No. 772,649. PATENTED OCT. 18, 1904.

E. EISEMANN.

SPARKING IGNITER.

APPLICATION FILED APR. 12, 1902.

NO MODEL.

Fig. 2.

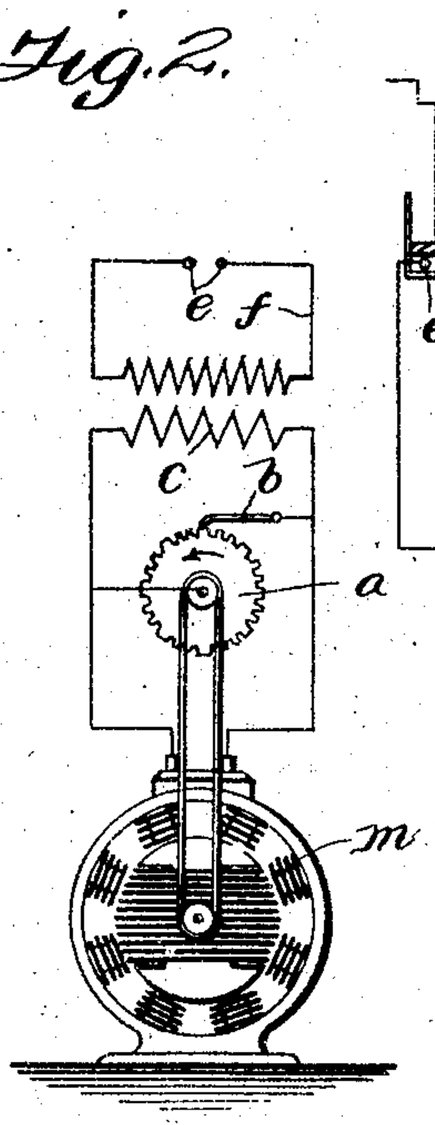


Fig. 3.

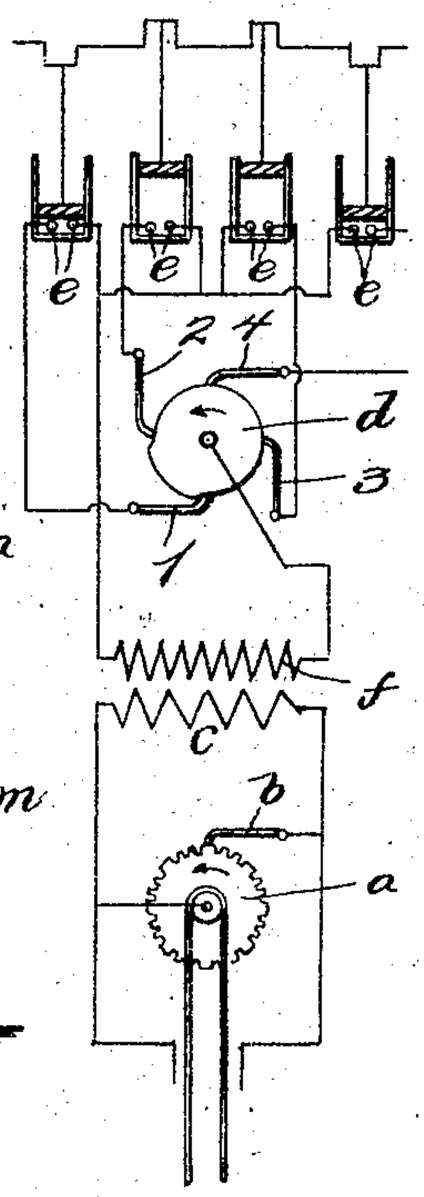
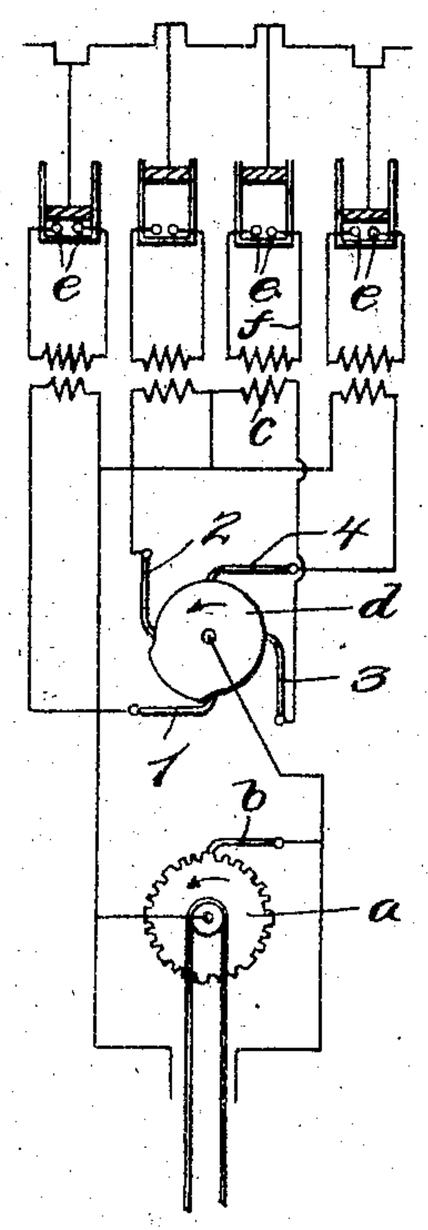


Fig 4



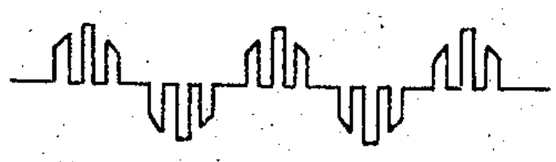


Fig. 1.

