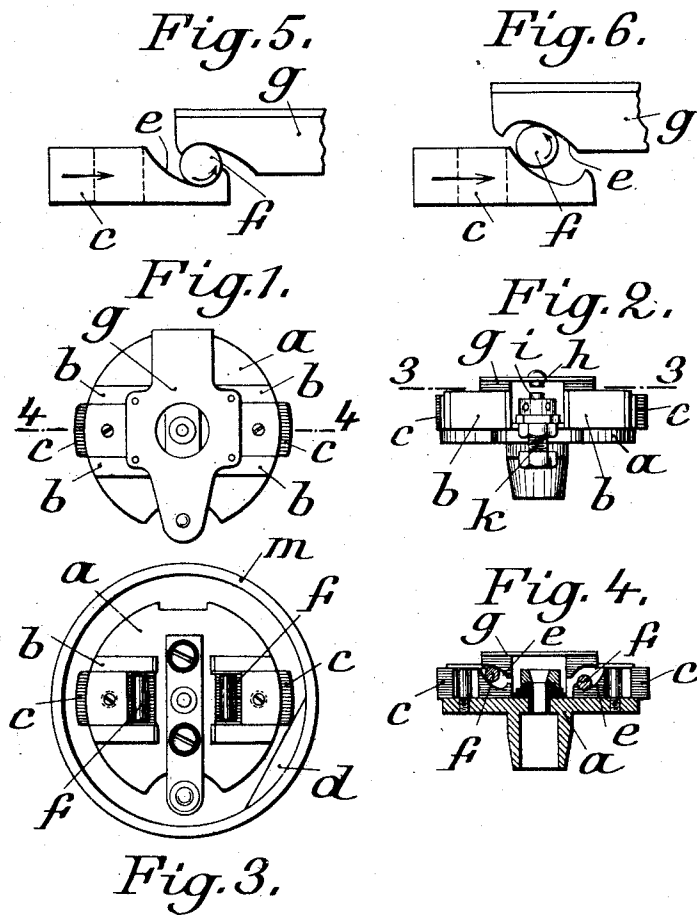


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MECHANICAL INTERRUPTER FOR ELECTRICAL IGNITION SYSTEMS.
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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GOTTLOB HONOLD, a subject of the Emperor of Germany, and residing at Stuttgart, Germany, have invented certain new and useful Improvements in Mechanical Interrupters for Electric Ignition Systems; 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.

This invention relates to mechanical interrupters for electric ignition systems for internal combustion engines, and particularly to a mechanical interrupter wherein the contacts are periodically separated in a plane perpendicular to the plane of rotation.

In mechanical interrupters heretofore employed, a lever carrying the movable interrupter contact is periodically deflected by the direct action of cams, whereby radially disposed cams separate the contacts in a radial direction while axially disposed cams separate them in an axial direction. The forms of construction effecting the radial separation of the contacts are influenced by centrifugal action, whereby the effect differs at different speeds of rotation; whereas in those forms effecting axial separation of the contacts, the time point of interruption varies when the driving shaft shifts endwise, which cannot well be avoided on account of the variation of temperature to which the armature of the ignition machine is subjected. This invention obviates these difficulties by providing a radially disposed cam and a pair of axially separable interrupter contacts, and then interposing between these two elements transmitting means comprising radially movable blocks with inclined surfaces for periodically engaging with the cam and an axially movable blade spring pressing against the balls or rollers which rest on the inclined surfaces, so that the radial movements imparted to the blocks by the cam are transmitted to the blade spring to separate the interrupter contacts in an axial direction against the stress of the blade spring. In this way the effect of centrifugal action is eliminated by disposing the interrupter contacts in an axial direction, while the effect of axial shifting of the driving shaft is overcome by disposing the cam so as to produce radial movements of the blocks.

In the accompanying drawings, showing the preferred form of my invention: Figure 1 is an end elevation of the rotating element; Fig. 2 is a side view thereof; Fig. 3 is a section on line 3--3 of Fig. 2, with the cam ring in place; Fig. 4 is a section on line 4--4 of Fig. 1; and Figs. 5 and 6 are enlarged views showing the relative positions of the inclined surfaces at the beginning and the end of an interrupting movement.

