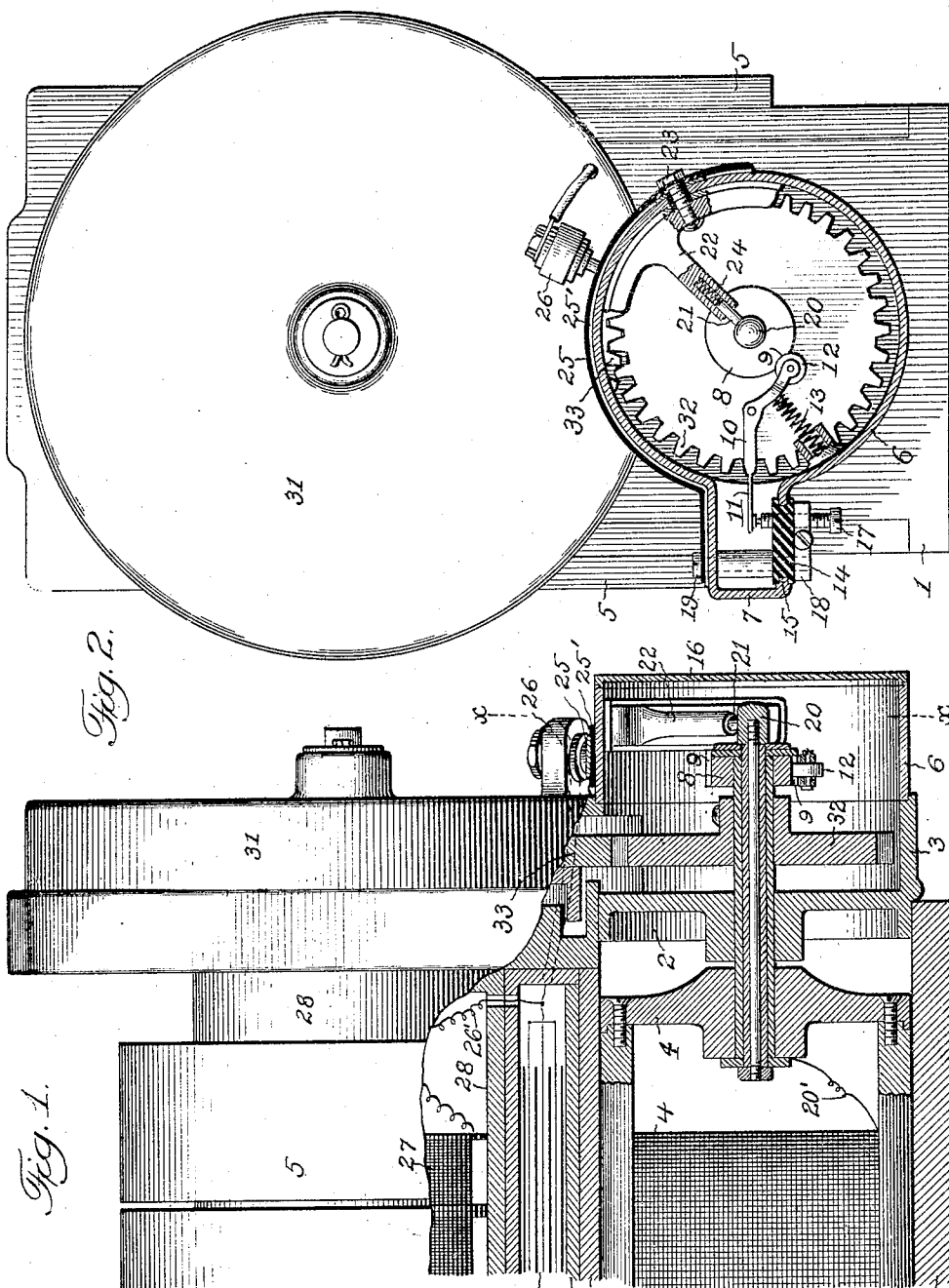


C. A. PFANSTIEHL.
CIRCUIT BREAKER FOR MAGNETO ELECTRIC MACHINES.
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Attest:
John Enders
Henry M. M.

Inventor: 1
Carl A. Pfanstiehl.
by Robert Burns
Attorney

UNITED STATES PATENT OFFICE.

CARL A. PFANSTIEHL, OF HIGHLAND PARK, ILLINOIS.

CIRCUIT-BREAKER FOR MAGNETO-ELECTRIC MACHINES

1,017,794.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Application filed April 18, 1910. Serial No. 556,245.

