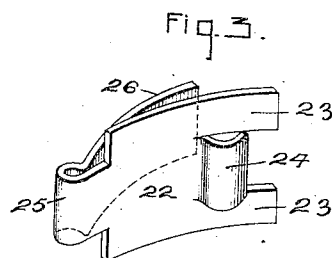
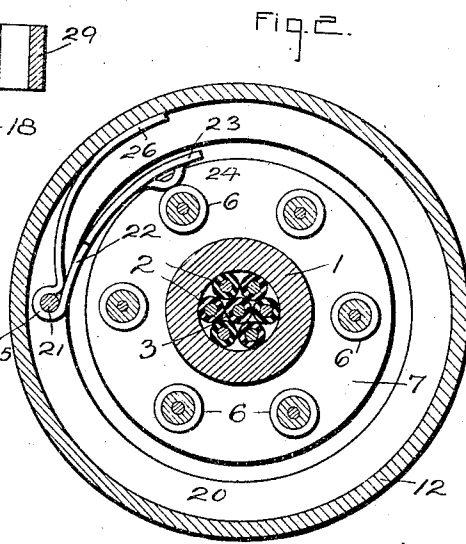
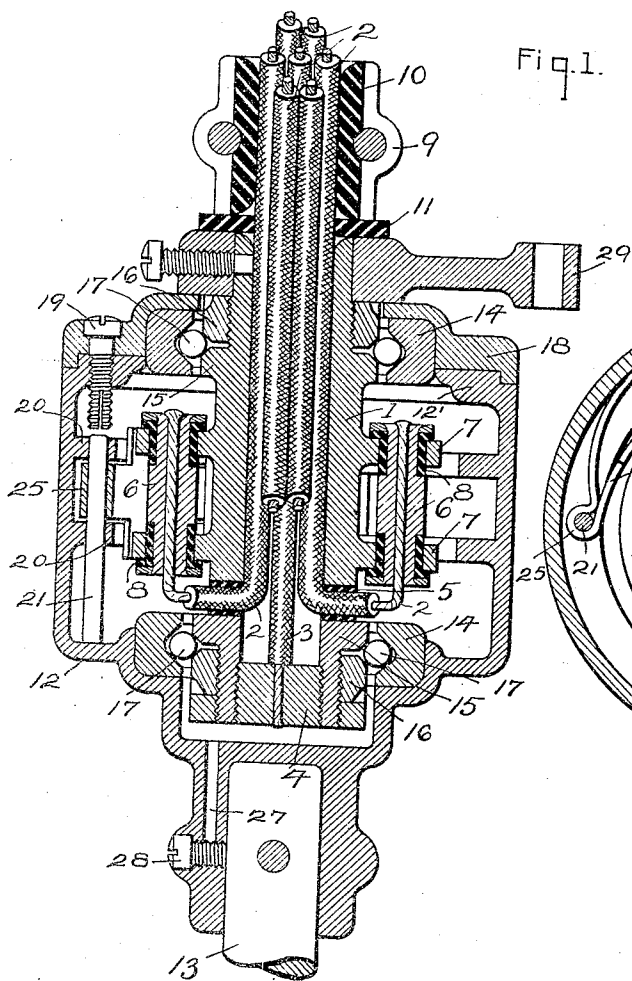


952,166.

Patented Mar. 15, 1910.



Witnesses:
 Earl G. Klock.
 J. Ellis Elm.

Inventor:
 Gilbert Wright,
 by *Alfred Davis*
 Atty.

UNITED STATES PATENT OFFICE.

GILBERT WRIGHT, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

AUTOMATIC TIMER.

952,166.

Specification of Letters Patent. Patented Mar. 15, 1910.

Application filed December 24, 1908. Serial No. 469,085.

To all whom it may concern:

Be it known that I, GILBERT WRIGHT, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Automatic Timers, of which the following is a specification.

This invention relates to multicylinder internal combustion engines, and its object is to provide an improved device for timing the instant of firing the explosive charges in the several cylinders. The customary means for accomplishing this is a rotating contact cooperating with a series of stationary contacts, and my invention is a timer of this general description.

The features of novelty are hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawing, Figure 1 is a vertical section and Fig. 2 a cross-section of my improved timer, while Fig. 3 is a perspective view of the movable contact.

The stationary element of the timer is a tubular hub 1 through which are led the insulated conductors 2, corresponding in number to the cylinders of the engine, in which said conductors are connected with the spark plugs. A supply conductor 3 is also led into the hub and is electrically connected therewith; preferably by means of a nut 4 screwed into the end of the hub and attached to the end of the conductor 3. Near the lower end of the hub are radial holes, preferably provided with bushings 5 of insulation, through which the conductors 2 are distributed to the stationary contacts 6. These are preferably made cylindrical or spool-shaped and there is a separate spool for each conductor, and said spools are supported in openings in flanges 7 projecting from the hub. The spools are insulated from the flanges by insulating bushings 8, and are spaced at equal distances apart around the hub. The hub and spools are supported by the conductors, which are secured by a clamp 9, attached to the frame of the engine and provided with a heavy insulating bushing 10 and washer 11.