Upon the interrupter disk *a* are arranged four guides *b* between which two diametrically disposed blocks *c*, preferably of fiber or the like, are mounted so as to be inwardly movable in a radial direction when engaging with the interrupter cam *d* of the cam ring *m*. Each of the blocks *c* has a radially inclined surface *e*, which may be flat but is preferably curved as particularly shown in Figs. 5 and 6. A steel ball or roller *f* rests upon each inclined surface and presses against the oppositely disposed inclined surface of the blade-spring *g* fastened to the interrupter disk *a* and carrying the interrupter contact *h*, preferably of platinum. The cooperating interrupter contact *i* is mounted on the interrupter disk *a*, and is axially adjustable thereon by means of the screw *k*, although the interrupter contact *h* could be made adjustable, if desired. When one of the blocks *c* is moved inwardly in a radial direction by the interrupter cam *d*, the corresponding roller or ball *f* moves along the inclined surface and thereby forces the blade-spring *g* in an axial direction, to axially separate the interrupter contacts *h* and *i*. By these means the axial movement of the driving shaft has no influence on the operation since the separation of the interrupter contacts is brought about by a radial movement, while centrifugal action has no effect on the movable contact since the movement thereof is in an axial direction. The friction between the block *c* and the blade-spring *g* is reduced by the interposition of a rolling member such as a ball or roller, and is further reduced by so forming the oppositely disposed inclined surfaces on both *c* and *g* that the ball or roller rolls between them instead of sliding. Fig. 5 shows the block *c* at rest or at the beginning of its inward radial movement, while Fig. 6 shows the block at the end of its inward movement with blade-spring *g* moved to its extreme axial position. However, if desired, one of

the inclined surfaces may be omitted, and also the inclined surfaces may be flat as in an ordinary wedge, instead of being curved as shown.

5 It is preferable, though not essential, to mount the interrupter on the armature shaft of the ignition machine.

Obviously, the number of interrupter cams *d* and the number of engaging blocks *c* may be variously modified, the only essential condition in this connection being that the proper number of interruptions take place during each rotation. The cam ring *m* may be radially movable so that the 10 period of engagement of cam *d* and block *c* may be adjusted in accordance with the period of sparking desired. Also, the cam ring may be rotated and the interrupter disk kept normally stationary, or the interrupter contact *i* may be mounted on a stationary member, as is well known.

Other modifications are obviously within the scope of my invention.

Having thus described my invention, 25 what I claim is:

1. A mechanical interrupter for electric ignition systems having axially movable interrupter contacts and a radially disposed actuating cam, in combination with intermediate mechanism actuated by the cam and adapted to transform the radial movement due to the cam into axially separating movements of the interrupter contacts.

2. A mechanical interrupter for electric 35 ignition systems, comprising a radially disposed cam forming one element, axially separable interrupter contacts forming another element, one of said elements being normally stationary and the other of said elements being rotatable, and transmitting means intermediate of said elements comprising a member moving radially under the impulse of the cam and means for changing the radial movements of said 40 member to axial movements of the movable interrupter contact.

3. A mechanical interrupter for electric

ignition systems, comprising a normally stationary radially disposed cam, a pair of interrupter contacts, and rotatable transmitting means intermediate of the cam and the 50 contacts for changing the radial movements imparted by the cam to axially separating movements of the interrupter contacts.

4. A mechanical interrupter for electric 55 ignition systems, comprising a radially disposed actuating cam, a disk having a radially movable member provided with an inclined surface and arranged to be moved inwardly by the cam, an axially movable 60 interrupter contact, and a transmitting member actuated by the inclined surface to impart axial movement to the interrupter contact.

5. A mechanical interrupter for electric 65 ignition systems, comprising a radially disposed cam, a disk having a radially movable member provided with an inclined surface and arranged to be moved inwardly by the cam, a rolling member resting on the 70 inclined surface, a blade-spring on the rolling member, an axially disposed interrupter contact mounted on the blade-spring, and a cooperating interrupter contact.

6. A mechanical interrupter for electric 75 ignition systems, comprising a radially disposed cam, an interrupter disk having a pair of diametrically disposed slidable members each provided with an inclined surface and arranged to be moved inwardly 80 in a radial direction by the cam, a rolling member resting on each of said inclined surfaces, a blade-spring fastened to the interrupter disk and resting on the rolling members, an axially disposed interrupter 85 contact mounted on the blade-spring, and a cooperating interrupter contact mounted on the interrupter disk.

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

GOTTLOB HONOLD.

Witnesses:

REINHOLD ELWERT,
WALTHER STEINCKE.