking Mechanism, of which the following is a specification.

This invention relates to magnetos for sparking mechanism and principally to a device for actuating the armature of magnetos to be used on motor cars whereby at any desired time the requisite movement may be obtained to secure the necessary amount of electric current to effect a proper ignition by means of a spark plug connected thereto in a suitable electric circuit.

Another object of the invention is to provide a means, such as a centrifugal mechanism, which will assist in giving to the armature shaft an additional impetus when said shaft is revolved at a slow rate of speed and which, when the speed of the armature shaft is increased to a desired point, will act to cause the armature shaft to revolve at an unchangeable ratio of speed relative to that of the motor.

A further object of the invention is to provide a means whereby the armature shaft when the motor is at rest may be moved manually or in a similar manner against the tension of a spring and suddenly released in order to secure a proper ignition.

The invention consists in certain novel features of construction and arrangement of parts which will be readily understood by reference to the description of the drawings and to the claims to be hereinafter given.

Of the drawings: Figure 1 represents a plan of a portion of a magneto showing devices forming the subject-matter of the present invention applied thereto. Fig. 2 represents a front elevation. Fig. 3 represents a side elevation shown partly in section, and Fig. 4 represents a section on line 4—4 on Fig. 3.

Similar characters designate like parts throughout the several figures of the drawings.

In the drawings, 10 represents a magneto of any well-known construction provided with a suitable armature shaft 11 extending outwardly from the bearing 12 forming a part of said magneto. Loosely mounted upon said shaft 11 is a disk member 13 provided with hubs 14 and 15 having suitable bearings therethrough for the shaft 11, said bearings being connected by suitable arms 16. The hub 15 has keyed thereto a suitable gear 17 by which the armature shaft 11 may be driven from any suitable source of power such as a cam shaft of the engine.

The disk member 13 is provided on its front face with two stops 18 and 19 with which co-acts a radial arm 20 projecting from a hub 21 secured to the armature shaft 11 by means of a stud 22 extending through said shaft 11 and forming a suitable pivot for the member 23 having radial arms 24 extending therefrom, each of said arms being provided on opposite sides of said pivot with a weighted member 25. Normally the end of the radial arm 20 forms a seat for one of the weighted members 25, as shown in Fig. 3, and the member 23 is retained in this position by means of the light spring 26.

Normally when the armature shaft is at rest and when it is revolving at a slow speed the member 23 will be in this position and the ends 27 thereof will be in the same plane as the obstructing device 28, so that as the disk 13 is revolved in the direction of the arrow "*a*" on Fig. 4, the end 27 will come into contact with the obstructing device 28 and further movement of the member 23 in this direction will be prevented, while the disk 13 continues its movement against the tension of the spring 29 interposed between said disk 13 and said radial member 20. The movement of the member 23 will be thus retarded until the pin 19 comes into contact therewith and then the arm 24 will be caused to move with the disk 13, thereby forcing the obstructing device 28 about its pivot 30 against the tension of the springs 31, the tension of which exceeds that of the spring 29. As soon as the obstructing device 28 has been moved about its pivot 30 sufficiently to permit the passage of the arm 24 and release the same, the spring 29 will suddenly act to cause a quick movement of the arm 24 from a position in contact with the pin 19 to its normal position in contact with the pin 18, this increased speed thereby accorded to the armature shaft 11 being sufficient to cause the proper ignition. This movement of the different parts as herein described will continue as long as the shaft is revolved at a normally slow speed

but as soon as the motor begins to be revolved at a speed sufficiently great to insure the proper ignition without this additional movement of the arm 20 between the pins 18 and 19, the weights 25 will, by centrifugal force, move outwardly and cause the ends 27 of the member 23 to be moved out of the path of the obstructing device 28, thereby preventing further action thereon. The shaft 11 and the disk 13 will then continue to revolve in unison with the arm 24 contacting with the pin 18. The throwing out of action of the devices for securing this extra motion during the slow speed is a great advantage as it prevents undue wear of the parts when the operation of these parts is undesired, and it makes it possible to automatically throw the parts into position where they will act as soon as the speed of the motor is again decreased.

The obstructing device 28 is pivoted at 30 to ears 32 projecting from a hub 33 slidable upon a rod 34 mounted in brackets 35 secured at 36 to said magneto. A coiled spring 37 surrounds said rod 34 and retains normally the hub 33 in the position shown in Fig. 4. A cord 38 secured to an arm 39 of the stop 40 and passing around the sheave 41 pivoted to the bracket 35 at 42 is adapted to be operated by means of the ring 43 to move the hub 33 with its stop 40 against the tension of the spring 37 to cause the obstructing device to be moved past the ends 27 of the member 23 when in the position shown in Fig. 4, the stop 40 moving about the pivot 30 in order to accomplish this.

