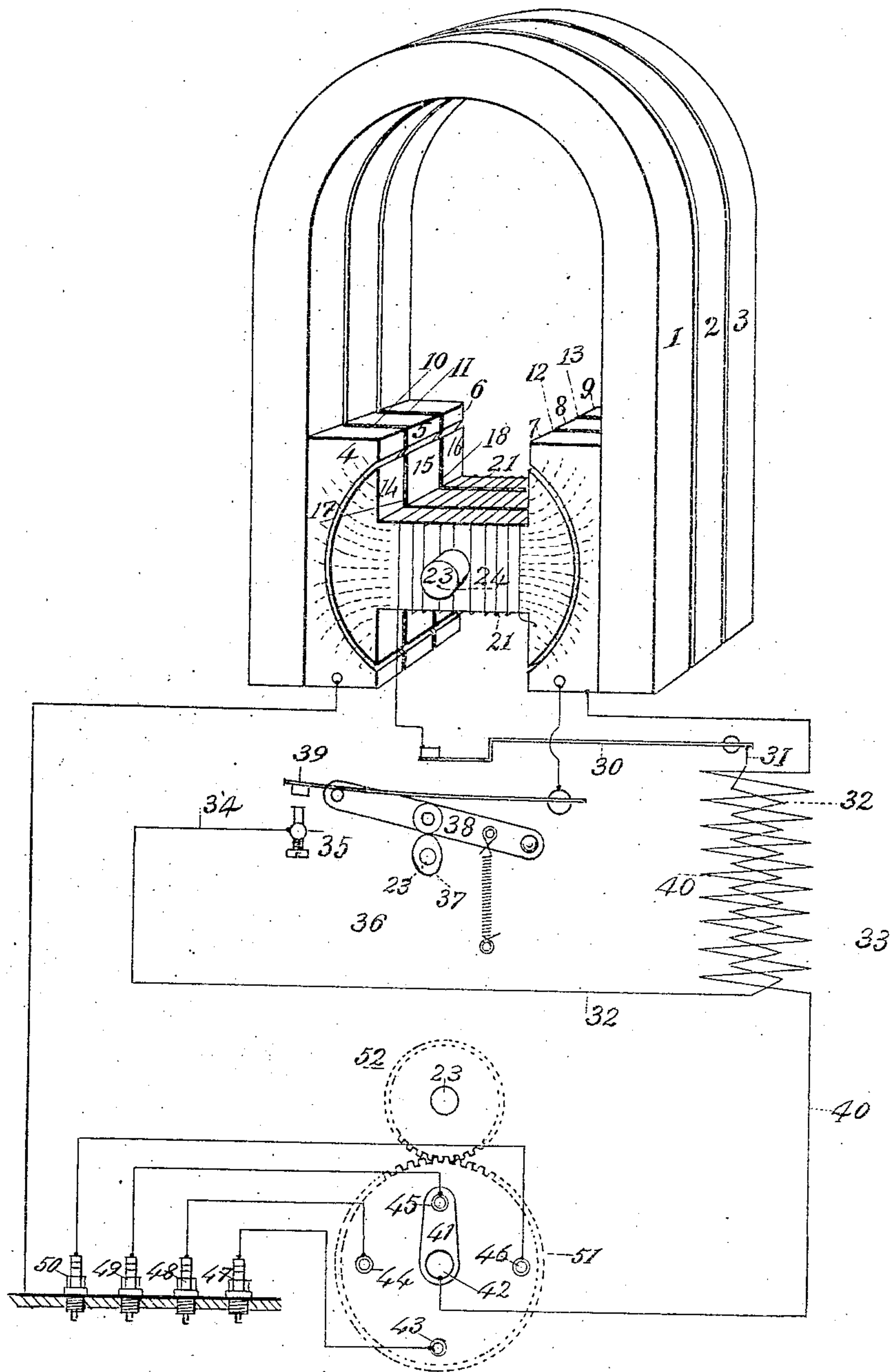


J. O. HEINZE, JR.  
DYNAMO ELECTRIC GENERATOR.  
APPLICATION FILED NOV. 11, 1907.

912,565.

Patented Feb. 16, 1909.



*Witnesses*  
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by his attorney  
Charles F. Richardson



# UNITED STATES PATENT OFFICE.

JOHN OTTO HEINZE, JR., OF LOWELL, MASSACHUSETTS.

## DYNAMO-ELECTRIC GENERATOR.

No. 912,565.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed November 11, 1907. Serial No. 401,559.

*To all whom it may concern:*

Be it known that I, JOHN OTTO HEINZE, JR., a citizen of the United States, residing at Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Dynamo-Electric Generators, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to dynamo electric generators, having permanent magnets.

The object of my invention is to provide means whereby, should one of the several magnets become demagnetized, the flow of magnetism from the other magnet or magnets would not only be prevented from passing through the deenergized magnet—which thus becomes a keeper or magnetic circuit closer for the magnetic circuits through the other magnet or magnets—but said flow would always pass to and through the armature, and not through the deenergized magnet. Hence should one of, say, eight magnets of the magneto, become deenergized, then there would be lost the magnetism of only one of the eight magnets. By the old form of construction, there would be lost not only the generating power of one out of the eight magnets, but said demagnetized magnet would form a short circuiting bar for the other seven magnets, and would partially shunt the magnetic circuit from passing through the armature, and would reduce the strength of the magnets, for example, to one half or less.

