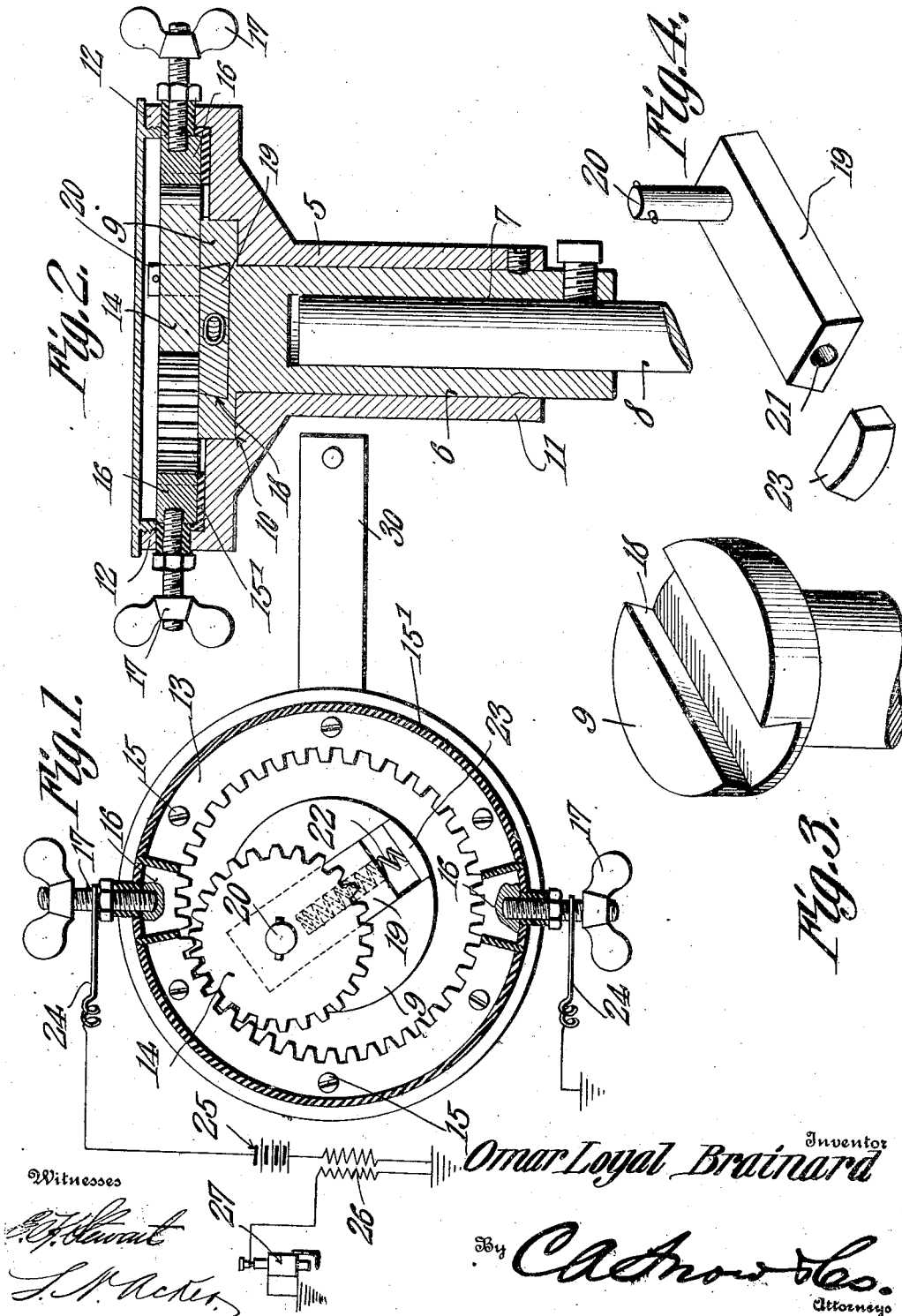


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 SPARK TIMER FOR INTERNAL COMBUSTION GAS ENGINES.
 APPLICATION FILED JAN. 20, 1909.

941,556.

Patented Nov. 30, 1909.



UNITED STATES PATENT OFFICE.

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SPARK-TIMER FOR INTERNAL-COMBUSTION GAS-ENGINES.

941,556.

Specification of Letters Patent.

Patented Nov. 30, 1909.

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To all whom it may concern:

Be it known that I, OMAR L. BRAINARD, a citizen of the United States, residing at Sacramento, in the county of Sacramento and State of California, have invented a new and useful Spark-Timer for Internal-Combustion Gas-Engines, of which the following is a specification.

This invention relates to gas engines and more particularly to a timing device for the spark ignition of internal combustion gas engines.

Heretofore, it has been proposed to effect the make and break of the sparking circuit of a gas engine by means of a contact ring mounted eccentrically with respect to the engine shaft and movable into engagement with a contact member concentric with said shaft to intermittently close the circuit. Owing to the sliding movement of the contact ring, the latter soon becomes worn and renders the timer practically useless for the purpose designed. It has also been proposed to make the movable contact member in the form of a wheel or roller which frictionally engages a sectional contact ring for intermittently closing the circuit to the battery. This type of timer is also defective, in that the roller soon becomes flat and the track or sectional contact member worn or otherwise impaired, thus preventing a good electrical contact between the parts and causing the sparking device to miss fire.

The object of the present invention is positively to insure a good electrical contact between the relatively stationary and movable members by making one of said contacts in the form of a spur gear and providing the other with internal teeth which engage the teeth on the spur gear to automatically close the circuit at predetermined intervals.

