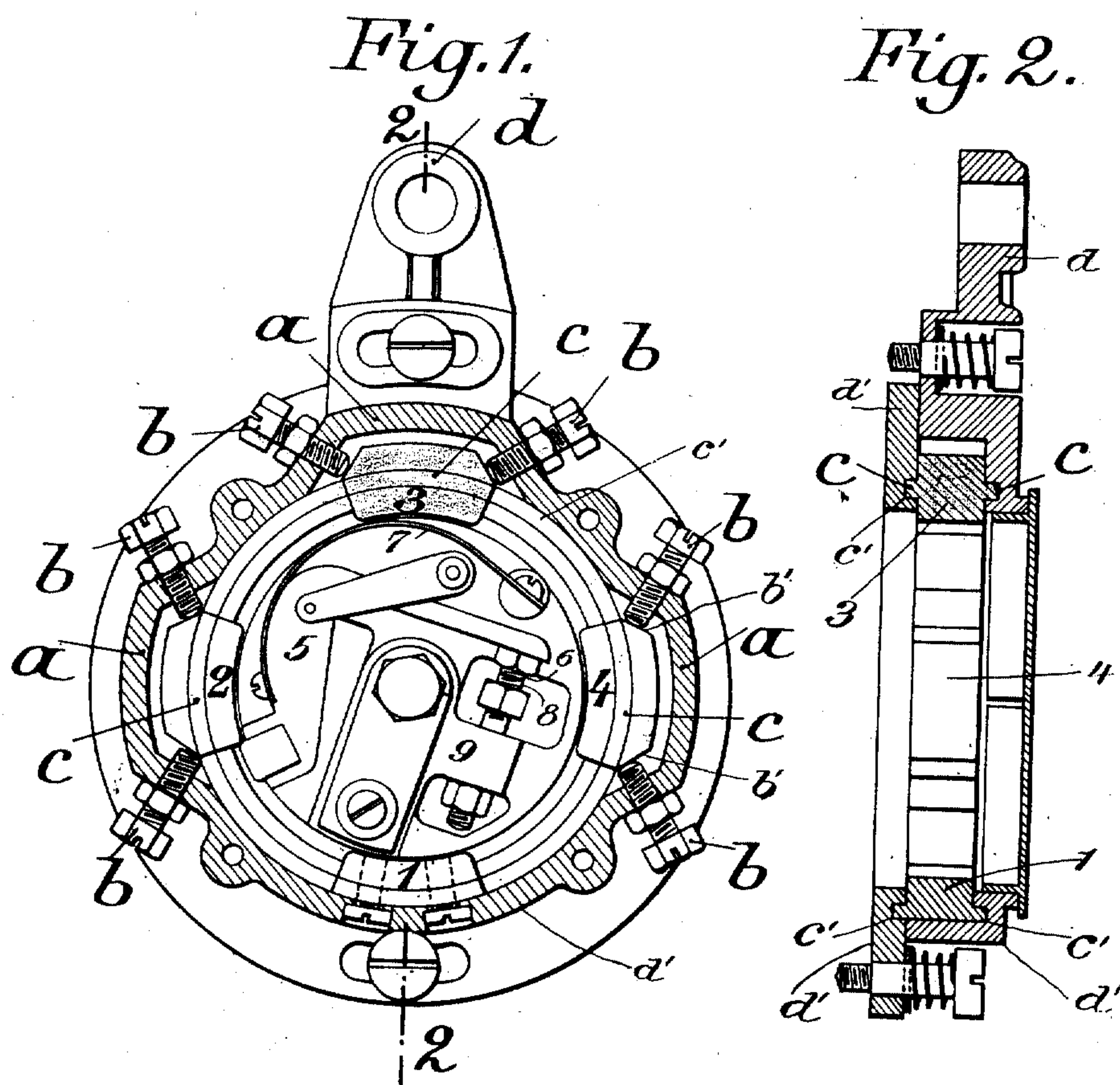


G. HONOLD.
 APPARATUS FOR THE ELECTRIC IGNITION OF LARGE INTERNAL COMBUSTION ENGINES.
 APPLICATION FILED APR. 7, 1908.

995,676.

Patented June 20, 1911.



WITNESSES

E. C. Hedstrand
M. B. Taylor.

INVENTOR
Gottlob Honold
by Georgii & Masnie
 his ATTORNEYS

UNITED STATES PATENT OFFICE.

GOTTLOB HONOLD, OF STUTTGART, GERMANY.

APPARATUS FOR THE ELECTRIC IGNITION OF LARGE INTERNAL-COMBUSTION ENGINES.

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Specification of Letters Patent. Patented June 20, 1911.

Application filed April 7, 1908. Serial No. 425,765.

