July 30, 1957 A. W. WINKLEY 2,801,304

INTERRUPTERS FOR ENGINE SPARK-IGNITION APPARATUS

Filed Jan. 25, 1955 2 Sheets-Sheet 1

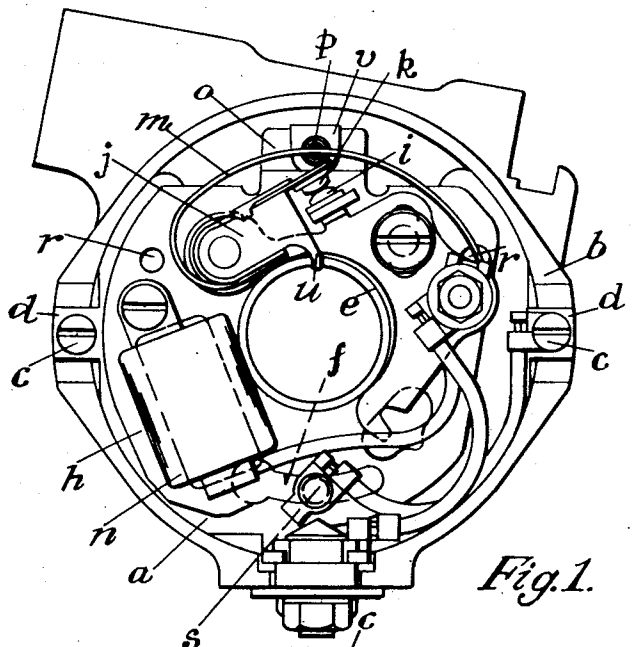


Fig. 1.

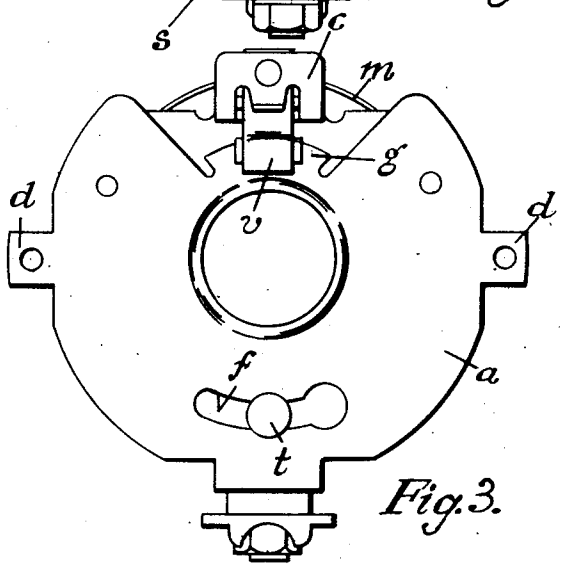


Fig. 3.

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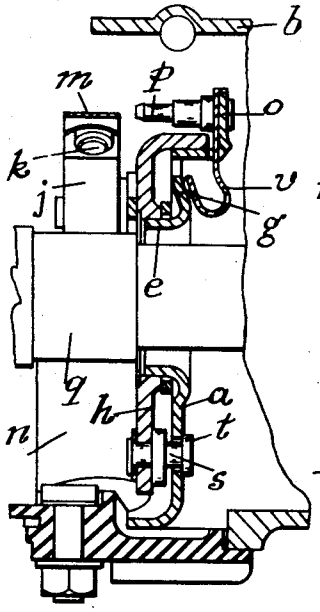


Fig. 2.

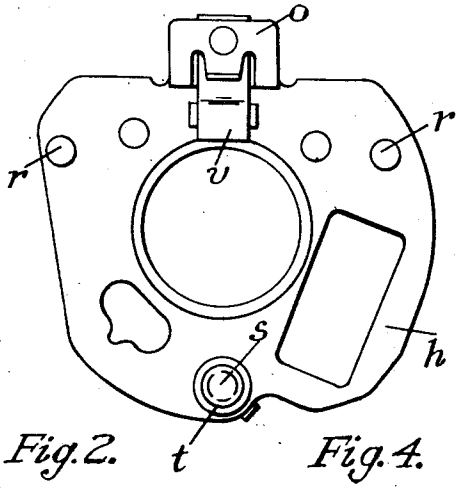


Fig. 4.

