E. B. JACOBSON.

IGNITION TIMER.

APPLICATION FILED FEB. 19, 1919.

1,325,501. Patented Dec. 16, 1919.

FIG. 1

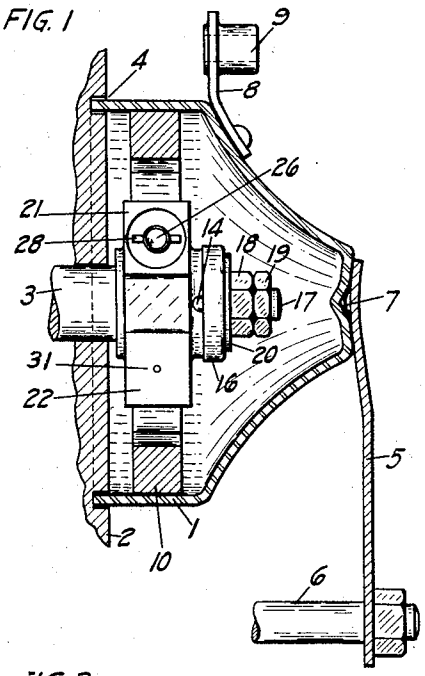


FIG. 2

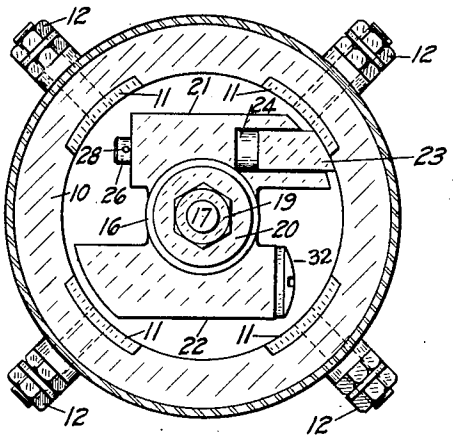


FIG. 3

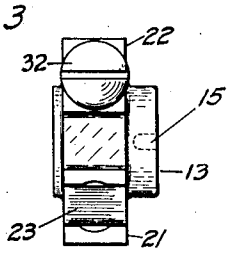


FIG. 4

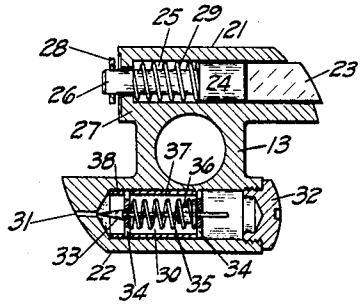
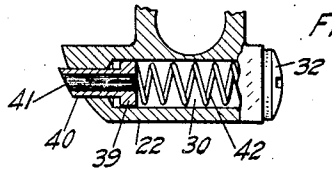


FIG. 5

FIG. 6



WITNESSES:
Raymond L. Tucker
Lela M. Cole

INVENTOR,
BY EDWARD B. JACOBSON,
Thos. J. Whittemore
ATTORNEY

UNITED STATES PATENT OFFICE.

EDWARD B. JACOBSON, OF PITTSFIELD, MASSACHUSETTS, ASSIGNOR TO J AND B MANUFACTURING COMPANY, OF PITTSFIELD, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

IGNITION-TIMER.

1,325,501. Specification of Letters Patent. Patented Dec. 16, 1919.

Application filed February 19, 1919. Serial No. 278,046.

To all whom it may concern:

Be it known that I, EDWARD B. JACOBSON, a citizen of the United States, residing at Pittsfield, in the county of Berkshire and State of Massachusetts, have invented certain new and useful Improvements in Ignition-Timers, of which the following is a specification.

The present invention more particularly relates to the rotor portion of ignition timing apparatus, and has for its primary object the provision of improvements in the structure and operation of the wiper or contactor, which successively establishes circuit connection with the several terminal sectors in the casing, and also, in combination therewith, the provision of improved means for automatically lubricating the course traveled by the contactor.