To all whom it may concern:

Be it known that I, CARL A. PFANSTIEHL, a citizen of the United States of America, and a resident of Highland Park, in the county of Lake and State of Illinois, have invented certain new and useful Improvements in Circuit-Breakers for Magneto-Electric Machines, of which the following is a specification.

This invention relates to the circuit breaking mechanism of the magneto-electric machine employed in the electrical ignition systems of internal combustion engines, and has for its object to provide a simple and efficient construction of parts whereby the electric current from the armature windings is collected and automatically interrupted at stated periods in the revolution of the armature to deliver an intermittent current to the induction coil and condenser of the system, all as will hereinafter more fully appear.

In the accompanying drawings: Figure 1, is a fragmentary elevation, with parts in longitudinal section, of a magneto-electric machine having the present invention applied. Fig. 2 is a transverse sectional elevation on line $x-x$, Fig. 1.

Similar reference numerals indicate like parts in both views.

Referring to the drawings, 1 represents the closed armature housing formed with a cylindrical bore for the reception of the armature, and adapted to afford a supporting base for the other portions of the machine, as usual.

2 is a bearing head secured in a removable manner to the front end of the bore of the housing 1 to admit of an assemblage of parts. In the present improvement said head is formed with a circular rim 3 on its forward side for housing the pinion by which the distributor of the system is driven, and said head and rim are capable of a turning adjustment upon the armature housing for the purpose hereinafter set forth.

4 is the armature above referred to, and which is of the usual H or spool shape and provided with a sectional carrying shaft journaled in the removable head 2 aforesaid, and in a companion head (not shown) at the rear of the housing 1.

5 are the vertical permanent or field magnets of the usual U shape, the depending legs of which embrace opposite sides of the

armature housing 1, and carry the usual pole pieces.

6 is a shell or casing secured to the forward end of the rim 3 aforesaid, so as to be capable of a turning adjustment therewith, as the parts are given a turning adjustment, manually or otherwise, to advance or retard the period at which the circuit is closed upon the induction coil with relation to the travel of the armature through the magnetic field of the apparatus. Said shell or casing 6 comprises a main circular portion and a lateral extension or pocket 7, and provides an elongated chamber for inclosing the circuit breaking mechanism hereinafter described.

8 is a cam disk secured to the forward end of the forward section of the armature shaft and arranged within the aforesaid casing or shell 6. Said cam disk will usually be formed with two equidistant peripheral depressions 9 for serially moving the vibrating member of the circuit breaker to close the circuit on the induction coil and condenser. And said depressions 9 are arranged to effect a movement of the circuit breaker in proper timed relation to maximum generation of E. M. F. by the magneto.

10 is the vibrating member or lever above referred to, pivoted at one end in an eccentric position in the shell or casing 6 aforesaid, and at the other end carrying a spring tongue or blade 11 and a contact button as shown.

12 is a roller carried at one end of the lever 10 and adapted to have bearing contact with the periphery of the cam disk 8 and operative engagement with the cam depressions 9 of the same.

13 is a spring tending to hold the roller 12 of the lever 11 to its bearing contact with the periphery of the cam disk.

14 is an elongated plug of insulating material secured in one of the side walls of the pocket 7 aforesaid, by grooves 15 in the edges of said plug engaging the margins of the opening formed in said wall for receiving said plug.

16 is a head or cover fitted to the front end of the casing 6 and holding the plug 14 in place.

17 is an adjustable screw passing through the plug 14 and constituting the stationary contact member or anvil of the circuit breaker.

18 is a plate of conducting material ar-

ranged upon the outside of the plug 14 and secured in place by a screw bolt 19 passing in an insulated manner through the pocket 7 of the casing 6, as shown. The adjustable screw 17 passes through the plate 18 so as to have electrical contact therewith.

20 is a contact arbor or hub upon the forward end of the forward section of the armature shaft, and have proper line connection 20' with the armature windings.

21 is a radial bearing plug arranged in the radial bore of an arm 22, the outer end of which is sector shaped and secured to the inner circular wall of the casing 6 by a screw bolt 23, hereinafter described. In such construction the arm 22 is in electrical contact with the casing 6, and the bearing plug 21 is yieldingly held to its contact with the revolvable arbor or hub 20 aforesaid, by a spring 24 arranged in the radial bore of the arm 22.

