

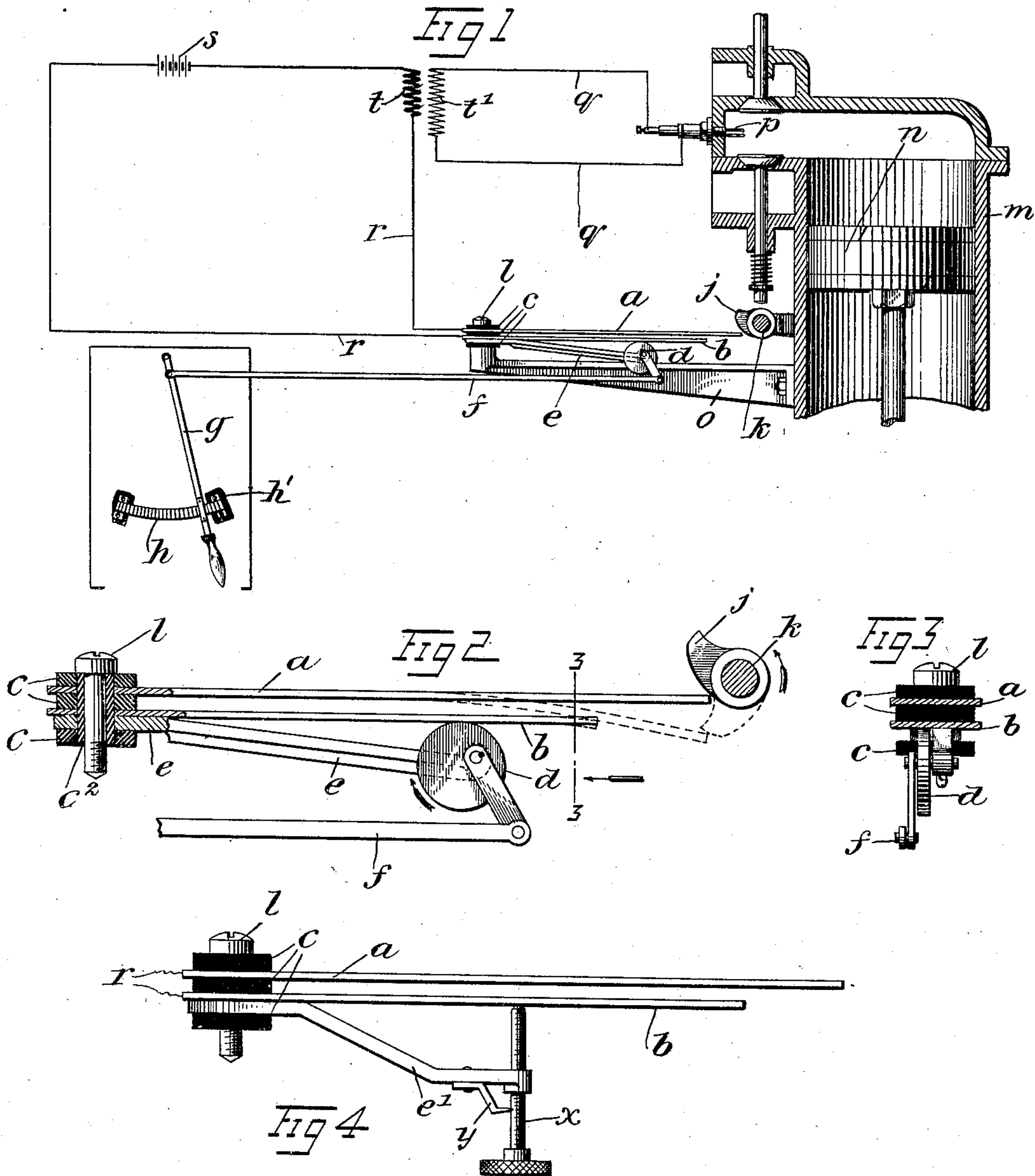
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G. A. ELSASSER, JR. & P. M. ELSASSER.

SPARK TIMING DEVICE.

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SPARK-TIMING DEVICE.

No. 795,497.

Specification of Letters Patent.

Patented July 25, 1905.

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To all whom it may concern:

Be it known that we, GEORGE ALFRED ELSASSER, Jr., and PAUL MARK ELSASSER, citizens of the United States, and residents of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and Improved Spark-Timing Device, of which the following is a full, clear, and exact description.

Our invention relates to a device for timing the electric igniting spark in gas-engines and the like.

