G. HONOLD.

CONTACT BREAKER FOR ELECTRICAL IGNITION APPARATUS FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED JULY 19, 1907.

1,041,476. Patented Oct. 15, 1912.

Fig. 1.

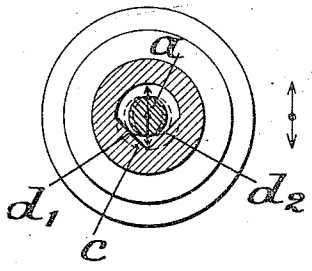


Fig. 2.

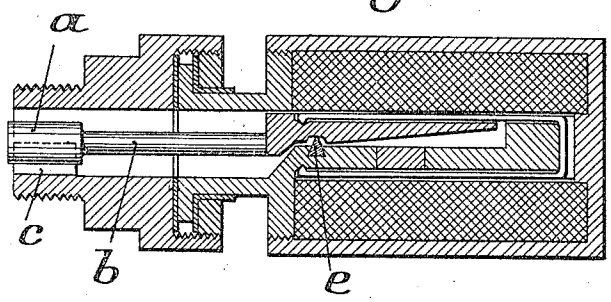


Fig. 3.

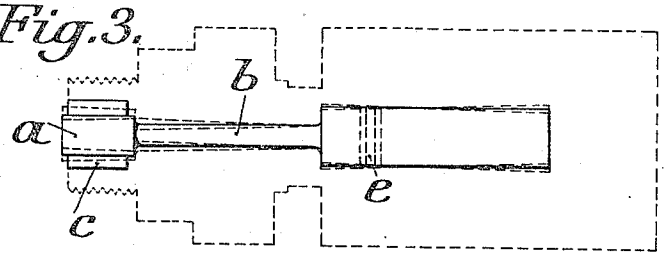


Fig. 4.

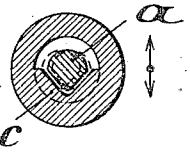


Fig. 5.

Fig. 6.

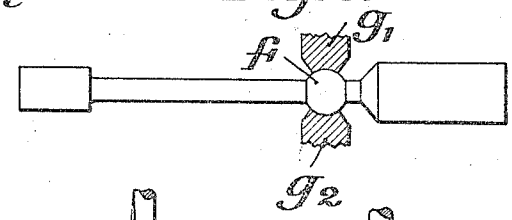


Fig. 7.

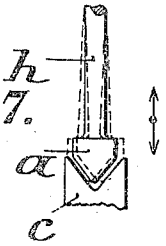
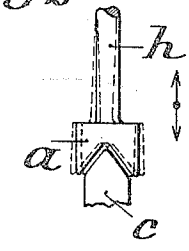


Fig. 8.



WITNESSES

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CONTACT-BREAKER FOR ELECTRICAL IGNITION APPARATUS FOR INTERNAL-COMBUSTION ENGINES.

1,041,476. Specification of Letters Patent. Patented Oct. 15, 1912.

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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 Contact-Breakers for Electrical Ignition Apparatus for 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 apperta ns to make and use the same.

In contact-breakers for electrical ignition apparatus for internal combustion engines it may happen that a large particle of some badly conducting material, such as a particle of the residue left by the combustion, a particle of carbonized oil or of a metallic oxid, is deposited between the surfaces of the contact pieces thus preventing electrically conducting contact and the production of a spark until the obstruction has been removed by the mechanical vibration. Sliding contacts would keep themselves clean, but the friction which they involve renders them unsatisfactory.

The present invention consists of a contact-breaker which combines the advantages of the usual system and of sliding contacts while avoiding the aforesaid objections to them.

In the accompanying drawings Figure 1 is a transverse section, Fig. 2 a side elevation and Fig. 3 a plan of a contact-breaker constructed according to the invention. Figs. 4 and 5 are cross sections showing modifications. Fig. 6 shows a modification of the fulcrum of the lever carrying one of the contact pieces, and Figs. 7 and 8 are part elevations showing further modifications of the contact pieces.

