

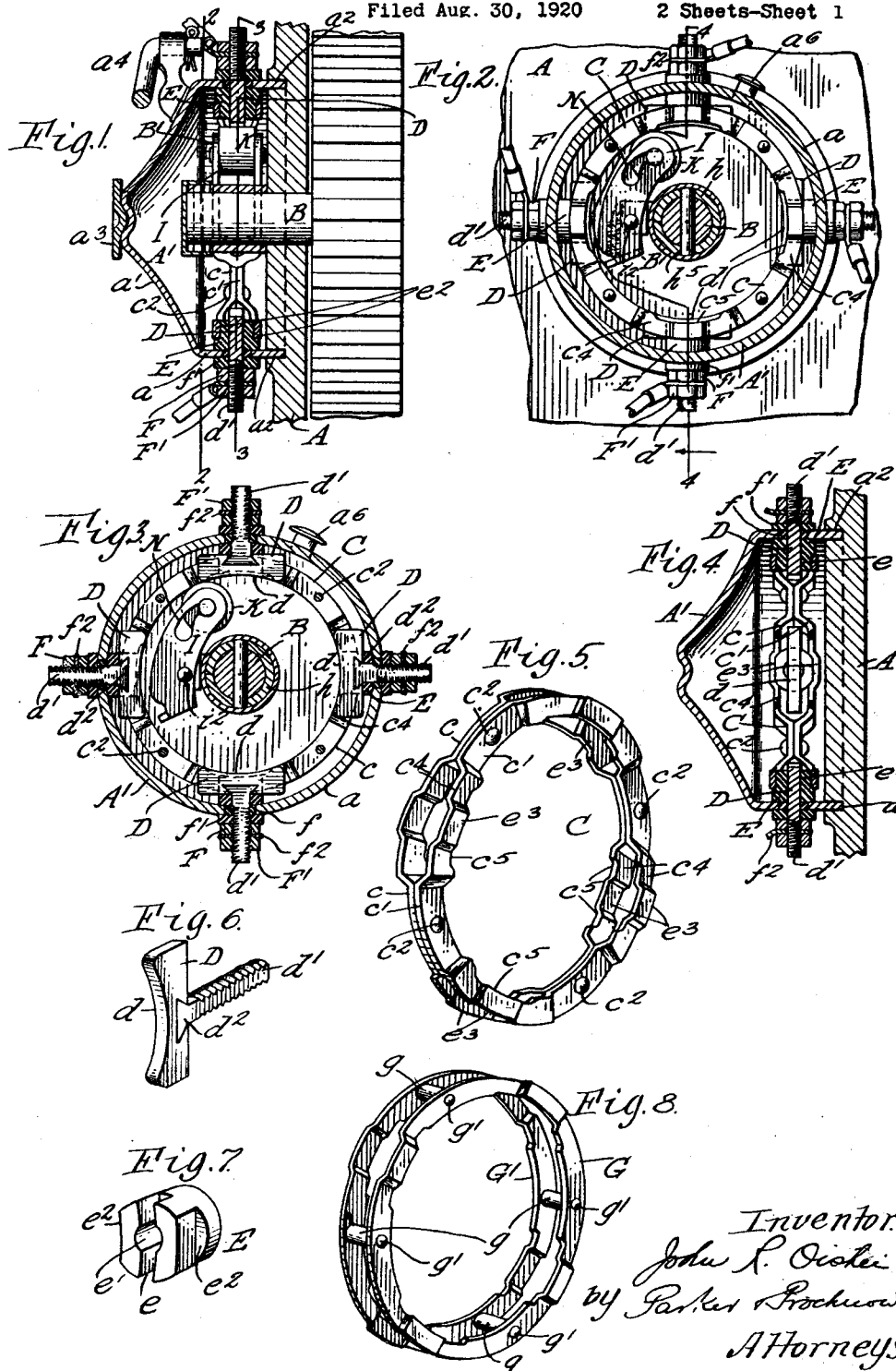
July 28, 1925.

