E. L. PARRIS, Jr.

IGNITION APPARATUS FOR EXPLOSION ENGINES.

APPLICATION FILED MAY 1, 1914.

1,134,058. Patented Mar. 30, 1915.

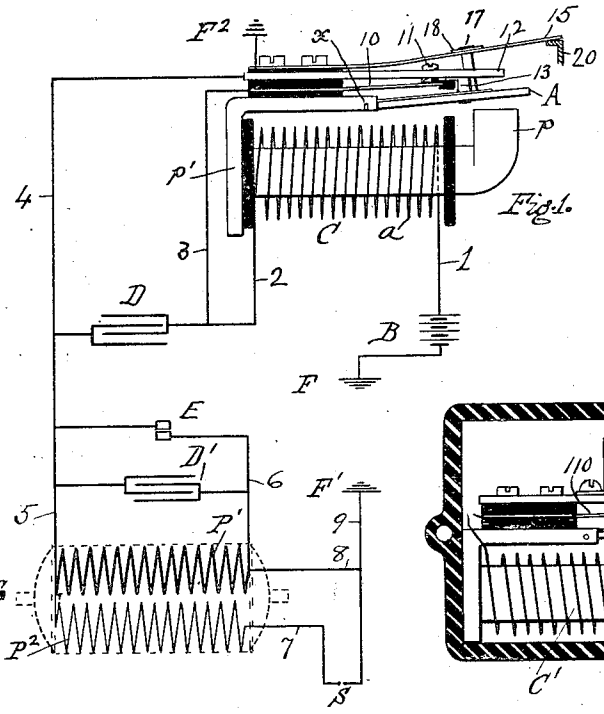


Fig. 1.

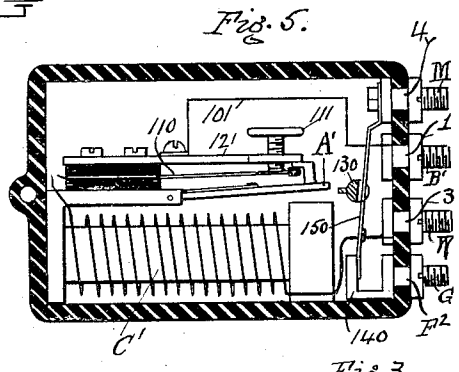


Fig. 5.

Fig. 3.

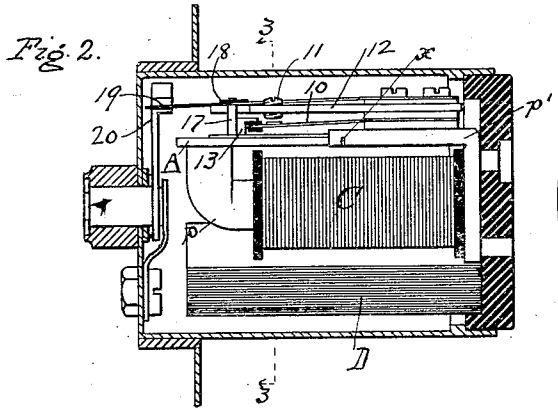
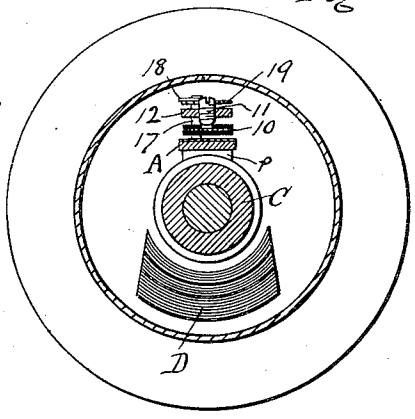


Fig. 2.



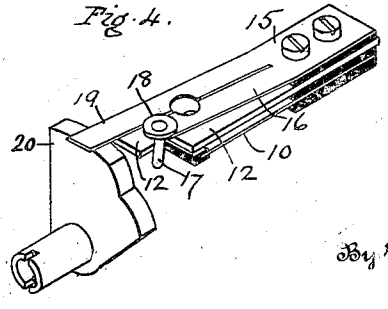


Fig. 4.