Referring to the accompanying drawings, Figure 1 is a vertical section of an ignition timer embodying my present invention in its preferred form and operatively mounted upon a cam-shaft; Fig. 2, a face view of the same, the front portion of the housing being cut away; Fig. 3, a front end view of the rotor portion; Fig. 4, a cross-sectional view of the same; Fig. 5, a detail view of one of the valve bearings in the lubricating portion of the rotor; and Fig. 6, a cross-sectional view showing a modified form of the lubricating portion of the rotor, the remaining or contactor portion being cut away.

The mechanism herein illustrated is designed for use in connection with a four-cylinder explosive engine having a gear-driven cam-shaft operated by the main engine shaft, but, it should be understood, however, that my invention is susceptible of application, with slight modification, to motors having any other number of explosion cylinders, and may be otherwise mounted and driven.

This invention may be adapted to any suitable form of housing or casing, the casing 1 herein illustrated being adjustably mounted on the front of the engine housing 2 and arranged to inclose the front end of a cam-shaft 3, which is preferably geared to the main engine shaft (not shown), and extends through a suitable opening in the wall of the engine housing.

The rear end of the casing 1 is open and seated in a circular recess 4 provided on the face of the engine housing 2, said recess being adapted to prevent eccentric displacement of the casing. Forward displacement of the casing is prevented preferably by a spring clamp 5 removably secured at its rear end to a stud or bolt 6 fixed to the wall of the engine housing 2, and engaging at its opposite end the outer extremity of the reduced forward extension of the front of the casing, which has a central depression to receive a boss 7 provided on the clamp 5. Rotary movement of the casing for regulating the time of ignition is controlled by a lateral arm 8 exteriorly mounted on the casing and provided with a bearing 9 to receive a control-rod (not shown).

Within the casing 1 is an insulation ring 10 provided at regular intervals with arcuate contacts 11, 11, which are embedded on its inner rim and suitably connected to separate terminals 12, 12, etc., arranged on the outside of the casing 1, for connection with the primary circuit of separate induction coils.

Mounted to rotate with the shaft 3 within the casing 1 is a metallic carrier 13 in the form of a sleeve which is normally secured against axial movement on the shaft by a transversely arranged removable pin 14 projecting through a suitable opening in the shaft and extending at one of its ends into a slot 15 provided on the outer rim of the carrier. The pin 14 is secured against endwise displacement by a cup washer 16 fitted over the outer end of the carrier and inclosing the exposed end of the pin 14, the reduced outer end 17 of the shaft being projected through the cup washer 16 and suitably threaded to receive a pair of nuts 18, 19, which are employed in conjunction with a flat washer 20, carried on the reduced end of the shaft and engaging the face of the cup washer, to secure the latter in position.

The carrier 13 is provided at opposite points on its periphery with a pair of fixed metallic arms 21, 22, arranged in parallel relation to each other in the plane of the insulation ring 10. Said arms are extended in opposite directions toward the insulation ring 10 and into positions adjacent thereto, their respective outer ends being arcuate in outline to afford an even clearance at all points between their faces and the inner

rim of the ring 10. One of said arms 21 is arranged to carry at its outer end a movable contactor 23 for slidably engaging the inner rim of the insulation ring 10, the outer end of the contactor being arcuate in outline to conform to the outline of the ring 10. The contactor 23 preferably consists of a rectangular block of steel adapted to move lengthwise in a slot of the same dimensions provided transversely in the outer end of the contact-arm 21 and is provided with a stem 24 extending rearwardly into a corresponding bore 25 provided lengthwise in the body of the contact-arm and communicating with said slot at the outer end. Said stem 24 has a reduced portion 26 which extends through a suitable opening provided in the rear wall 27 of the chamber formed by the bore 25 and beyond said wall and carries on its rear extremity in the rear of the contact-arm 21 a removable taper-pin 28 driven through a suitable transverse opening provided in said reduced-portion 26, said pin being adapted to engage the rear face of the contact-arm at the limit of forward movement of the contactor 23. Mounted on the reduced-portion 26 of the stem in the bore 25 is an expansion spring 29 operating to urge the contactor 23 forward, into constant engagement with the insulation ring 10.