1,547,261

J. R. OISHEI
ELECTRICAL TIMER

Filed Aug. 30, 1920

2 Sheets-Sheet 1



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July 28, 1925.

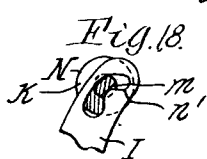
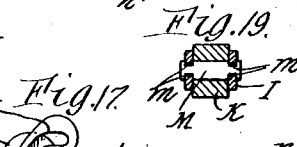
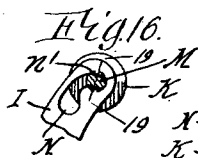
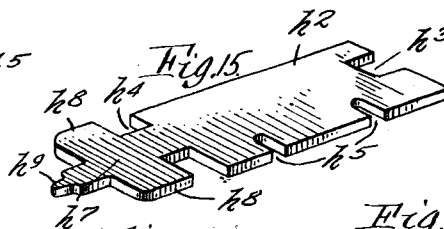
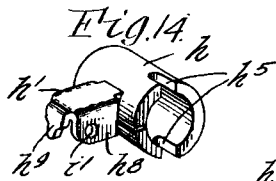
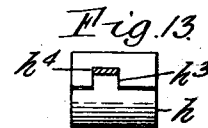
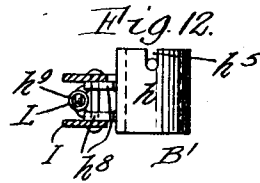
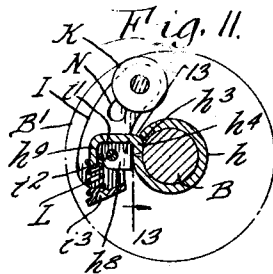
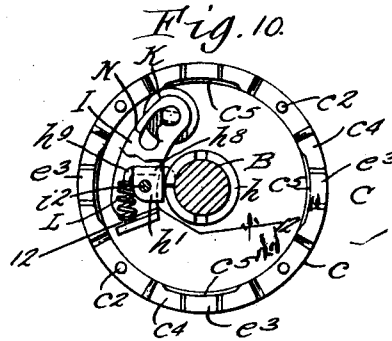
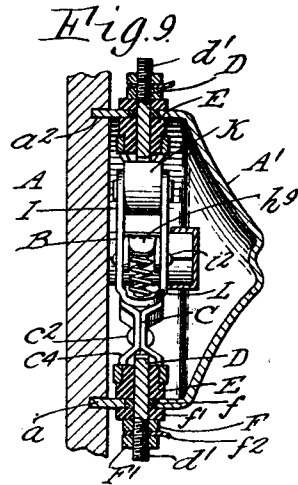
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ELECTRICAL TIMER

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

JOHN R. OISHEL, OF BUFFALO, NEW YORK.

ELECTRICAL TIMER.

Application filed August 30, 1920. Serial No. 406,778.

To all whom it may concern:

Be it known that I, JOHN R. OISHEL, a citizen of the United States, residing at Buffalo, in the County of Erie and State of New York, have invented a new and useful Improvement in Electrical Timers, of which the following is a specification.

This invention relates to timing devices of the kind used in connection with the ignition circuits of internal combustion engines to control the time of sparking in the engine cylinders.

In some types of timers as heretofore made, a rotary brush or contact member rolls along a fiber or non-metallic insulating ring which is provided at intervals with stationary, metallic contacts with which the brush is adapted to contact to close circuits to the several spark plugs of the engine. These fiber rings wear unevenly, creating depressions in the fiber, which depressions eventually become so pronounced as to cause the brush to jump over the contacts and thus prevent the proper operation of the device. When this occurs in timers as now made, the timer must be replaced by a new one since this defect cannot be economically repaired.

Some of the objects of this invention are to provide a timer of this kind with a ring or track, preferably a metal track suitably insulated from contacts, which greatly increases the life of the timer; also to provide a ring or track of this kind which is constructed and removably held in the shell or housing of the timer so that the ring can be readily replaced at small expense when worn; also to construct and removably secure the contacts on the timer so that they can also be readily and cheaply replaced when worn or damaged without necessitating a new track ring or housing.