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IGNITION APPARATUS FOR EXPLOSION-ENGINES.

1,134,058. Specification of Letters Patent. Patented Mar. 30, 1915.

Application filed May 1, 1914. Serial No. 835,662.

To all whom it may concern:

Be it known that I, EDWARD L. PARRIS, Jr., a citizen of the United States of America, residing in the borough of Manhattan, in the city, county, and State of New York, have invented certain new and useful Improvements in Ignition Apparatus for Explosion-Engines, of which the following is a specification.

My invention relates to ignition apparatus for explosion engines, and the main object of my invention is to provide a simple and efficient means whereby with small battery power the necessary sparking may be provided at the sparking points when the magneto is not operating.

In these drawings I have shown my vibrating electromagnet as combined with an induction means in the form of a magneto having primary and secondary windings on its armature.

In the accompanying drawings, Figure 1 is a diagram illustrative of my invention; Fig. 2 is a longitudinal section through the electromagnetic vibrator box; Fig. 3 is a transverse section through the same on the line 3—3, Fig. 2; Fig. 4 is a perspective view of the switching means; and Fig. 5 shows a modified form of vibrator.

The sparking points S, Fig. 1, may be connected in the usual manner on the one side through a conductor 9 to a ground F^1 and on the other side through a conductor 7 to the high tension secondary winding P^2 of the armature of the magneto G. The low tension primary winding P^1 of this armature is connected on one side through conductors 8 and 9 to the ground F^1 and through the conductor 6 to the circuit breaker E, while on the other side this primary winding P^1 is connected through conductor 5, and the electromagnetic vibrator to the battery B, which is grounded at F. The circuit breaker E is also connected to the conductor 5, and across the conductors 5, 6 is connected the condenser D^1 in parallel with the circuit breaker E of the magneto.

The electromagnetic vibrator comprises an electromagnet C with single low tension winding *a* connected at one end through conductor 1 with the battery and at the other end through the conductors 2, 3 with the spring contact plate 10 carrying near its free end, at the upper side, a platinum contact to make and break connection with an adjustable contact 11 in a fixed arm 12. This arm is connected through the conductor 4 with the conductor 5 leading to the low tension primary winding of the magneto armature.

A condenser D is connected across between conductors 3 and 4, in parallel with the make and break connections between 10 and 11, 12.

The electromagnet is provided with a closed magnetic circuit, and for this purpose the core projecting beyond the coil may have its extended outer end bent up into a pole piece P, while to the other end of the core is attached an L-shaped piece p^1 of iron. To this piece p^1 is pivoted at *x* the armature A to be acted on by the pole piece *p*. This armature A has a connection with the free end of the spring contact plate 10, as by a hook 13 on the armature engaging the outer end of the spring contact with an interposed piece of insulating material. The elasticity of this spring contact plate is such as to constantly tend to come into contact with the contact stop 11, and to raise the armature A at the same time away from the pole *p*. The spring contact plate 10 and the fixed arm 12 may be mounted on the piece p^1 with interposed insulation.

I may use any convenient form of switch to throw the vibrator into and out of action. In Figs. 1, 2, 3 and 4, I have shown the following switching means:—Upon the piece p^1, and over the arm 12, but insulated therefrom, I mount a spring plate 15, which as seen in Fig. 4 is split. One arm, 16, of this plate carries a pin 17 which tends to bear upon the armature A, while a projecting part of this arm, in the form of a washer 18, projects over the other and longer arm 19, Fig. 4, so that whenever this longer arm is raised, the arm 16 will be raised with it. The outer end of the arm 19 rests upon a cam 20 with two acting faces of different heights. By turning this cam to a position with the arm resting upon the highest part of the cam, the arm will be held in the elevated position indicated in Fig. 1, with the armature A raised as shown by the spring contact plate 10. When the cam 20 is turned to bring its lower face under the arm 19, the latter will by its elasticity (being stronger than the contact plate 10) separate plate 10 from pin 11 and so cut out the vibrator. In this position the magneto circuit not being grounded allows the magneto to operate. If cam 20 be turned farther so that the arm 19 of the plate 15 comes in

contact with bar 12, as seen in Fig. 2, the magneto circuit will then be grounded through conductors 5, 4, bar 12, spring plate 15 and ground connection F^2.

