Dec. 16, 1924. 1,519,566

A. W. TIEFENTHALER

IGNITION TIMER

Filed April 5, 1923

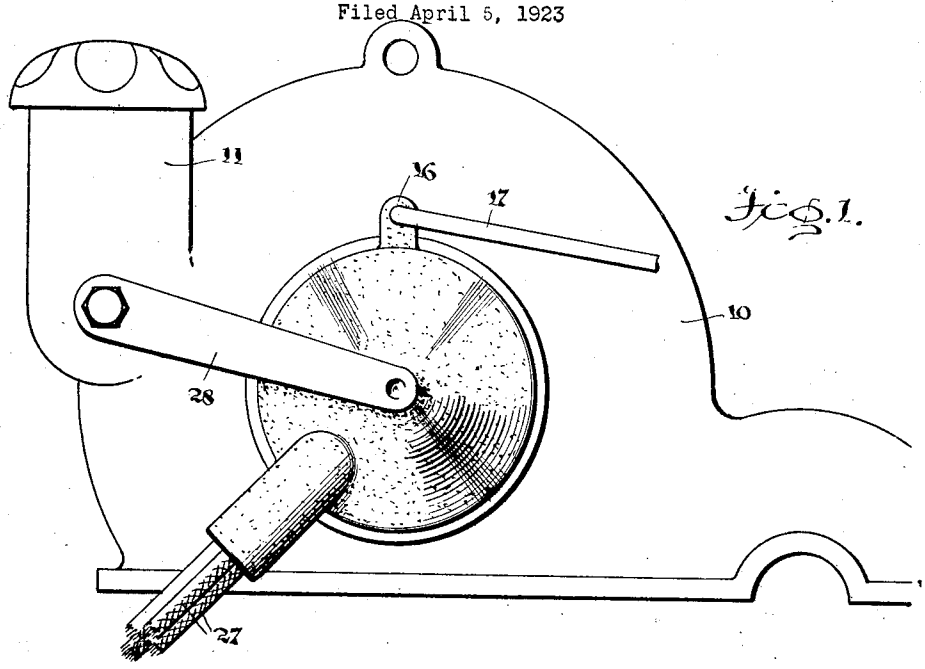


Fig. 1.

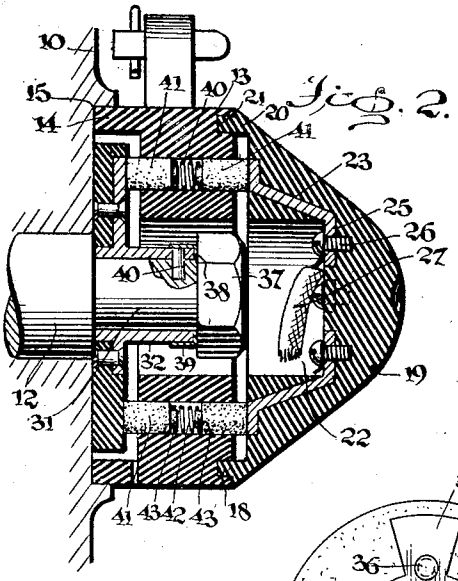


Fig. 2.

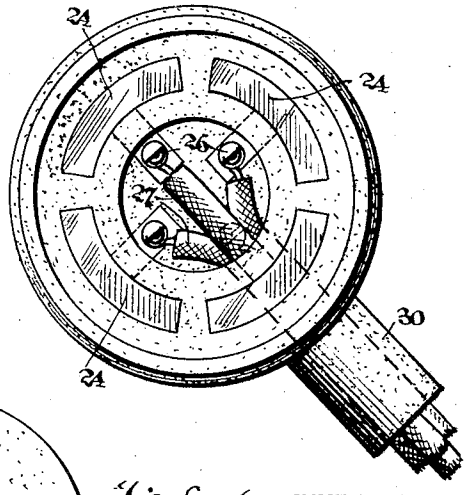


Fig. 3.