Other objects are to provide a brush or traveling contact for a timer having a body portion made of sheet metal formed into the required shape; also to make the roller housing of the brush of a piece of sheet metal suitably shaped; also to provide means for removably holding the contact roller on the brush housing.

The invention also aims to improve timers in other respects hereinafter specified.

In the accompanying drawings:

Fig. 1 is a longitudinal sectional elevation of an ignition timer embodying the invention.

Fig. 2 is a transverse sectional elevation thereof on line 2—2, Fig. 1.

Fig. 3 is a transverse section thereof on line 3—3, Fig. 1.

Fig. 4 is a longitudinal sectional elevation thereof on line 4—4, Fig. 2.

Fig. 5 is a perspective view of a ring or track along which the contact brush travels.

Fig. 6 is a perspective view of one of the contact devices of the timer.

Fig. 7 is a perspective view of one of the insulating bushings of the timing device.

Fig. 8 is a perspective view of a ring or track of modified construction.

Fig. 9 is a longitudinal central sectional elevation of the timer showing the movable contact member or brush in elevation.

Fig. 10 is a transverse view of the movable contact member and the ring or track removed from the timer.

Fig. 11 is a central sectional elevation of the movable contact member.

Fig. 12 is a sectional view thereof on line 12—12, Fig. 10.

Fig. 13 is a sectional view thereof on line 13—13, Fig. 11.

Fig. 14 is a perspective view of the body portion of the movable contact member.

Fig. 15 is a perspective view of a metal blank from which the body portion of the movable contact member is made.

Figs. 16, 17 and 18 are views showing how the contact roller of the brush or movable contact member may be removed from its housing.

Fig. 19 is a section thereof on line 19—19, Fig. 16.

Fig. 20 is a perspective view of the bearing pin for the contact roller.

Fig. 21 is a perspective view of the roller housing of the brush.

The invention is shown in the accompanying drawings as applied to timers of the kind used on Ford automobiles, but it is not intended to limit the invention to such use, since the same may be applied to other types of timing devices.

A represents the usual base on which the timer is mounted and A' the usual shell or housing of the timer, which is preferably made of metal and is of cup shape, having an annular wall a . The outer edges of the wall a are preferably seated in an annular groove a^2 formed in the base A and the shell is held on the base A by means of the usual spring clamp a^3 . The shell may be turned

in the groove to advance or retard the spark, as by means of a rod a^4 , Fig. 1, suitably connected with the shell and with the spark control lever of the vehicle. Oil or
 5 other lubricant may be admitted to the timer by means of an oil inlet a^5 , preferably located in the annular wall a of the shell. The brush or movable contact B' of the timer is mounted on a rotary shaft B arranged concentrically with reference to the
 10 shell and extending into the shell through the base A . All of these parts have heretofore been used in connection with timing devices and of themselves form no part of this invention and the improvements embodying this invention may be used in connection with these parts without necessitating any changes therein.

In accordance with this invention the
 20 usual fiber track or ring on which the movable contact member or brush B' travels is replaced by a metal track C supported within the shell or housing A' , and the inner face of which is formed to provide a circular guide on which the movable contact member travels when the same is not
 25 engaging the stationary contacts. This track may consist of one or more metallic rings, two being shown in the construction illustrated. These rings are preferably so
 30 formed that stationary contacts D may be spaced and insulated from the track but in operative relation thereto, so that the movable contact member may pass from the
 35 track onto the stationary contacts and vice versa while moving in a substantially true, circular path. In the construction shown in Figs. 1 to 5 inclusive, the two track rings
 40 c and c' are secured together at intervals by any suitable means, such, for example, as rivets c^2 . Both rings are provided with opposite outwardly offset portions c^4 which form loops or spaces in which the contacts
 45 D are arranged. The end faces d of the contacts D are curved so as to form with the inner edges of the rings c and c' a substantially continuous circular guideway for the movable contact device. The walls extending between the portions c' and c^4 as illustrated in Fig. 5, are at an angle with respect
 50 to these portions, these portions being as illustrated substantially parallel, whereby a diagonally disposed edge is provided which will remove the excess oil or grease which
 55 may have collected on the contact roller, thus keeping the roller free from unnecessary lubricant and providing a good contact between the roller and the contact segment. This is particularly desirable in cold
 60 weather as the congealed oil or grease on the roller surface in the ordinary commercial timers will frequently prevent the proper breaking of contact in starting the car and thereby prevent the proper sparking. This
 65 excess oil or grease, which is scraped off of