A casing 12 surrounds the hub and spools, and is so mounted as to be rotatable concentric therewith, preferably by securing it to the end of a shaft 13 in alinement with the

a ball bearing, consisting of a grooved ring 14 carried by the casing, and a chamfered flange 15 on the hub, which forms with a beveled nut 16, adjacent thereto, a raceway for the balls 17. Said nut engages with screw threads formed on the end portion of the hub outside of the flange 15. The end of the casing opposite its point of attachment to the shaft 13 is closed by a cap 18, secured by screws 19, entering an internal flange 12' on the casing. On the inside of the casing are projections 20 which contain perforations to receive a pin 21 on which is pivoted the movable contact, comprising a spring plate 22 having members or fingers 23 which rest and ride upon the peripheries of the flanges 7 on the hub. Between said fingers is an inwardly curved portion 24 which is adapted to touch the central portions of the spools between the flanges 7 as the casing revolves, and thus close the circuit between the supply conductor 3 and the successive conductors 2 connected with the spools since portion 24 is in electrical connection with members or fingers 23. The spring plate is doubled upon itself to form an eye 25 for the pivot pin, and this construction also provides an arm 26 which bears against the inside of the casing and urges the fingers 23 against the flanges 7. The pin 21 is located in line with one of the screws 19, so that when the cap 18 is unfastened and the hub with its spools and ball bearings is lifted out of the casing, the spring contact can then be released by sliding the pin up through the screw hole. The distance from the face of the curved contact portion 24 of the movable contact to the faces of the fingers 23 that bear on the flanges or supporting elements 7 is less than that between the peripheries of said flanges and the outer surfaces of the spools, so that the end of the spring will be raised slightly as it passes the spools. In order to preserve this relative proportion of these parts, the bearing surface of the fingers on the flanges is so proportioned to that of the contact 24 on the pins that they will all wear equally and thus give the same amount of contact even after long use. The casing is filled with lubricating oil which also serves to extinguish the sparks at the contacts. The axis of the driving shaft 13 which rotates the casing may be either vertical or hori-

drainage port 27 may be made in the lower end of the casing, and closed by a removable screw 28.

In order to provide for advancing or retarding the spark in the engine cylinders, a lever 29 is secured to the upper end of the hub, by means of which said hub can be given a slight angular movement. In so doing; the conductors 2 3 will twist slightly between the stationary clamp at the top and the holes in the hub through which they are led out at the bottom.

The principal advantages of my invention are that there are no moving wires outside of the timer; no adjustments to work loose; the movable contact is a simple, light and easily replaceable part, which will not jump or hammer; it is self-adjusting for wear; and the entire device is easily constructed and of moderate cost.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. A timer for internal combustion engines, comprising a tubular hub, a plurality of contacts carried thereby and insulated therefrom, insulated conductors led through said hub and connected respectively with said contacts, a casing rotatable concentric with said hub, and a movable contact carried by said casing.
2. A timer for internal combustion engines, comprising a tubular hub, a plurality of contacts carried thereby and insulated therefrom, insulated conductors led through said hub and connected with said contacts, a casing surrounding said hub, a contact carried by said casing, ball bearings between said hub and casing, and means for rotating said casing.
3. A timer for internal combustion engines, comprising a tubular hub having flanges, a plurality of contacts carried by but insulated from said flanges, insulated conductors led through said hub and connected with said contacts, a rotatable casing concentric with said hub, and a contact carried by said casing and bearing on said flanges.
4. A timer for internal combustion engines, comprising a tubular hub having flanges, a plurality of spools carried by but insulated from said flanges, insulated conductors led through said hub and connected with said spools, a rotatable casing concentric with said hub, and a spring contact carried by said casing and adapted to bear on said flanges and make contact with said spools.

5. A timer for internal combustion engines comprising a plurality of stationary contacts, a movable contact composed of contact members and a portion in electrical connection therewith adapted to make contact with the stationary contacts, and supporting elements on which said members rest, the wearing surfaces of the members on said supporting elements being of such an area as to wear down equally with the cooperating surfaces of the movable and stationary contacts.

6. A timer for internal combustion engines comprising a plurality of stationary contacts, a movable contact composed of fingers and a portion in electrical connection therewith adapted to make contact with the stationary contacts, and supporting elements on which said fingers rest, the wearing surfaces of the fingers on said supporting elements being of such an area as to wear down equally with the cooperating surfaces of the stationary contacts and the portion of the movable contact cooperating therewith.

7. A timer for internal combustion engines, comprising a tubular hub having flanges, a plurality of spools carried by but insulated from said flanges, insulated conductors led through said hub and connected with said spools, a rotatable casing concentric with said hub, and a spring contact carried by said casing and having fingers bearing on said flanges and a contact portion adapted to touch said stationary contacts as the casing revolves.

8. A timer for internal combustion engines, comprising a tubular hub having flanges, a plurality of spools carried by but insulated from said flanges, insulated conductors led through said hub and connected with said spools, a rotatable casing concentric with said hub, and a spring contact carried by said casing, and having fingers bearing on said flanges and a contact portion in electrical connection therewith adapted to touch said stationary contacts as the casing revolves, the wearing surfaces of said fingers on said flanges being of such area as to wear down equally with the cooperating surfaces of the contact portion of the spring contact and the spools.

In witness whereof, I have hereunto set my hand this 21st day of December, 1908.

GILBERT WRIGHT.

Witnesses:

BENJAMIN B. HULL.
HELEN ORFORD.