H. SCHAAKE & J. T. COWIE.

SPARK TIMER FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED FEB. 7, 1908.

915,891. Patented Mar. 23, 1909.

FIG. 1.

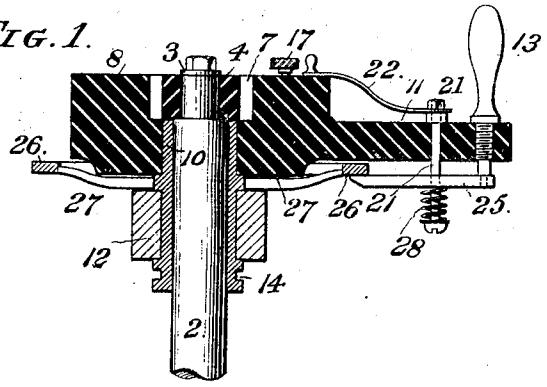


FIG. 2.

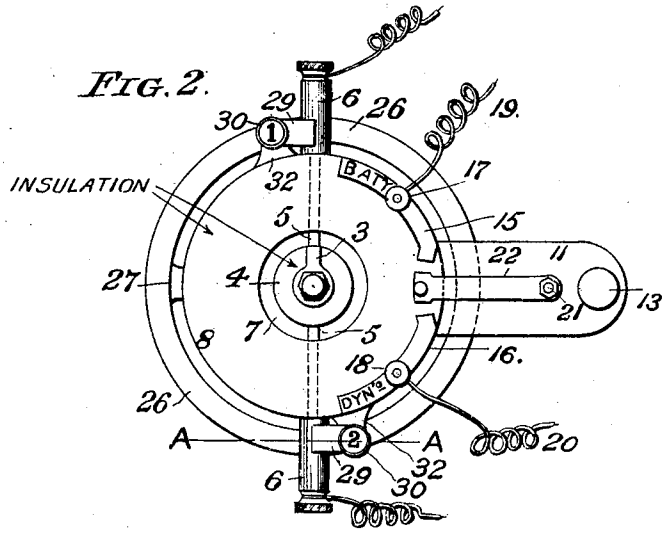
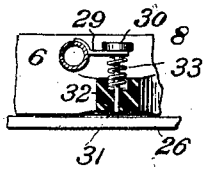


FIG. 3.



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SPARK-TIMER FOR INTERNAL-COMBUSTION ENGINES.

No. 915,891. Specification of Letters Patent. Patented March 23, 1909.

Application filed February 7, 1908. Serial No. 414,719.

To all whom it may concern:

Be it known that we, HENRY SCHAAKE and JOHN T. COWIE, citizens of the Dominion of Canada, residing at New Westminster, in the Province of British Columbia, Canada, have invented a new and useful Improvement in Spark-Timers for Internal-Combustion Engines, of which the following is a specification.

This invention relates to a spark timing device for internal combustion engines, and our object has been to combine in one compact device a spark timer and a battery and dynamo switch by which the several means for starting a gas engine are together and conveniently placed for operation and to this combination is applied a system by which contact of the spark coil to any particular cylinder of the engine may be made by means of a push button, so that if an engine should be temporarily stopped while its cylinders are charged with gas, the spark may be given to that cylinder the crank of which is in a favorable position to receive the explosion and start the engine. By this means the necessity for cranking is avoided or the spark timer need not be moved from the proper starting position on which it may be set.

The invention is fully described in the following specification, and illustrated in the drawings by which it is accompanied, in which:

Figure 1 is a vertical section through the device, Fig. 2, a plan of the same, and Fig. 3, a section on the line A A in Fig. 2.