the roller, discharges through the spaces between the rings c and c' . In order to insure a good contact between the movable and stationary contacts, the inner faces of the rings c and c' are recessed or depressed at
 70 c^5 at opposite sides of the contacts D so that the movable contact member will engage only with the contact members when passing over the recessed portions of the rings.

The stationary contact members D may
 75 be of any suitable or desired construction, those shown preferably being in the form of flat plates arranged edgewise with reference to the axis of the timer, the inner edge d being curved as described. Each contact member is provided with an attaching
 80 portion or threaded stem d' which may be formed integrally therewith, or, as shown in the drawings, may be detachably connected therewith, for example, by means of a dove-tailed head d^2 on the stem d' fitted in a corresponding dove-tailed recess in the contact
 85 member. By means of this arrangement the contact piece D may be made of material best adapted to withstand the arcing to which the contacts are subjected and the
 90 stem d' may be made of other conducting material. This construction also enables the contact pieces D and stems d' to be made cheaply and with little waste from metal
 95 stampings.

The guide track C and the contacts D may be held in place in the shell A' in any suitable manner. In the construction shown for this purpose, a plurality of spacing members or insulators E are provided, each having a slot e adapted to receive one of the contact members D , and a hole e' through which the stem d' of the contact member extends.
 100 The insulators extend into the loops of the track C and are provided at opposite sides with seats e^2 on which the track rings are supported. The loops of the tracks C extending on opposite sides of the insulators E also prevent swelling or distortion of these
 105 insulators. These loops provide in effect straps disposed on the opposite sides of the insulators and, due to this strapping action, the swelling or distortion which is frequently caused in the present commercial type of
 110 fiber ring timers is prevented, thereby insuring a regular travel of the contact roller and preventing irregularities in the path of the roller. These insulators are held in place on the housing by means of the contacts D , the
 115 stems of which pass through holes in the shell A' and are secured by nuts F . The stems and nuts are insulated from the shell by suitable means, such as washers f and f' of insulating material. The current may be
 120 conducted from each contact member D by means of a conductor f^2 which is suitably clamped on the stem d' by a nut F' or the like. The nuts F and F' securely hold the
 125 contact members in the bottoms of the slots
 130

of the insulators and also clamp the insulators rigidly in place on the shell of the timer.

The track C is held in place on the seats e^2 of the insulators E and in order to prevent the track from shifting relatively to the insulators, the track rings c and c' are preferably provided with offset portions e^3 into which the insulators fit and which hold the rings from moving circumferentially in the shell. Any other means for holding the guide track and the stationary contacts in place in the shell and insulating the contacts from the track and shell may be provided.

A guide track of modified construction is shown in Fig. 8, in which two rings G and G' are provided, which are spaced apart by spacing tubes g through which rivets g' extend. These rivets secure the two rings to the spacing tubes. In other respects these rings substantially correspond to the rings c and c' described.

By means of the guide track and contact devices arranged as described, a much longer life of the timer is ensured. The track may be made of hardened metal which resists the wear due to the movable contact member to a much greater extent than the fiber tracks heretofore used. The contact members D are so arranged in the timing device that they can be easily removed in case they become worn, and can be replaced by new contact members at a very small expense, and without removing the track or requiring a new track. The insulators or spacing members E serve to properly position the track in the shell A' and facilitate the assembling of the device and at the same time insulate the contacts from the track and shell. It is not necessary, however, to insulate the track from the shell since the timer will operate successfully if the track is secured directly to the shell, provided the contacts are insulated from the track and shell. By disposing the oil inlet a^6 at the point indicated, lubricating oil may be introduced directly in the path of the contact roller through the spacings between the two rings c and c' . This insures a proper oiling of the apparatus with a minimum quantity of oil as it is unnecessary to depend upon a certain amount of oil being deposited in the bottom of the casing to be picked up by the roller in its passage.