If it be desired to provide sparks at S when the magneto is not in operation or is being rotated so slowly as not to give the required current for the purpose, the cam 20 is turned to raise the arms 16, 19 of the plate 15, thereby first breaking the ground connection at F^2 and then allowing the spring plate 10 to rise into contact with contact 11, and at the same time raising the armature A. This closes the battery circuit through the winding of the electromagnet C, conductors 2, 3, plate 10, bar 12, conductors 4, 5, low tension primary winding of magneto armature G, and conductors 8, 9 to ground F^1. The magnet C will instantly attract the armature A to break the circuit again, and the vibrations will continue so long as the plate 15 is kept in the raised position. The result is that they are induced in the secondary windings P^2 of the magneto armature currents which will provide the required sparking at S.

It will be understood that the described operation of the battery can cause sparking at S only when the points E are open, and therefore when the piston of the engine is in position for ignition. On the other hand, since the battery furnishes an intermittent current, it will not injure the points E (the condenser D^1 or primary windings P^1) if the battery be put in operation when those points are closed. Accordingly I use only the usual single circuit breaker E.

In Fig. 5 I have shown a modified construction of vibrator, inclosed in a box of insulating material. In this case, the connections are slightly changed. The wire 1 from the battery is connected through post B^1 and conductor 101 to the stationary plate 121, which carries adjustable contact 111. Against this may contact the vibrator 110, which is electrically connected to one end of the single low tension windings of the electromagnet C^1. The opposite end of the winding is electrically connected to the binding post W, which is connected to wire 3. Opposite this post W stands the body of an elastic switch plate 150, which is mechanically and electrically connected to binding post M, connected through wire 4 to the magneto. The free end of this elastic plate 150 normally tends to assume the position shown in Fig. 5 and in contact with the backstop 140, which is connected to ground F^2 through a binding post G. Against the back of the spring plate 150 may work a cam or key 130, as shown. With the switch in the position illustrated, the magneto is grounded at F^2 and the battery cut out. If a quarter turn be given to key 130, the ground connection at F^2 will be broken, but the battery will still be out of circuit. By giving to the key 130 a half turn from the position shown, the spring plate 150 will be pressed into electrical contact with post W and the battery circuit closed through the coils of the electromagnet C^1, causing the armature A^1 and spring 110 to vibrate, as in Fig. 1.

I claim as my invention:

1. An ignition apparatus, comprising a magneto with primary and secondary windings on its armature and a single circuit breaker, in combination with an electromagnetic vibrator and battery and means for connecting the battery and coil of the electromagnet of the vibrator in series with the primary of the magneto, for the purpose set forth.

2. An ignition apparatus, comprising a magneto with primary and secondary windings on its armature and a single circuit breaker in combination with an electromagnetic vibrator, battery and condenser, and means for connecting them up through the low tension primary winding of the magneto, for the purpose set forth.

3. An ignition apparatus, comprising a magneto with primary and secondary windings on its armature and a single circuit breaker in combination with an electromagnetic vibrator, battery and condenser, the electromagnet having a single low tension winding, and means for connecting up the vibrator, battery and condenser through the low tension primary winding of the magneto, for the purpose set forth.

4. An ignition apparatus, comprising a magneto with primary and secondary windings on its armature, and a single circuit breaker in combination with an electromagnetic vibrator having a closed magnetic field, a condenser and battery, and means for connecting these up through the low tension primary of the magneto, for the purpose described.

5. An ignition apparatus, having an electromagnetic vibrator with an armature, spring contact plate and fixed contact stop in combination with a spring plate and cam to throw the contact plate out of action.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

EDWARD L. PARRIS, Jr.

Witnesses:
WALTER ABBE,
ADA E. POWELL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."