25 is a curved strip of metal secured in an insulated manner and by means of an interposed strip 25' to the outer side of the casing 6 and pocket 7, by the bolts 19 and 23, before mentioned. The bolt 19 forms an electrical connection between the strip 25 and the conducting plate 18, aforesaid, while the bolt 23 is insulated from said strip 25, and has only attaching connection therewith. The said conducting strip 25 constitutes the movable member of a conducting connection with the stationary post 26 which connects with the induction coil and condenser, and maintains conducting connection in the turning adjustment of the casing 6 heretofore described.

26' is a line conductor connecting the stationary post 26 with the induction coil and condenser of the apparatus.

27 is the induction coil preferably of the type which forms the subject matter of my prior Letters Patent No. 862,506, dated August 6, 1907, and 28 is the usual containing casing for said coil.

29 is the condenser preferably of the flat form shown and inclosed in a shallow containing tray or casing 30.

The induction coil 27 and condenser 29 with their containing casings are preferably arranged in superimposed relation above the armature housing 1, and within the arch of the field magnets 5, to afford a compact and self contained electrical generating apparatus, as usual in the present type of apparatus.

31 is a casing arranged in front of the induction coil and condenser, and above the casing 6 aforesaid. Said casing 31 is adapted to contain the current distributing mechanism by which the high tension current from the induction coil and condenser is serially distributed to the series of sparking plugs or terminals of the internal combustion engines, as usual in the present type of apparatus.

32 is a pinion on the armature shaft having driving engagement with the gear wheel 33 of the aforesaid distributor.

As usual in the present class of apparatus, one side of the armature winding, induction coil and condenser, may be connected to the metal frame of the apparatus to form a ground return, while the opposite side of said members are connected in multiple, as shown, and include the make and break device formed by the vibratory member 10, 11 and fixed contact 17, heretofore described.

The operation of the apparatus is as follows: As the armature 4 nears the point of maximum generation of E. M. F. a cam depression 9 of the cam disk 8 rotating in unison with said armature, permits the vibratory contact member 10, 11, to momentarily close the normally open circuit of the apparatus, upon the condenser 28 and primary winding of the induction coil 27, and attain the generation of the usual secondary high tension current produced by the present class of apparatus.

Having thus fully described my said invention what I claim as new and desire to secure by Letters Patent, is:—

1. In a circuit breaker of the type herein described, the combination of an armature housing, a casing formed with a lateral pocket and adapted to have a turning adjustment on said housing, a cam disk arranged in said casing and receiving motion from the armature shaft, a movable contact lever pivoted in said casing and operatively engaging said cam disk, a plug of insulating material formed with marginal grooves engaging the margins of an orifice in a wall of the lateral pocket aforesaid, and a fixed contact member mounted on said plug and arranged in the path of the movable contact lever aforesaid, substantially as set forth.

2. In a circuit breaker of the type herein described, the combination of an armature housing, a casing formed with a lateral pocket and adapted to have a turning adjustment on said housing, a cam disk arranged in said casing and receiving motion from the armature shaft, a movable contact lever pivoted in said casing and operatively engaging said cam disk, a fixed contact member mounted in an insulated manner in a wall of the lateral pocket aforesaid and arranged in the path of the control lever aforesaid, an axially arranged arbor turning with the armature shaft and connected with the armature winding, a spring impelled contact plug contacting with said arbor, a radial arm carrying said contact plug and secured to the inside of the casing, a curved contact plate arranged in an insulated manner on the outside of the casing and electrically connected to the fixed contact aforesaid, and a conducting termi-

nal having sliding contact with said plate, substantially as set forth.

3. In a circuit breaker of the type herein described, the combination of an armature
5 housing, a casing formed with a lateral pocket and adapted to have a turning adjustment on said housing, a cam disk arranged in said casing and receiving motion from the armature shaft, a movable
10 contact lever pivoted in said casing and operatively engaging said cam disk, a plug of insulating material formed with marginal grooves engaging the margins of an orifice in a wall of the lateral pocket aforesaid,
15 a fixed contact member mounted on said plug and arranged in the path of the movable contact lever, an axially arranged arbor

turning with the armature shaft and connected with the armature winding, a spring impelled contact plug contacting with said
20 arbor, a radial arm carrying said contact plug and secured to the inside of the casing, a curved contact plate arranged in an insulated manner on the outside of the casing
25 and electrically connected to the fixed contact aforesaid, and a conducting terminal having sliding contact with said plate, substantially as set forth.

Signed at Highland Park, Ills., this 5th day of April 1910.

CARL A. PFANSTIEHL.

Witnesses:

NELLIE FITZGERALD,
HERBERT MOON.