The movable contact member B', which is mounted on the shaft B and rotated thereby, may be of any suitable kind, but it is preferably constructed as follows:

It includes a body which is mounted on the shaft B, and is preferably made of a single piece of sheet metal stamped and formed to provide a tubular portion adapted to encircle the shaft B, and an outwardly-extending projection h' . Fig. 15 shows a blank from which the body portion may be formed,

this blank having a part h^2 which is bent to form the tubular portion h , of the body, and which is provided at one end with a recess h^3 and at the other end with a neck portion h^4 , and at one side with a pair of notches h^5 . When the blank is bent to form the body the neck portion h^4 enters into the recess h^3 and then extends outwardly therefrom, and the two notches h^5 are disposed opposite to each other to receive a pin for securing the body portion on the shaft B. The neck portion h^4 extending into the recess securely holds the two abutting ends of the tubular portion of the body in correct relation to each other and strengthens the body. The blank is also provided with a head portion h^7 having oppositely extending arms h^8 and an outwardly projecting extension h^9 , these parts forming the projection h' of the body. The two arms h^8 and the extension h^9 are bent substantially at right angles to the head portion h^7 for purposes hereinafter specified.

The movable contact member also includes a housing I and a contact roller K journaled thereon, the housing being pivotally supported from the arms h^8 of the body portion of the contact member. The housing I is preferably also formed of a single piece of metal bent substantially into U-shape, forming outwardly extending arms between which the contact roller is journaled. The housing is provided with holes i registering with holes i' formed in the arms h^8 of the body projection and a pin or rivet i^2 extends through these holes to pivotally connect the housing to the body. The housing is also provided with a boss or projection i^3 preferably formed integrally therewith and which is adapted to cooperate with one end of a compression coil spring L to hold the same in place. The other end of the spring engages the extension h^9 of the body projection so that the spring tends to swing the housing about its pivot i^2 in such a manner as to press the roller K outwardly from the shaft B and hold it against the guide track C. The roller K may be journaled on the outer end of the housing I in any desired manner. It is considered desirable to provide a hardened steel bearing pin for the roller to turn on. If a pin of this kind is employed it is not possible to rivet the same in place on the housing in the usual manner and the following construction is therefore preferably employed.

M represents the bearing pin of hardened steel or the like which is preferably provided at each end with a pair of oppositely disposed segmental recesses m . The ends of the arms of the housing I are provided with angular slots N adapted to receive the pin, these slots having inner portions which are made large enough to permit the pin M to pass endwise through the same. The outer ends n' of the slots are reduced in size so

that they are only large enough to receive the recessed portions of the pin therein. In assembling the pin, roller and housing, the pin is inserted endwise into the largest portion of slots in the housing and is passed through the hole in the roller. The pin is then moved sidewise through the angles of the slots into the reduced portions n' thereof, where the pin will be held against endwise movement by the recesses m therein. When the parts of the movable contact device are in their operative positions as shown in Fig. 10, the pin is held in the reduced end portions n' of the slots by the pressure of the spring L, which holds the roller against the track and prevents the pin M from passing over the angles of the slots. The direction of the movable contact device B is also such that the engagement of the track C with the roller tends to hold the pin back in the reduced ends of the slots N. Preferably, the reduced ends of the slots hold the pin from turning in the housing so that the roller is forced to turn on the hardened pin, with the result that there is very little wear on the housing which is not hardened.