The objects of our invention are to secure in devices of this character simplicity of operation and construction, accuracy in timing, accurate and simple adjustment, small cost of production, compactness, wide range of speeds, and ready adaptability for all kinds of gas, gasoline, and all other explosion engines employing the electric jump-spark for the ignition of gas.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional view of certain parts of a gas-engine with one form of our invention attached and shown in elevation. Fig. 2 is an enlarged view of certain parts shown in Fig. 1, portions thereof being in section. Fig. 3 is a sectional view on the line 3-3 of Fig. 2, and Fig. 4 is a view similar to Fig. 2 of another form of our invention.

Our invention comprises a pair of bars *a* *b*, made of spring-brass or other metal and entirely insulated from each other at their supporting ends by the fiber or other insulating washers *c* and the bushing *c*², formed of similar material. They are fastened together by means of a bolt *l* passing through the bushing *c*². One of the bars, preferably the upper one, *a*, is made longer than the other for a purpose to be described. The lower bar *b* is designed to be adjusted up and down. In Figs. 1, 2, 3 a cam *d* is shown for this purpose attached to an arm *e*, which is shown as secured in position relative to the bar *b* by means of the bolt *l*. The cam is designed in this instance to be operated by a connecting-link *f* and hand-lever *g*, which is designed to move over a ratchet *h*, adapted to hold it in any desired position. The ratchet is carefully insulated from the ground by plates or supports *h'*. A shaft *k* is designed to rotate continuously while the engine is moving and car-

ries a cam *j*. As shown in Figs. 1 and 2, this cam is adapted to press upon the bar *a* and bring it down into contact with the bar *b*, thereby forming an electrical connection through the battery *s* and the primary *t* of the induction-coil through wires *r* *r*, which causes a current to pass through the secondary *t'*, wires *q* *q*, and spark-plug *p*.

m represents a gas-engine cylinder of any construction, and *n* a piston working therein.

o is a bracket attached to the cylinder or other desired part of the gas-engine, and to this the bars *a* *b* are secured by means of the bolt *l*.

In the construction shown in Fig. 4 the parts *a*, *b*, *c*, and *l* are the same as those described above. In place of the arm *e*, however, an arm *e'* of modified construction is used, having a screw-threaded end in which turns a thumb-screw *x*. Upon the arm *e'* is a piece of spring-brass or other material *y*, having a sharpened end fitting in the thread of the screw *x* and adapted to hold it in any desired position.

The operation of this device is very simple. The bar *b* may be adjusted by means of the cam *d* or the screw *x* in any desired position with respect to the bar *a*. The bar *b* is formed of spring metal and so fixed as to bear downwardly upon the cam *d* or screw *x* in the lowest position thereof. Therefore when these adjusting devices are operated to raise the bar *b* it will be forced upwardly toward the bar *a*, and the distance between them being lessened the time of the spark will be correspondingly regulated. The time is varied as follows: The two bars *a* and *b* are normally about a quarter of an inch apart. When the cam *j* bends the bar *a* into contact with the bar *b*, it immediately closes the primary circuit through the wires *r*, which will cause the current from the battery *s* to flow through the primary coil *t* of the induction-coil, and this in turn will excite the secondary coil *t'*, which will cause a spark to be produced in the cylinder by means of the spark-plug. It is thus seen that as soon as the bar *a* comes into contact with the bar *b* a spark is produced in the cylinder. Now if the bar *b* is moved up nearer the bar *a* the latter when bent down by the cam *j* will come into contact with the former at an earlier time and the spark will occur sooner, making the explosion earlier and increasing the speed of the engine.

It is obvious that other adjusting devices

may be employed than those shown, and we do not wish to limit our invention to the particular forms shown.

The device shown in Figs. 1, 2, and 3 is designed especially for all engines other than stationary ones; but in stationary engines the simpler device (shown in Fig. 4) may be used.

The shaft k does not have to be an additional feature of the machine, but may be a shaft used to operate a valve or other part of the engine.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a timing device, the combination of a spark-plug, a bar, a second bar formed of spring material and insulated from the first bar, an induction-coil, electric connections between the induction-coil and said bars, electric connections between the induction-coil and the spark-plug, a cam for forcing one bar toward the other and adjusting the distance between them, and means for bringing the two bars into contact.

2. In a timing device, the combination of a spark-plug, a pair of bars formed of spring material, one of said bars being longer than the

other, means for supporting said bars near one end, means for insulating said bars from each other and from their support, electrical connections from said spark-plug to each of said bars, means for adjusting the free end of the short bar to and from the other, means for holding said adjusting means in adjusted positions, and additional means for temporarily forcing the longer bar into contact with the shorter bar.

3. The combination of a spark-plug, electric connections thereto, a pair of spring-bars insulated from each other, each one joined to said electrical connections, a cam for adjusting one of said bars toward and from the other, means for forcing said bars into contact with each other, and means for holding said adjusting-cam in a desired position.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GEORGE A. ELSASSER, JR.
PAUL M. ELSASSER.

Witnesses:

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