Referring to Figs. 1–3 under normal conditions the head a of the lever b, which oscillates as indicated by the arrows, lies in one of its extreme positions, symmetrically on the two inclined surfaces of the support c and makes with each an electrical contact at d' d^2 respectively, devoid of friction. The lever b, however, in addition to the oscillatory movement to and from the support c, due to its actuating magnet, is adapted to oscillate independently in a plane at right angles to that in which the said to and fro movement occurs, the fulcrum e being suitably constructed for the purpose. This oscillation is indicated in Fig. 1 by the dotted extreme positions of the head a. If one of the contact surfaces, such as d', has become useless owing to the deposition of an obstructing particle, the head a, as it moves toward the surfaces, is turned a little by the obstruction so that it comes against the surface d^2 at a place different from that which it normally touches, such as, for instance, is indicated in dotted lines at d^2; the necessary contact is thus made exclusively at this place. At the same time, owing to the frequently repeated sliding movement of the head over the obstruction, the latter is removed after a short time and the circuit is again closed at both contact surfaces d' d^2. The same conditions prevail if the contact surface d^2 becomes dirty. The advantage of the arrangement rests in the fact that it affords a reserve contact, since it is exceedingly unlikely that both contact surfaces will be dirtied at the same time. A further advantage is that the dirty surface is automatically cleaned by a sliding movement accompanied by an extremely small loss due to friction because it does not occur under stress or from the position of rest.

As shown in Fig. 4, the head a may have inclined surfaces corresponding with those of the support c, and as shown in Fig. 5, instead of the inclined surfaces of the head engaging between those of the support c, the surfaces of the latter may engage between those of the former.

In Fig. 2 the fulcrum of the lever is a knife edge e engaging in a rather wide cavity in the lever; but the fulcrum may be of any other suitable kind such as a ball f (Fig. 6) resting in two spherically formed cavities in supports g' g^2. This manner of mounting the lever permits its movement in the four principal directions.

The invention is also applicable to a reciprocating contact-breaker, as illustrated in Figs. 7 and 8, provided that the guide rod h is allowed sufficient lateral play to permit of the effect described above.

Further modifications are possible, if they allow the purpose of the invention to be achieved.

Having thus fully described my invention, what I claim is:—

1. In contact breakers for electric igniters, the combination of two contact members,

one having a cavity with outwardly diverging unitary walls and the other having a head to enter the cavity, the members mounted for movement one toward the other and also pivotally for relative lateral movement.

2. In contact breakers for electric igniters, the combination with a unitary contact member having a cavity with outwardly diverging walls, of a contacting member provided with a head to enter the cavity, one of the members pivoted for a normal contact breaking movement to and from the other member and also for lateral movement relative to the normal movement.

3. In contact breakers for electric igniters, the combination, with a fixed contact member having a cavity with outwardly unitary diverging walls, of a contacting member provided with a head formed to enter said cavity, one of the members mounted in a bearing to move pivotally to and from the other member, said bearing arranged to permit of movement of the member laterally relatively to the normal movement.

4. In contact breakers for electric igniters the combination with a fixed unitary contact member having a wedge shaped cavity, of a contacting member provided with a head formed so as to fit into said cavity, said member being mounted in a bearing permitting lateral pivotal play relatively to the normal movement.

5. In contact breakers for electric igniters the combination with a fixed contact member having a wedge shaped cavity, of a contacting member provided with a wedge shaped head adapted to enter said cavity and also with a bearing groove for a fulcrum, said member being pivoted on the fulcrum and having lateral play in the bearing groove relatively to the normal movement.

6. In contact breakers for igniters, the combination of a contact member and a contacting member, one provided with a wedge-shaped cavity and the other with a head arranged to enter said cavity, the contacting member mounted for pivotal movement in two directions at an angle to each other, one to and from the contact member and the other laterally of such to and fro movement.

7. In contact breakers for igniters, the combination of an undivided contact piece having a wedge-shaped cavity, of a contacting member having a head adapted to enter said cavity, a knife edge fulcrum, one of the members having a transverse bearing groove and pivoted on the knife edge fulcrum to move to and from the other member, the groove formed to provide lateral movement of the member on the fulcrum relatively to the normal pivoted movement.

8. In an igniter, the combination, with a stationary electrode, of a movable electrode mounted for movement in two directions transverse to each other, one of said electrodes having a cavity with outward diverging walls and the other electrode having a head formed to enter said cavity and contact with either or both of said walls.

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

GOTTLOB HONOLD.

Witnesses:
ERNEST ENTENMANN,
RUDOLF KLEIN.