By means of the construction described, a strong and reliable brush or movable contact member is produced, which is also inexpensive to construct. This contact member has the advantage that the roller K thereof is easily removable from the housing so that if this roller becomes worn or damaged, due to the arcing, it can be easily removed from the timer and replaced by a new one. The bearing pin can also be readily replaced if necessary. The fact that the spring L acts under compression also produces a more reliable operation of the movable contact device and makes it possible to use a comparatively small and stiff spring which ensures a good contact between the roller K and the contacts D.

I claim as my invention:

1. In a timing device, the combination of an annular metallic track, contacts arranged laterally with reference to said track and insulated therefrom, and a movable contact device adapted to engage both said track and said contact members, said track having depressed portions arranged in operative relation to said contacts to cause said movable contact device to engage only said contacts when passing said depressed portions of the track.

2. In a timing device, the combination of a pair of metal rings arranged side by side and having portions which are spaced apart, contacts arranged in the spaces between said rings and insulated therefrom, and a movable contact member adapted to travel in engagement with said ring and to engage said contacts, said rings having parts adjacent to said contacts which are located out

of the path of movement of said travelling contact member, whereby said member does not engage said rings when it engages said contacts.

3. In a timing device, the combination of a housing, a contact member movable in a substantially circular path in said housing, a guide track for said contact member comprising two metal rings, stationary contacts arranged between said rings and with which said movable contact member is adapted to engage, insulating members having parts extending between said rings and insulating said contacts from said track and said housing, and attaching means securing said contacts to said insulating members and holding said insulating members in place in said housing.

4. In a timing device, the combination of a housing, a contact member movable in a substantially circular path in said housing, a guide track for said contact member comprising two metal rings, stationary contacts arranged between said rings and with which said movable contact member is adapted to engage, insulating members having parts extending between said rings and insulating said contacts from said track and said housing, said track having parts engaging said insulating members to hold said track against movement relatively to said insulating members, and means for holding said insulating members against movement in said housing.

5. A movable contact member for timing devices including a contact roller, a pin on which said roller is journaled and having portions of reduced diameter adjacent to its ends, and a housing on which said pin is secured, said housing having slots in which said pin is held and which are wider at one portion than at another whereby said pin may be inserted endwise into the slots through the wide portions thereof and held against endwise movement by the engagement of the reduced portions of the pin in the narrow portions of the slots.

6. A movable contact member for timing devices including a contact roller, a pin on which said roller is journaled and having portions of reduced diameter adjacent to its ends, a housing on which said pin is secured, said housing having slots in which said pin is held and which are wider at one portion than at another whereby said pin may be inserted endwise into the slots through the wide portions thereof and held against endwise movement by the engagement of the reduced portions of the pin in the narrow portions of the slots, and said slots having projections which hold said pin in the narrow portions of said slots when said contact roller is in operative position in the timing device.

7. In a timing device, the combination of

a pair of metal rings arranged side by side and having portions which are spaced apart, contacts arranged in the spaces between said rings and insulated therefrom, and a movable contact member adapted to travel in engagement with said ring and to engage said contacts.

8. In a timing device having a rotary contact member, the combination of an annular metallic track removably supported in position and on which said member travels, and metallic contacts arranged in the path of movement of said rotary contact member and insulating means between said track and said contacts at points out of the path of movement of said rotary contact member, whereby said rotary contact member engages only with metallic surfaces throughout its path of movement.

9. In a timing device having a rotary contact member, the combination of a continuous annular metallic track member on which said contact member travels, metallic contacts insulated from said track member and

removably supporting said track member in position and arranged in the path of movement of said rotary contact member whereby said rotary contact member engages only with metallic surfaces throughout its path of movement.

10. In a timing device having a rotary contact member, the combination of an annular track on which said member travels, said track having portions in the path of travel of the roller diagonally disposed to form cleaning edges for removing excess lubricant from said roller, and metallic contacts arranged in the path of movement of said rotary contact member and insulated from said track at points outside of the path of movement of said rotary contact member whereby said rotary contact member engages only with metallic contacts throughout its path of movement.

Witness my hand this 28th day of August, 1920.

JOHN R. OISHEI.