On the end of the crank shaft of the engine or preferably on a vertical shaft 2 driven therefrom at an equal speed of rotation is a rotatable element the metallic contact 3 of which is in electrical connection with the shaft 2 and therethrough with the frame of the engine and the insulation 4 in which 3 is set is concentric with the shaft 2. The brushes 5 for this rotatable element, one for each cylinder of the engine, are mounted in spring cases 6 and pass through a ring of insulating material 8 concentric with the rotatable element with an annular air space 7 between. This brush carrying ring 8 is secured to and projects upward from the boss of a lever 11 of the same insulating material which is rotatable on the outside of an upward projection 10 of the bearing 12 in which the shaft 2 runs, so that by means of a handle 13 on the lever 11, the position of the brushes 5 relative to the contact 3 may be varied and the timing of the sparks in the cylinders of the engine regulated in relation to the position of their cranks.

On the upper outer edge of the insulating ring 8 which carries the brushes and adjacent to the lever 11 are contact plates 15 and 16 each provided with binding screws 17 and 18 to which the wires 19 and 20 from battery and dynamo are respectively connected, and pivotally mounted on a pivot pin 21 on the lever 11 is a resilient switch 22 by which contact may be made with either the battery or the dynamo contact plate 15 or 16. The electrical contact of the switch 22 with the frame of the engine is made through the pivot 21 which passes through the insulation of the lever 11 to a bar 25 the outer end of which bar 25 rests on the produced lower end of the handle 13, the inner end bearing on the underside of a metal contact ring 26 concentric with the axis of the shaft 2 and supported to the bearing 12 thereof by a spider frame 27, the bar 25 being held in frictional contact with the contact ring 26 by a spring 28 on the lower end of the pivot 21. The sparking circuit may thus be closed to the battery while starting by contact of the switch 22 with the plate 15, and thereafter be opened to the battery and closed to the dynamo by throwing the switch into contact with the plate 16.

Adjacent to the brushes 5 and secured to resilient metal connections 29 extending from the spring cases 6 of the brushes are push buttons 30, each having a metallic stem 31 by which contact may be made between the brush through its case and the contact ring 26 beneath. The stem of each push button passes through and is supported by a projection 32 from the periphery of the brush carrying ring 8 a light spring 33 being introduced on the stem to hold it out of contact with the ring 26 until the finger is applied to establish contact.

By means of any one of these push buttons the sparking circuit may be closed and a spark given in any cylinder the crank of which may be in a favorable position for starting and thus, assuming the cylinders to be charged with gas, the necessity for cranking the engine is avoided and the timer brushes need not be moved from the proper starting position on which they may be set.

The device is illustrated as applied to an

engine of two cylinders, but it will be obvious that it is not limited to such as the number of brushes will correspond to the number of cylinders or cranks and the push buttons to the number of brushes.

If thought desirable the gas or throttle valve of the engine may be operated by a lever pivotally mounted on a bearing 14 concentric with the axis of the shaft 2 so that the principal operating handles of the engine may be all together in one place and conveniently arranged for manipulation.

Having now particularly described our invention and the manner of its operation, we hereby declare that what we claim as new and desire to be protected in by Letters Patent, is:

1. In a spark timer, the combination with a rotatable element rotatable at the same speed as the engine crank shaft and insulated brushes therefor, of means for supporting the brushes on an insulating ring which is movable concentrically with the rotatable element, plates on said concentrically movable insulating ring to which the battery and dynamo circuits are respectively connected, and a switch pivotally mounted to contact with either of said plates, which switch is in electrical contact with a ring concentric with the axis of rotation of the rotatable element and in electrical contact with the engine.

2. In a spark timer, the combination with a rotatable element, of an insulated brush holder which is movable concentrically with said element, plates on the insulation to which a battery and dynamo are respectively connected, a switch in electrical contact with the engine by which connection may be made to either the battery or dynamo circuit, a contact ring concentric with the rotatable element and in electrical contact with the engine, means for connecting the brushes with the contact ring, and means for holding said means normally out of contact.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

HENRY SCHAAKE.
JOHN T. COWIE.

Witnesses:
LEILA WINTEMUTE,
HENRY L. EDMONDS.