Further objects and advantages will appear in the following description, it being understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims.

In the accompanying drawings forming a part of this specification:—Figure 1 is a top plan view of a timing device constructed in accordance with my invention. Fig. 2 is a vertical sectional view of the same. Fig. 3 is an enlarged detail perspective view of the upper end of the post or stub shaft. Fig.

4 is a perspective view of the slide and stop block removed from the post.

Similar numerals of reference indicate corresponding parts in all of the figures of the drawings.

The improved timing mechanism forming the subject matter of the present invention includes a stationary member 5 and a movable member 6, the latter being provided with a socket 7 for the reception of the adjacent end of the cam shaft 8 of an internal combustion engine (not shown).

The movable member 6 is keyed to the shaft 8 and provided with a circular head 9 which engages a correspondingly shaped seat 10 formed in the adjacent end of the stationary member, thereby to permit the member 6 to rotate with the shaft and relatively to the member 5.

The lower end of the stationary member 5 is provided with a sleeve 11 which telescopes the member 6, while the upper end thereof is formed with a peripheral flange 12 which serves as a support for a sectional internal gear 13 constituting the stationary contact of the timing device, the movable contact being in the form of a spur gear 14 mounted for rotation with the member 6.

The internal gear 13 is secured to the relatively stationary member 5 by screws or similar fastening devices 15, said internal gear being formed with oppositely disposed relatively short segments 16 insulated from the adjacent portion of the gear and also from the stationary member 5 by a strip of suitable insulating material 15', there being binding screws 17 threaded in the segments 16, as shown.

The head 9 of the movable member 6 is provided with a transversely disposed slot 18, preferably dove-tailed in cross section, and in which is slidably mounted a correspondingly dovetailed block or slide 19 carrying a pin 20, which latter forms the axis of the spur gear 14, as shown.

Seated in an opening 21 in one end of the slide 19 is a coiled spring 22, the opposite end of which bears against a stop block 23 carried by the head 9 and forms a closure for one end of the groove 18.

The function of the spring 22 is normally and yieldably to support the teeth of the spur gear 14 in engagement with the teeth of the internal gear 13, thereby to insure a good electrical contact between the parts and pre-

vent the sparking mechanism from missing fire. The wires 24 are connected with the adjacent binding screws 17 and are both grounded preferably on the engine frame, there being a battery 25 and the usual induction coil 26 included in the circuit for actuating the sparker, indicated at 27. Thus it will be seen that as the shaft 8 revolves the spur gear 14 will engage the teeth of the internal gear 13 and as the gear passes the segments 16 the teeth on the gear and segments will interengage thus closing the circuit through said gear, movable member or post 6 and frame to the battery and thence back to the adjacent binding post.

A lever 30 is preferably secured to the stationary member so that the latter may be rotated with respect to the movable member when it is desired to change the timing of the make and break.

It will here be noted that the shaft 8 is arranged concentric with the teeth of the gear 13, while the spur gear 14 is eccentrically mounted with respect to the longitudinal axis of the shaft 8 so as to be in a position to engage the teeth on the gear 13, as the shaft revolves. It will also be noted that the spring 22 by engagement with the slide 19 serves to normally and yieldably support the teeth of the spur gear in engagement with the teeth on the internal gear 13 thus not only insuring a good contact between the parts but serving to assist in preventing mutilation or excessive wear on the teeth of said gear.

The timing mechanism shown and described is particularly designed for a two-cylinder engine but it will of course be understood that by changing the number of contacts or segments in the internal gear, the device may be used with equally good results on other types of engines.

Having thus described the invention what is claimed is:—

1. A spark timing device comprising a stationary member having a seating recess, an internal gear on said member concentric with said recess and provided with a plurality of insulated segments, a movable member having a head journaled in the seating recess and having a diametrical groove in its head, a slide seated in said groove and engaging the walls of the same, a pin at one end of the slide disposed par-

allel with the axis of the member, a spur gear rotatably mounted on said pin, and meshing with the internal gear on the stationary member, and means between the slide and the end of the slot for holding the slide normally projected to maintain the gears in mesh.

2. A spark timing device including relatively stationary and movable members, one of which is formed with a seating recess constituting a bearing and provided with an internal gear having a series of insulated segments constituting contacts, the other member being provided with an enlarged head journaled in said seating recess having a transverse slot formed therein, a slide mounted in said slot and provided with a pin, a block forming a closure for one end of the slot and conforming to and adapted to bear against the wall of the seating recess, a spur gear mounted for rotation on the pin, and means interposed between the block and slide for yieldably supporting the spur gear in engagement with the teeth on the internal gear.

3. A spark timing device including relatively stationary and movable members one of which is provided with a seating recess, an internal gear carried by the stationary member and provided with one or more toothed segments constituting contacts, a movable member having an enlarged head journaled in said seating recess and provided with a transverse slot, a slide arranged within said slot and provided with a pin, a spur gear mounted for rotation on said pin and adapted to engage the teeth on the internal gear, said spur gear being disposed eccentrically with respect to the longitudinal axis of the movable member, a stop forming a closure for one end of the slot and conforming to and bearing against the interior wall of the seating recess, and a spring interposed between the stop and slide for normally and yieldably supporting the spur gear in engagement with the teeth on the internal gear.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

OMAR LOYAL BRAINARD.

Witnesses:

EDW. S. CEEHATTUN,
JAMES GEDDES.