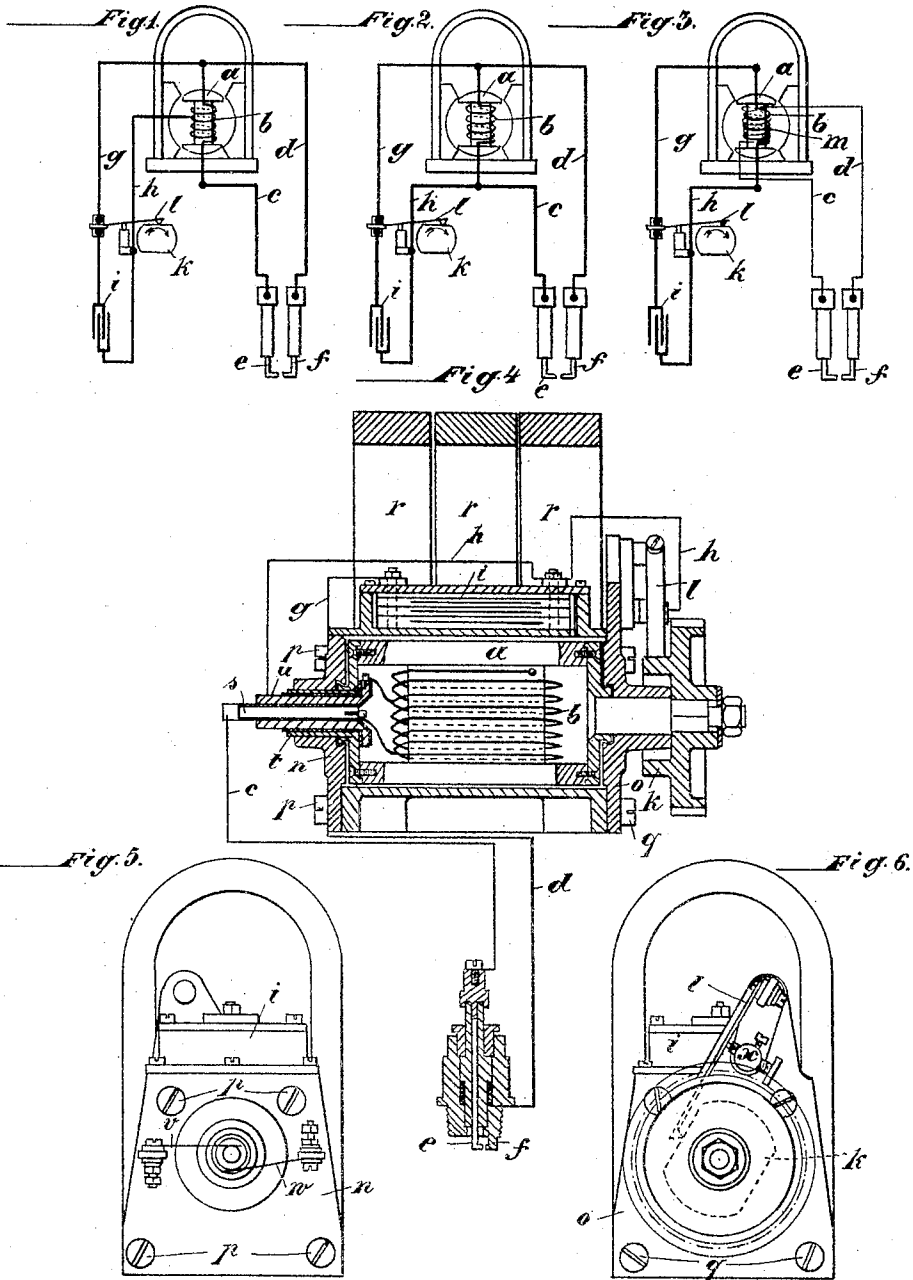


G. HONOLD.

MAGNETO ELECTRIC IGNITION APPARATUS FOR EXPLOSION ENGINES.

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Witnesses:

M. C. Massie.
Anton Eberhart.

Inventor:
Gottlob Honold
by Max Georgii
his Attorney

UNITED STATES PATENT OFFICE.

GOTTLÖB HONOLD, OF STUTTGART, GERMANY, ASSIGNOR TO ROBERT BOSCH, OF STUTTGART, GERMANY.

MAGNETO-ELECTRIC IGNITION APPARATUS FOR EXPLOSION-ENGINES.