As soon as the operator feels from the movement that the stop 40 has reached its position on the opposite side of the arm 24, he releases his hold on the ring 43 and the spring 37 will act to move the hub 33 again to its seat in the position shown in Fig. 4. In doing this the stop 40 will move the arm 24 about the axis of the shaft 11 against the tension of the spring 29 until it contacts with the pin 19 when further movement in that direction will be prevented and the stop 40 with the bifurcated member 41 in which it is mounted and which in turn is pivoted to the ears 32 by the same pivot 30 will move about said pivot 30 against the tension of the spring 31 to release the member 24 and permit it to be moved suddenly by means of the spring 29 into its opposite position in contact with the pin 18, thereby securing the requisite generation of current to produce a proper ignition.

The mechanism is primarily intended for use upon a motor car and the gear 17 may be geared to the cam shaft of the engine or driven in any other well-known manner. It is a well-known fact that generally the pistons in the various cylinders of a multi-cylinder will, when the engine is stopped, come to a rest in a position ready for an immediate start provided the proper ignition could be at once secured without the necessity of cranking the engine as is usually done. It is to accomplish this desirable object that the obstructing device 28 is made slidable along the rod 34 against the tension of the spring 37 by means of a suitable manually-operated cord 38. It is obvious that this cord may be operated by hand by means of the ring 43 or the cord may be connected to a pedal or other equivalent means and secure the same movement, that is, to place the stop 40 on the opposite side of the arm 24, where it will operate as has been heretofore described. With such a construction as this it is evident that if the pistons in the engine are at the point described the chauffeur would be able to immediately take his place in the car and by operating the cord 38 secure an ignition at once which would cause a starting of the engine the speed of which would gradually increase until a required speed had been gained sufficient to dispense with the additional impetus secured by the movement of the arm 20 between the pins 18 and 19 when the centrifugal mechanism would act to throw the ends 27 out of the path of the obstructing device 28 and thus insure the rotation in unison of the shaft 11 and disk 13. It is quite obvious that it is a great advantage to be able to start the engine in this manner without the labor of cranking and it is also evident that the life of the devices are greatly increased by throwing the parts out of action when their co-action is no longer necessary to secure the proper ignition. Another advantage which the device has is that it provides a ready means for testing or trying out the magneto without putting the operator to the inconvenience and labor of cranking the motor during the operation. This is accomplished by removing a spark plug and placing it in a convenient position where it can be seen, connecting the same in an electric circuit and by then operating the member 33 by means of the cord 28, this operation permitting the sparking of the plug to be readily seen and by the appearance of the spark the exact efficiency of the magneto determined. A further advantage of the mechanism is that when the motor is running slow the sparking will be done later than the same sparking will occur when it is running at a fast rate of speed, the particular advantage of this timing of the sparking being that by securing the spark a little later when the motor is first started all danger of the so called "back kick" which sometimes occurs is entirely obviated.

The difference in the time of sparking is secured as follows: When the motor is running fast the centrifugal devices will have operated to move the ends 27 out of the path of the obstructing device 28 so that the arm

20 will be held by the spring 29 in contact with the pin 18 thus insuring the rotation in unison of the disk 13 and arms 20 and 24. As a result of this unity in rotation the sparking will occur always at the same point as for instance at the point where the pin 18 is indicated in Fig. 4. If, however, the motor is running slow and during a portion of each rotation of the disk 13 the arm 24 and incidentally the shaft 11 are retarded from a forward movement by the obstructing device 28 and the arm 24 is then suddenly released thus permitting the spring 29 to again bring said arm in contact with the pin 18, it is obvious that when this quickened forward movement of the arms 24 and 20 occurs the pin 18 will have reached a position in advance of the position in which it is shown in Fig. 4 and as a result the sparking will be delayed to a greater or less extent or in other words occur a little later in the rotation of the disk 13 than would be the case if the arms 20 and 24 had not been retarded.

While the invention is shown in connection with a high tension magneto it is obvious that it is equally applicable to a low tension magneto and that in the operation of the invention any well-known spark plug may be utilized.

It is believed that the operation and the many advantages of the invention will be thoroughly understood without any further description.

Having thus described my invention, I claim:

1. An actuator for magnetos comprising a revoluble armature shaft provided with a radial arm; a member rotatably mounted on said shaft provided with stops co-acting with said arm to limit the movement of said shaft and member relative to each other; a spring interposed between said arm and said member; a device for temporarily obstructing the movement of said arm on said shaft and again releasing it; and means movable in the plane of the axis of said shaft for automatically effecting the cessation of such obstructing action when said shaft has reached a predetermined speed.

2. An actuator for magnetos comprising a revoluble armature shaft provided with a radial arm; a member rotatably mounted on said shaft provided with stops co-acting with said arm to limit the movement of said shaft and member relative to each other; a spring interposed between said arm and said member; a yielding device for temporarily obstructing the movement of said arm on said shaft and again releasing it; and means movable in the plane of the axis of said shaft for automatically effecting the cessation of such obstructing action when said shaft has reached a predetermined speed.