The remaining arm or lubricator 22 of the carrier is provided lengthwise with a central bore forming a well 30 communicating with the exterior at the rear end of the arm and extending well forward into the body of the arm, the forward end of the well communicating with the exterior by means of a reduced orifice 31 through the front wall of the well. The rear end of the well 30 is normally closed by a removable screw 32 which engages a corresponding thread provided on the wall of the well at this point. The well 30 is adapted to be packed with a suitable lubricating substance, such as non-fluid oil, which is introduced at the rear end by removing the screw 32 for the purpose, and is forced out by centrifugal action through the orifice 31 in reduced quantities when the carrier 13 is in motion, against the inner rim of the insulation ring 10 for lubricating the path of the contactor 23. The quantity of lubricant released by the orifice 31 is controlled preferably by a needle-valve 33 arranged within the well 30 in alinement with the orifice and movably mounted upon suitable bearings in the form of perforate disks 34, 34, arranged in spaced parallel relation within the well.

Forward movement of the valve, by centrifugal action, while the carrier 13 is in motion, is yieldingly opposed by an expansion spring 35 mounted on the valve and disposed between the bearings 34, 34, the rear end of the spring being opposed to the face of a fixed collar 36 carried on the valve stem. The spring 35 is designed to exert sufficient force under normal speeds of the carrier to prevent the valve from completely closing the orifice 31, and in such manner as to permit an adequate amount of lubricant to be released for maintaining proper lubrication of the traveled surface of the insulation ring 10 and contacts 12, 12, etc. The given position of the disk bearings 34, 34, within the well is preferably maintained by removable spacing rings 37, 38, engaging the side walls of the well.

In the modified form of the lubricating portion of the rotor, illustrated in Fig. 6, I have provided a hollow plunger 39 movably mounted in the well 30 and having a reduced forward extension 40 arranged to project through a suitable opening in the front wall of the arm 22, said plunger and extension being provided with an absorbent core 41 of felt or other suitable material adapted to distribute the lubricant placed in the well upon the traveled surface of the ring 10, said plunger extension 40 being arranged to move forward into engagement therewith under the force exerted by an expansion spring 42 within the well.

I claim:

1. In an ignition timer, the combination with a casing and contact-elements mounted in the casing, of a rotary portion mounted to move in the casing and including a carrier, an arm provided on the carrier for successively establishing contact with the contact-elements, and a separate arm provided on the carrier for carrying a lubricant and for distributing the lubricant on the contact-elements.

2. In an ignition timer, the combination with a casing and contact-elements mounted in the casing, of a rotary portion mounted to move in the casing and including a carrier, a pair of arms carried on the carrier, one of the arms being adapted to successively establish contact with the contact-elements in the casing, and the other of said arms having an interior closable chamber for receiving a lubricant, and control-means regulating the distribution of the lubricant on the contact-elements.

3. In an ignition timer, the combination with a casing and contact-elements mounted in the casing, of a rotary portion mounted to move in the casing and including a carrier, and a pair of arms carried on the carrier, a spring-pressed contact carried by one of the arms and adapted to successively contact with the contact-elements in the casing, and the other of the arms having means for carrying and distributing a lubricant on said contact-elements.

4. In an ignition timer, the combination with a casing and contact-elements mounted in the casing, of a rotary portion mounted to move in the casing and comprising a car-

rier; a pair of arms provided on the carrier, each of said arms being extended at one end toward the contact-elements; a movable contact provided on the extended end of one of the arms for successively establishing contact with the contact-elements, and the other of said arms having an interior chamber for receiving a lubricant and a closable opening into the chamber for introducing the lubricant, and a separate opening communicating from the chamber with the exterior in the direction of the contact-elements; and a valve within the chamber for regulating the flow of the lubricant through said last-described opening.

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

EDWARD B. JACOBSON.

Witnesses:
JNO. J. WHITTLESEY,
LE ROY E. SHAW.