Now I attain the object of my invention by providing the magneto with a series of independent complete magnetic circuits; each of which has its own independent magnet, yoke, and armature, and is rendered independent of the other, by building up the armature, as well as the yoke of the magnets, with as many iron sections insulated from each other, as there are magnets.

The drawing shows a diagrammatic view of a generator embodying my invention, namely, a plurality of magnetically insulated, and hence independent, magnetic circuits; and a wiring plan commonly employed for distributing secondary currents to the ignition apparatus of an explosive engine, and with which my invention may be used to great advantage.

The drawing illustrates the principle of my invention, and the best mode I know of embodying that principle.

A reference to the drawing will greatly aid in a quick understanding of that principle. A plurality of permanent steel magnets, as 1, 2, 3, is provided, and they are connected together by a yoke built up of a corresponding plurality of iron sections, 4, 5, 6, 7, 8, 9, which, however, are magnetically insulated from each other by suitable non-magnetic material, as sheet brass 10, 11, 12, 13. An armature is likewise built up of a plurality of iron sections 14, 15, 16, also magnetically separated and insulated by such sheet brass 17, 18. This armature has the usual winding 21, which may form part of a primary winding 32 of an induction coil. The armature is mounted upon its shaft 23, which may be the main shaft of an explosive engine.

An inspection of the drawing shows that each magnet as 1, is independent of the magnetic influences of every other magnet, as 2 or 3, because its insulated yoke section 4, its insulated armature section 14, and yoke system 7, and no others have complete control over its magnetic field. The field of one magnet, as 1, may be of one strength; that of another, 2, or 3, of a different strength; and yet as these magnetic circuits are magnetically insulated, by insulations 10, 17, 12, and 11, 18, 13, the weaker magnet, as 1, cannot serve as a circuit closer to the stronger, as 2, or 3, and, in course of time, be overpowered, become de-magnetized, and serve as a shunt circuit, about the armature, and thus greatly to reduce the strength of the remaining magnetic current or currents passing through the armature.

My magneto may be used in many different environments, but it was designed especially for use in connection with explosive engines, and, as already stated, it is shown in the drawing as used in connection with apparatus for distributing the secondary or high tension current to four sparking devices, successively.

One end of the winding 21 of the armature is grounded, as to the armature, and its other end portion emerges, although not shown, from the center 24 of the armature shaft 23, from which the wire is insulated. A spring 30 contacts the exposed end of the wire, and is connected to one end 31 of the primary wire 32 of an induction or spark coil 33; the other end 34 of said primary wire being connected to an insulated contact 35, forming the anvil of a mechanical interrupter 36. On the armature shaft 23, shown



below the armature between the poles of the magnets, and disconnected, for the sake of clearness, is a cam 37 which upon each half revolution of the shaft, operates a lever 38 to  
5 move a spring hammer 39 of the interrupter, out of contact with its anvil, for the purpose of breaking the circuit in the primary wire; said wire being grounded, as to the yoke of the magneto. It is understood, of course, that  
10 the primary circuit is interrupted when the current is at its maximum intensity. One end of the secondary wire 40 is grounded, as to the yoke, and its other end is connected to a distributing arm 41 which is on a distribut-  
15 ing arm shaft 42, and which is moved into successive contact with terminals 43, 44, 45, 46, leading to spark plugs 47, 48, 49, 50.

The apparatus shown is supposed to be that used with a four cylinder engine, and  
20 two sparks are made during each revolution of the main shaft. Accordingly the distributing shaft and the main shaft are provided with two gears 51, 52, the number of teeth of which are in the ratio of 2 to 1, so  
25 that the distributing shaft 42 and hence the arm 41, will rotate once for each two revolutions of the main or armature shaft 23.

Having shown and explained the principle of my invention, and also the environment  
30 in which it may be used to advantage; and desiring to protect my invention in the broadest manner legally possible,

What I claim is:—

1. A series of permanent field magnets to-  
35 gether with corresponding iron armature

sections rotatable in their respective fields; each magnet and its iron armature section, being magnetically independent of its adjacent magnet and associated armature section, and lying in a plane parallel with that of its  
40 adjacent magnet and associated armature section.

2. A series of permanent magnets which are not in magnetic contact with each other; a rotatable armature made up of a corre-  
45 sponding number of iron armature sections mounted upon, and having a common axis with, an armature shaft; and not in magnetic contact with each other; all the north poles and all the south poles, of said mag-  
50 nets, being in parallel alinement with said axis; all designed to prevent magnetic short circuits from one magnet to the other.

3. A series of permanent magnets separated from each other by brass plates; a cor-  
55 responding series of iron armature sections separated from each other by brass plates, and mounted upon, and having a common axis with, an armature shaft; the like poles of said magnets being in parallel alinement  
60 with said common axis; and each armature section being rotatable in the field of its respective magnet.

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

JOHN OTTO HEINZE, JR.

Witnesses:

ALICE I. CRAWFORD,  
ELIZABETH F. UNIAC.