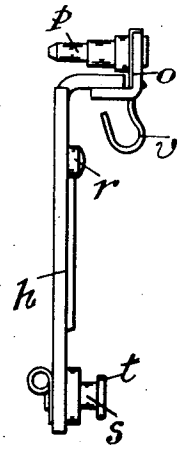


Fig. 5.

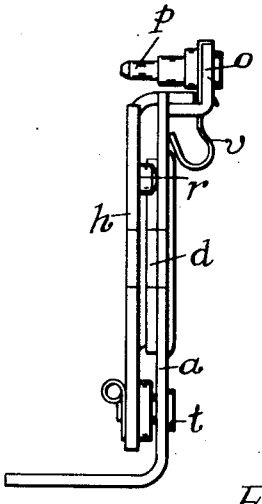


Fig. 6.

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INTERRUPTERS FOR ENGINE SPARK-IGNITION APPARATUS

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Application January 25, 1955, Serial No. 483,898

1 Claim. (Cl. 200—30)

This invention relates to interrupters for engine spark-ignition apparatus, of the kind in which a pair of contact pieces are mounted on a carrier having angular freedom of movement relatively to a fixed supporting member, separation of the contact pieces being effected by the action of a rotary cam on a spring-loaded arm to which the movable contact piece is attached. The angular freedom of the contact piece carrier serves to vary the ignition timing and may be effected manually, or by a governor responsive to, for example, the pressure in the air-intake manifold of the engine.

When the interrupter is in action the cam intermittently exerts on the arm associated with the movable contact piece a radially directed force which tends to deflect the plane of the contact piece carrier relatively to the supporting member, and so impairs the desired smoothness of the angular movement of the carrier as wall as causing unequal separation of the contacts, and the object of the present invention is to provide an improved construction whereby this disadvantage is obviated.

An interrupter in accordance with the invention comprises the combination of a fixed supporting member, a contact piece carrier mounted on the said member with angular freedom of relative movement, three abutment pieces arranged to form a three-point lateral support between the contact piece carrier and the supporting member, and a loading spring, two of the abutment pieces being situated wholly between the supporting member and the contact piece carrier, and the third being arranged to extend from one of these parts through an arcuate slot in the other and having a head which bears against the outer surface of the said other part, and the arrangement being such that the loading spring tends to tilt the contact piece carrier in the same direction as the actuating force exerted by the cam.

In the accompanying drawings, Figure 1 is a front elevation, Figure 2 a sectional side elevation, and Figure 3 a rear elevation illustrating a mechanism of the kind aforesaid provided with the invention. Figure 4 is a rear elevation and Figure 5 a side elevation of the plate forming the contact piece carrier, and Figure 6 is a side elevation showing this plate mounted on the supporting plate.

Referring to the drawings, the supporting member consists of a metal plate *a* adapted to be secured within the housing *b* of the mechanism by means of screws *c* inserted through lugs *d*. At the centre of this plate is formed an annular boss *e* the outer periphery of which serves as a bearing for the contact piece carrier. Also in the plate *a* is formed an arcuate slot *f* which has an enlarged aperture at one end as shown in Figure 3. Diametrically opposite this slot the said plate has formed in it, at about the same radial distance from the axis of the boss, a gap shaped to provide a segmental track *g* for a loading spring to be hereinafter described.

The contact piece carrier consists of a plate *h* having a substantially central hole which receives the boss *e* of

the supporting member. On this plate is secured the fixed contact piece *i* and adjacent to the latter is pivotally mounted the arm *j* which carries the movable contact piece. The usual bowed spring *m* which loads the arm is attached at its ends to the arm and plate *h* respectively. On the same plate is also carried the usual condenser *n* for suppressing sparking between the contact pieces.