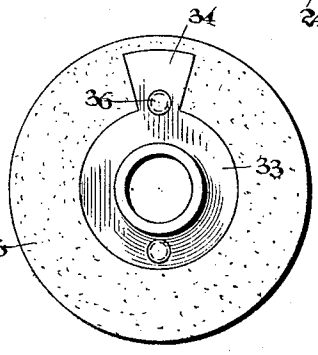


Fig. 4.

WITNESSES

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Patented Dec. 16, 1924. 1,519,566

UNITED STATES PATENT OFFICE.

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IGNITION TIMER.

Application filed April 5, 1923. Serial No. 630,129.

To all whom it may concern:

Be it known that I, ANDREW W. TIEFENTHALER, a citizen of the United States, and a resident of Anaconda, in the county of Deerlodge and State of Montana, have invented certain new and useful Improvements in Ignition Timers, of which the following is a specification.

This invention relates to improvements in ignition timers for internal combustion engines.

The general object of the invention is to provide a timer of the above character which is exceedingly simple and durable in structure; which has a minimum of wearing parts; which will operate to positively insure the making and breaking of the circuits controlled thereby; and which may be easily assembled or dissembled.

Other objects, and objects relating to details of construction, combination and arrangement of parts will hereinafter appear in the detailed description to follow.

The present invention is particularly adapted for use on motor vehicles of the Ford manufacture and so illustrated in the accompanying drawings, in which:—

Figure 1 is a partial front elevation of an internal combustion engine and showing the present invention applied.

Figure 2 is a vertical central sectional view taken through the timer of the present invention.

Figure 3 is an inside elevation of the terminal carrying cap employed in the present timer; and

Figure 4 is a similar view of the distributing disk of the present timer.

Referring to the drawings more particularly, 10 indicates a portion of the casing of an internal combustion engine and 11 the so-called "breather" and 12 the cam shaft journaled by the engine housing or casing 10 and which is usually employed for rotating the movable element of a timer.

In carrying out the present invention, there is provided an annular body member 13 which is made of insulated material, such as hard rubber or the like, which is formed upon its inner face with an annular extension 14 adapted to turnably fit within a circular recess 15 formed in the surface of the casing 10. The body member 13 is also provided with the usual radial extension 16 to which there may be secured in any convenient manner the one end of a control 17, whereby the member 13 may be rotated for a purpose which will later become apparent.

The outer face of the member 13 is provided with an annular groove 18 which occurs adjacent the outer periphery of the member 13. A terminal carrying cap is provided generally indicated by the reference numeral 19, said cap being preferably conical in shape and having its inner face formed with an annular extension 20, said extension occurring about the outer periphery of the face and formed with an annular protrusion 21 adapted to fit within the groove 18 of the member 13 and thereby to support the cap 19 and also to permit relative movement between the member 13 and cap 19. The inner face of the cap 19 is also provided with a recess 22 which may be of any shape desired. The cap 19 is preferably made of hard rubber or the like, and in forming the same has cast therewith a plurality of terminal or contact elements 23 which are preferably of brass, and each element 23 terminating at its outer end in a head 24 which is longitudinally arcuate in shape and which is embedded in the inner face of the cap. The heads 24 or electrodes should be spaced approximately as shown. The elements 23 may be of any number desired. In the present instance four of these members are shown, and the outer end of each member is formed with a lateral extension 25 which is embedded in the top 19, and each extension has a screw 26 threaded therethrough. Each screw provides a means whereby a lead 27 from an engine cylinder spark plug may be connected therewith. The usual resilient strap 28 is extended between the breather 11 and cap 19 and thereby to hold the cap in position. The cap 19 is also formed with a nipple 30 which communicates with the recess 22 of said cap and through which the leads 27 may be extended.

The cam shaft 12 is provided with a re-

duced portion 31 at its free end, said reduced portion having fitted thereon a sleeve 32 which is preferably of brass. This sleeve 32 has formed therewith an annular flange 33, said flange being provided with a radial projection or electrode 34. Between the flange 33 and the shoulder of cam shaft 12 provided by the reduced portion 31 there is interposed an annular disk 35 which may be of hard rubber or the like, and the flange 33 is secured to said disk by rivets or the like as at 36. The reduced portion 31 of the cam shaft has threaded upon its free end a nut 37, said nut abutting an inturned flange 38 of the collar 39, said collar 39 being fitted upon the sleeve 32 and adapted to hold a pin 40 in position, said pin extending through the sleeve 32 and into the cam shaft 12 whereby to hold the sleeve 32 against rotation upon said cam shaft.