3. An actuator for magnetos comprising a revoluble armature shaft provided with a radial arm; a member rotatably mounted on said shaft provided with stops co-acting with said arm to limit the movement of said shaft and member relative to each other; a spring interposed between said arm and said member; a yielding device for temporarily obstructing the movement of said arm on said shaft and again releasing it; and centrifugal mechanism revoluble with said shaft and movable in the plane of the axis of said shaft for effecting the cessation of such obstructing action when said shaft has reached a predetermined speed.

4. An actuator for magnetos comprising a revoluble armature shaft provided with a radial arm; a member rotatably mounted on said shaft provided with stops co-acting with said arm to limit the movement of said shaft and member relative to each other; a spring interposed between said arm and said member; a yielding device for temporarily obstructing the movement of said arm on said shaft and again releasing it; and a weighted pivoted member revoluble with said shaft normally in the path of said obstructing device and adapted under increased speed to move in the plane of the axis of said shaft out of the path of said obstructing device.

5. An actuator for magnetos comprising a revoluble armature shaft provided with a radial arm; a member rotatably mounted on said shaft provided with stops co-acting with said arm to limit the movement of said shaft and member relative to each other; a spring interposed between said arm and said member; a yielding device for temporarily obstructing the movement of said arm and again releasing it; a weighted pivoted member revoluble with said shaft normally in the path of said obstructing device and adapted under increased speed to move from said path in the plane of the axis of said shaft; and a spring to retain said weighted member in its normal position.

6. An actuator for magnetos comprising a revoluble armature shaft provided with a radial arm; a member rotatably mounted on said shaft provided with stops co-acting with said arm to limit the movement of said shaft and member relative to each other; a spring interposed between said arm and said member; a device to obstruct temporarily the movement of said arm and again release it; means for moving said device in one direction; and a spring for moving said device in the opposite direction.

7. An actuator for magnetos comprising a revoluble armature shaft provided with a radial arm; a member rotatably mounted on said shaft provided with stops co-acting with said arm to limit the movement of said shaft and member relative to each other; a spring interposed between said arm and said member; a device to obstruct temporarily the movement of said arm and again release it;

means for manually moving said device in one direction; and a spring for moving said device in the opposite direction.

8. An actuator for magnetos comprising a revoluble armature shaft provided with a radial arm; a member rotatably mounted on said shaft provided with stops co-acting with said arm to limit the movement of said shaft and member relative to each other; a spring interposed between said arm and said member; and manually operated means for temporarily obstructing the movement of said arm.

9. An actuator for magnetos comprising a revoluble armature shaft provided with a radial arm; a member rotatably mounted on said shaft provided with stops co-acting with said arm to limit the movement of said shaft and member relative to each other; a spring interposed between said arm and said member; a device in the path of movement of said arm; manually operated means for moving said device into engagement with said arm; and a spring adapted to return said device and release said arm.

10. An actuator for magnetos comprising a revoluble armature shaft provided with a radial arm; a member rotatably mounted on said shaft provided with stops co-acting with said arm to limit the movement of said shaft and member relative to each other; a spring interposed between said arm and said member; a device in the path of movement of said arm; and manually operated means adapted to distend said spring and suddenly release it.

11. An actuator for magnetos comprising a revoluble armature shaft provided with a radial arm; a member rotatably mounted on said shaft provided with stops co-acting with said arm to limit the movement of said shaft and member relative to each other; a spring interposed between said arm and said member; a rod at right angles to said actuator shaft; a member slidable lengthwise thereof in the path of movement of said arm; manually operated means for moving said slide into engagement with said arm; and a spring for moving said member in the opposite direction as soon as released from engagement.

12. An actuator for magnetos comprising a revoluble armature shaft provided with a radial arm; a member rotatably mounted on said shaft provided with stops co-acting with said arm to limit the movement of said shaft and member relative to each other; a spring interposed between said arm and said member; a rod at right angles to said actuator shaft; a member slidable lengthwise thereof in the path of movement of said arm; a pivoted dog thereon; manually operated means for moving said slide into engagement with said arm; and a spring for moving said member in the opposite direction as soon as released from engagement.

13. An actuator for magnetos comprising a revoluble armature shaft provided with a radial arm; a member rotatably mounted on said shaft provided with stops co-acting with said arm to limit the movement of said shaft and member relative to each other; a spring interposed between said arm and said member; a rod at right angles to said actuator shaft; a member slidable lengthwise thereof in the path of movement of said arm; a pivoted dog thereon; manually operated means for moving said slide into engagement with said arm; a spring for moving said member in the opposite direction as soon as released from engagement; and centrifugal means secured to said radial arm adapted to cause a disengagement of said arm and device upon increased speed of said armature shaft.

Signed by me at Boston, Mass., this 25th day of January, A. D. 1907.

HAROLD H. BROWN.

Witnesses:

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WALTER E. LOMBARD.