The plate *h* is angularly movable on the plate *a* and has secured to it a lug *o* to which is attached a pin *p* for connection to the means (not shown) for actuating the said plate. Actuation of the contact carrying arm is effected in the usual manner by a rotary cam *q*.

According to the invention the rear side of the plate *h* has formed or secured to it three abutment pieces, these being arranged at appropriately equal radial distances from the axis of the bearing as will be clearly seen in Figures 4 and 5. Two of them are indicated by *r* and are preferably made from nylon or the like and are situated at the side of the bearing adjacent to the contact arm. The third is formed by a metal peg *s* which is necked and adapted to extend through the arcuate slot *f* in the supporting plate *a*, an annular shoulder *t* on the peg being adapted to abut against the rear side of the supporting plate. Also the peg *s* is situated at the opposite side of the centre of the plate to the pieces *r* and on a diametrical line which passes through the free end *u* (Figure 1) of the arm *j* carrying the movable contact piece.

Further there is attached to the lug *o* on the plate *h* a blade spring *v* the free end of which is bowed and arranged to press against the track *g* above mentioned on the plate *a*. The position of this spring is located on the diametrical line above mentioned so that by its pressure on the track it maintains the shoulder *t* on the peg *s* in contact with the rear side of the plate *a*. The two studs *r* and a peg *s* thus form a three point lateral support for the plate *h* and the spring *v* tends to tilt the said plate continually in the same direction as the force exerted by the cam *q* on the contact carrying arm *j*, thereby eliminating the above mentioned undesirable effect of the cam action. In this respect it will be evident from Figure 2 that the intermittent action of the cam *q* on the arm *j* will tend to impart tilting movements in a clockwise direction to the carrier *h* about an axis passing through the points of contact of the studs *r* with the plate *a*, this being due to the fact that the arm is mounted on the left-hand side of the carrier, and the latter is restrained against upward movement by the boss *e* on the support *a*. As, however, the carrier *h* is constantly urged by the spring *v* into the tilted position into which it would otherwise be intermittently movable under the action of the cam *q*, the position of the carrier is unaffected by the action of the cam. As shown in Figure 2, the spring *v* tends, by its interaction with the track *g* on the fixed support *a*, to move the carrier upwardly and axially, but as upward movement of the carrier is restrained, the spring tilts the carrier in a clockwise direction about the above mentioned axis to an extent determined by the abutment piece *t*.

The invention is not however, limited to the above example, as the three point support may be provided by reversing the arrangement of the abutment pieces and the loading spring, these being then arranged on the plate *a*. Also the loading spring may be placed in any other appropirate position.

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

An interrupter for an engine spark-ignition apparatus, comprising in combination a pair of components in the respectve forms of a fixed supporting member and a carrier having angular freedom of movement relatively to

said supporting member, said components being adjacently situated side by side, a spring-loaded arm pivotally mounted on the outer side of said carrier, a pair of mutually engageable contact pieces respectively mounted on said carrier and spring-loaded arm so that the latter tends to urge the contact piece thereon into contact with the other, a rotary cam arranged to act intermittently on said arm for effecting separation of said contact pieces, three abutment pieces spaced from the axis of said carrier and forming a three-point support for the said carrier on said supporting member, two of said abutment pieces being situated wholly between the adjacent sides of the components formed by said supporting member and carrier, and the other of the said abutment pieces being arranged to extend from one of said components through an arcuate slot in the other component and having a

head which bears against the outer side of the slotted component for limting tilting movement of said carrier in the direction in which the latter is intermittently urged by the action of said cam on said arm, and a loading spring acting on the outer side of said carrier at a position where said spring serves constantly to retain said carrier in the tilted position into which it would otherwise be intermittently movable under the action of said cam.

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