No. 802,291.

Specification of Letters Patent.

Patented Oct. 17, 1905.

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To all whom it may concern:

Be it known that I, GOTTLÖB HONOLD, engineer, of Hoppenlaustrasse 11, Stuttgart, Germany, have invented certain new and useful Improvements in Magneto-Electric Ignition Apparatus for Explosion-Engines, of which the following is a full, clear, and exact description.

The magneto-electric ignition apparatus for explosion-engines which forms the object of the present invention is characterized by the arrangement that by interrupting the short-circuited armature-coil or a part thereof the potential induced in the coil rises so high that a small voltaic arc effecting the ignition is formed between two contact-pieces which are joined to the ends of the armature-coil and inserted insulated from each other in the usual manner in the interior of the cylinder.

In the accompanying drawings, Figure 1 shows diagrammatically an apparatus of this kind with partial short circuit; Fig. 2, the same with complete short circuit. Fig. 3 is a modification with two coils separated from each other. Fig. 4 illustrates in longitudinal section, by way of example, a form of construction of an apparatus of this kind. Fig. 5 is a front view thereof, and Fig. 6 an end view.

To the coil *b* (short-circuited at any spot preferred) of the revoluble armature *a* are joined by the wire *cd* two contact-pieces *ef*, forming the usual ignition-candle, which are insulated from one another in the usual manner and inserted in the interior of the cylinder of the gas-engine. In the wire *gh* is interpolated, on the one hand, a condenser *i* and, on the other hand, the circuit-breaker *l*, which is operated by the cam *k* or by other suitable means. When the armature is set in rotation, an electromotive force is induced in the coil by the action of the field-magnet. If now the coil is partially (as in Fig. 1) or entirely (as in Fig. 2) short-circuited, the current flowing in the short-circuited winding generates lines of magnetic force in the armature, which neutralize existing magnetic field—that is, they force back, so to speak, the existing lines of force. As soon as the circuit is opened or broken the counter action of the lines of force generated in the ar-

mature ceases. Owing to the change which thereby instantaneously arises in the amount of the lines of force, the potential rises so high in the armature-winding that a small voltaic arc forms between the contact-pieces *ef* of the candle, which effects the ignition of the explosive mixture in a very intense manner. The condenser *i*, which is switched in parallel to the interruption-point, is for the purpose of breaking the circuit as quickly as possible.

Instead of one coil there may also be two, *b m*, Fig. 3, divided from each other, one of which is employed for breaking the circuit, while the high potential is generated in the other.

In order to show the parts clearly, in Figs. 1 to 3 the condenser and the circuit-breaker are placed outside the apparatus; but it is obvious that in practice these parts are in direct connection with the apparatus, the latter thus being very compact.

A form of construction of this device is illustrated in Figs. 4 to 6, in which the armature *a* is pivotally placed between the two front plates *no*, which are attached by screws *p q* to the magnets *r*. The winding *b* of the armature is connected, on the one hand, with the axle *s* and, on the other hand, with a sleeve *u*, which is insulated both from the axle and from the sliding sleeve *t*. The current is taken from the axle *s* by the brushes *v*, Fig. 5, and connected, by means of the wire *c*, with the contact-piece *e*, while the piece *f* is in connection with the body of the apparatus by means of wire *d* and screw *p*. The second brush *w*, Fig. 5, slides on the sleeve *u* and conducts the current by means of the wire *h* into the condenser *i*, arranged in the interior of the apparatus, from whence it passes through the intermediate piece *x* into the circuit-breaker *l*, Fig. 6. The condenser *i* is connected with the body of the apparatus by means of the wire *g*. The method of operation of this apparatus is exactly the same as that described above.

The apparatus is, of course, adapted in the same manner for oscillating motion of the armature as well as rotary motion.

What I claim, and desire to secure by Letters Patent, is—

In an ignition device for explosion-engines, the combination, with a generator having a

revoluble armature provided with two wind-
ings in inductive relation to each other, of a
pair of spark-electrodes, a circuit in which
said electrodes and one of the armature-wind-
ings are included, a short circuit in which the
5 other armature-winding is included, a con-
denser connected to said short circuit, and
means operating synchronously with the rev-

oluble armature of the generator and serving
to open and close the short circuit. 10

In witness whereof I have hereunto set my
hand in presence of two witnesses.

GOTTLOB HONOLD.

Witnesses:

KARL BOSCH,
ERNST ENTENMAN.