Witnesses

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UNITED STATES PATENT OFFICE.

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SPARKING IGNITER.

SPECIFICATION forming part of Letters Patent No. 772,649, dated October 18, 1904.

Application filed April 12, 1902. Serial No. 102,613. (No model.)

To all whom it may concern:

Be it known that I, ERNST EISEMANN, a citizen of the German Empire, residing at Stuttgart, in the Kingdom of Würtemberg, Germany, have invented certain new and useful Improvements in Sparking Igniters, of which the following is a description, reference being had to the accompanying drawings and to the letters and figures of reference marked thereon.

In the devices hitherto employed for producing a stream of electric sparks there is employed either the rapid interruption of a constant current flowing in the primary circuit of an induction-coil or the interrupted discharge of a condenser by means of this primary coil. The direct transformation of alternating current of low potential into similar currents of higher potential can also be employed.

Now the arrangement which forms the object of the present invention is intended to produce a longer stream of sparks in the secondary circuit of an induction-coil by the use of a current-producer of high self-induction and by the introduction into the primary circuit of an induction-coil with means, as hereinafter referred to, by which the induced currents therein produced by periodic current fluctuations are of higher potential than is attainable by the mere breaking and making of the primary circuit.

To this end the invention consists in the matters hereinafter described, and referred to in the appended claims.

The arrangement will now be described with reference to the accompanying drawings, in which—

Figure 1 is a diagram of the current-curve resulting in the primary coil of the induction-coil when an alternating current is used. Fig. 2 shows the arrangement in use with an alternating-current generator. Figs. 3 and 4 show a means for igniting the explosive mixture in multicylinder power-engines, the sparking currents being conveyed to the separate cylinders by means of a contact-wheel and contact-springs rubbing on the same.

A synchronously-running contact-disk *a* is connected with the current-producer *m*, which is of high self-induction. A spring *b* rubs on the contact-disk *a*, which spring periodically short-circuits the current-producer *m* by the rotation of the contact-disk and in similar manner switches in or out the primary coil *c* of an induction-coil connected with the current-producer. On each interruption of the short circuit set up by the spring *b* there passes through the coil *c*, in addition to the current of the producer *m*, an extra quantity of current resulting from the cessation of the short circuit, this current being in the same direction, so that it is added to the former. The consequence is the formation of an induced current of considerable potential in the secondary circuit *f* of the induction-coil, which causes sparks to pass across between the sparking points *e*.

In using alternating-current generators the division of the contact-disk *a* coincides with the number of changes of polarity, and it is also preferable that the short-circuit piece lying at the zero of the current-curve in the contact-disk *a* should be made somewhat broader than the others. The stream of sparks hereinbefore described for igniting explosive mixtures in power-engines may be produced in the construction shown in Figs. 3 and 4 by the use of a contact-wheel *d*, running synchronously with the contact-disk *a*, and a number of circuit-closing springs 1 2 3 4, corresponding to the number of cylinders, by means of which springs the switching on and off of the sparking current at the separate cylinders is effected at the same times that the primary circuit of the induction-coil is short-circuited by the contact-disk *a* and spring *b*, the coil being thus rendered void of current with the object of avoiding sparking at the place of contact.

Thus, as shown in Fig. 3, the secondary or, as shown in Fig. 4, the primary circuit may be switched in or cut out. In the latter case a number of induction-coils must be employed corresponding to the number of cylinders.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. An igniter for explosive-engines and the like, comprising a current-producer of high self-induction, a contact-disk running syn-

chronously therewith and in a short circuit with the same, an induction-coil of which the primary coil is connected with the current-producer and in circuit with the contact-disk, and means for periodically opening the short circuit between the current-producer and the contact-disk, and causing the entire current to flow through the primary coil, the secondary coil being connected with sparking points; substantially as described.

2. In explosive-engines having a plurality of explosive-cylinders, an igniter therefor comprising a current-producer of high self-induction, a contact-disk running synchronously therewith, an induction-coil of which the primary coil is connected with the current-producer and in circuit with the contact-disk, and means for periodically opening the circuit between the current-producer and the contact-disk and causing the current to flow through the primary coil, the secondary coil being connected with sparking points, and a contact-wheel running synchronously with the contact-disk and having a plurality of circuit-closing springs corresponding to the number of explosive-cylinders; substantially as desired.

3. An igniter for explosive-engines and the like, comprising a current-producer, an induction-coil composed of primary and secondary coils, one of which is connected with the current-producer, and means for causing periodic fluctuations in the amount of current supplied to the induction-coil, said means including a notched contact-disk running synchronously with the current-producer, and a contact-spring engaging said disk; substantially as described.

4. An igniter for explosive-engines and the like, comprising a current-producer, an induction-coil composed of primary and secondary coils, one of which is connected with the current-producer, and means for causing periodic fluctuations in the amount of current supplied to the induction-coil, said means including a notched contact-disk running synchronously with the current-producer, and a contact-spring engaging said disk and a second contact-disk running synchronously with the first and having a series of contact-springs corresponding with the number of explosive-cylinders; substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ERNST EISEMANN.

Witnesses:

AUGUST DRAUTZ,

WALTER SCHWAEBREL.