To all whom it may concern:

Be it known that I, GOTTLOB HONOLD, engineer, a subject of the German Emperor, residing at 11 Hoppenlaustrasse, Stuttgart, Germany, have invented certain new and useful Improvements in Apparatus for the Electric Ignition of Large Internal-Combustion Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In large internal combustion engines, the smaller the number of revolutions and the larger the volume of the cylinder the greater is the difficulty of obtaining an exact ignition, which, nevertheless, is of particular importance to the efficiency of the engine. Whereas in a quickly running engine the operation of the interrupter lever for each separate ignition is almost momentary, this operation becomes more prolonged in larger and less rapidly running engines, so that differences may occur ordinarily in the intervals of time between the ignition in successive working cycles and the efficiency of the engine be thereby reduced. When stationary cam surfaces are used for operating the interrupter lever, a supplementary adjustment of the distributor parts is extremely difficult and, moreover, can only be effected during intervals in running and thus with uncertain results.

The present invention relates to a construction whereby the cam surfaces or their equivalents, on which the time of ignition depends, are relatively adjustable and adapted to be fixed in any desired position, the construction being such that the ignition in each cylinder of the engine may be adjusted during running and with any desired degree of accuracy. The construction does not prevent the general adjustment of the time of ignition of the whole engine, which may be arranged in the manner heretofore usual.

In the accompanying drawings Figure 1 is a sectional elevation of an interrupter having the improvements according to this invention, and Fig. 2 is a section on line 2—2 of Fig. 1.

Of the cam blocks or trips 1, 2, 3 and 4 one, 1, is rigidly fixed to the ring of the

adjusting lever d while the others can be displaced a certain distance along the circumference upon which they lie. For this purpose cavities a are provided in the ring d' of the adjusting lever, wherein the cam blocks are situated and have the necessary play; into each cavity extends a pair of set screws b, b . The set screws of each pair have their inner ends turned toward each other, which ends bear upon inner inclined faces b' on the trip or cam block so that by adjusting the screws the block can not only be shifted along the circumference but be pressed firmly inward and maintained in the new position by locking the screws. For guiding the cam blocks there are two annular grooves c' arranged one in each side member of the ring of the adjusting lever to receive the lateral flanges c, c on the block so that the latter cannot be radially shifted even if the set screws be loose. Each of the cam blocks can thus be adjusted without trouble while running, by simultaneously adjusting both screws, that is, unscrewing one as much as the other is screwed up, so that the cam block always remains held between the two screws. For the general adjustment of the time of ignition there is the usual lever d by which the whole ring can be turned.

The cam blocks project into the path of one end of an interrupter lever, 5, which carries a contact point, 6, at its inner end and is normally held in such a position by a spring, 7, that the outer end of the lever will ride upon the cam blocks in the travel of the lever and the contact point, 6, will bear against a contact point, 8, mounted in a block, 9, which is caused to travel in a circular path with the interrupter lever by the armature shaft of a magneto generator. It will be understood that the circuit is closed as long as the contact points 6 and 8 are together but as the parts travel around the ring d' the end of the lever 5 will be brought against the cam blocks and thereby forced inward so as to draw the point 6 away from the point 8 and consequently break or interrupt the circuit. As the ignition circuit is controlled by the circuit through the points 6 and 8, it will be seen that the time of ignition or the interval between succes-

sive explosions may be easily and accurately controlled by adjusting the cam blocks, as described.

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

1. Apparatus for the electric ignition of large internal combustion engines comprising a rotary interrupter lever, normally stationary cam blocks adapted to engage and trip the said rotary lever, and means for adjusting the said cam blocks relatively to each other along the path of the interrupter lever.

2. Apparatus for the electric ignition of large internal combustion engines comprising a rotary interrupter lever, normally stationary cam blocks adapted to engage and trip the said rotary lever, a ring surrounding the said rotary lever and having a number of cavities to receive the cam blocks, means for guiding the said cam blocks on the circumference of a circle inclosed by the ring, and means for shifting the cam blocks along the said circumference in their respective cavities.

3. Apparatus for the electric ignition of large internal combustion engines comprising a rotary interrupter lever, normally stationary cam blocks adapted to engage and trip the said rotary lever, a ring surrounding the said rotary lever and having a num-

ber of cavities to receive the blocks, annular grooves in the said ring, flanges on the said cam blocks engaging in the said grooves and a pair of inclined screws extending into each of the said cavities and bearing against the cam block therein.

4. Apparatus for controlling ignition in gas engines, comprising an interrupter lever, a series of trips arranged to engage said lever, means for causing relative movement of the trips and the lever, and means for adjusting the trips with respect to each other.

5. In an interrupter for magneto ignition devices, an interrupter lever, a ring surrounding the lever, a plurality of trips mounted in the ring, one of the trips fixed in its relation to the ring and the other trips adjustably mounted thereon, means to cause relative rotary movement of the ring and lever, means to adjust the ring with the fixed trip angularly, and means to adjust the other trips in the ring independently of each other and of the fixed trip.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

GOTTLOB HONOLD.

Witnesses:

REINHOLD ELWERT,
ERNST ULMER.

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