The member 13 is provided with a plurality of transverse openings 40, said openings being arranged in circular formation so that they may register with the electrodes 23. The electrode 34 upon rotation of the cam shaft 12 will successively be brought into register with the openings 40. In each opening 40 there is slidably positioned a pair of carbon brushes 41 and between each pair of carbon brushes there is interposed a compression spring 42. Also each carbon brush may have its one end provided with a reduced portion or protrusion 43 which the compression spring is adapted to encircle.

The present timer when used in connection with the convention form of timing system employed on "Ford" motor vehicles is for the purpose of making and breaking at proper intervals a circuit through each of the primary induction coils. As is well known in this arrangement, one side of the generator or magneto is grounded. With this arrangement, one end of each primary coil could be connected with the source of current supply, that is, the magneto or generator and the other end of the coil connected to one of the leads 27. With the rotation of the cam shaft 12 these leads will be successively connected to the electrodes 24, brushes 41, and electrode 34 with the ground or the common return to one side of the generator or magneto. The lever 17 can be manipulated in the usual manner for timing the moment when the electrode 34 will be connected with each of the electrodes 24.

While I have shown and described the preferred form of my invention, I wish it to be understood, that the general arrangement, combination and construction of parts may be changed by those skilled in the art without departing from the spirit of the invention, as indicated by the appended claims.

I claim:

1. A timer comprising a circular body member having an inner and outer face or ends, a cap of insulating material arranged adjacent the outer end of said body member and having an inner flat face, a plurality of electrodes arcuate in shape and imbedded upon the inner face of said cap, said electrodes being arranged in circular formation and each electrode being provided with an extension for connecting a terminal wire therewith, a rotatable disk arranged adjacent the inner end of said body member, said disk being of insulating material and carrying a contact member concentric with the electrodes of the cap, a plurality of openings in the body member arranged in circular formation and registering with the electrodes of said cap, a pair of brushes slidable within each opening of said body member, and a compression spring interposed between each pair of brushes whereby the same will be forced against the face of said cap and disk and thereby to cause an electrical connection to be successively established between each electrode and the contact carried by said disk with the rotation of the disk.

2. A timer comprising a circular body member having an inner and outer face or ends, a cap of insulating material arranged adjacent the outer end of said body member and having an inner flat face, a plurality of electrodes arcuate in shape and imbedded upon the inner face of said cap, said electrodes being arranged in circular formation and each electrode being provided with an extension for connecting a terminal wire therewith, a rotatable disk arranged adjacent the inner end of said body member, said disk being of insulating material and carrying a contact member concentric with the electrodes of the cap, a plurality of openings in the body member arranged in circular formation and registering with the electrodes of said cap, a pair of brushes slidable within each opening of said body member, a compression spring interposed between each pair of brushes whereby the same will be forced against the face of said cap and disk and thereby to cause an electrical connection to be successively established between each electrode and the contact carried by said disk with the rotation of the disk, and means whereby the body member may be rotated whereby to change the moment when contact is established between each electrode and contact carried by said disk.

3. In a timer of the character described, comprising an annular body member made of insulating material, means whereby said member may be rotatably supported, a cap connected to the one side of said body member, said cap being adapted to permit free turning movement of the body member and said cap having an inner flat face and being of insulated material, a plurality of electrodes embedded upon the inner face of said cap, each electrode being adapted to be connect-

ed to a conductor wire, a shaft rotatably supported axially to said body member, a disk of insulating material carried by said shaft and arranged adjacent the other side of said body member, a contact member carried by said disk, said body member having a plurality of openings, one for each of the electrodes and arranged concentric with said electrodes and said contact member carried by the disk, a pair of brush members slidable within each opening, and a compression spring interposed between each pair of brush members.

ANDREW WILLIAM TIEFENTHALER.