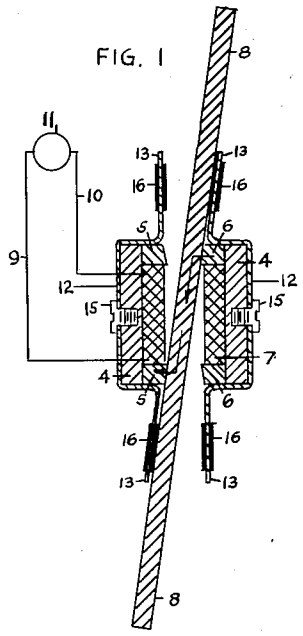
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ELECTRIC GENERATOR

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FIG. 3

FIG. 1



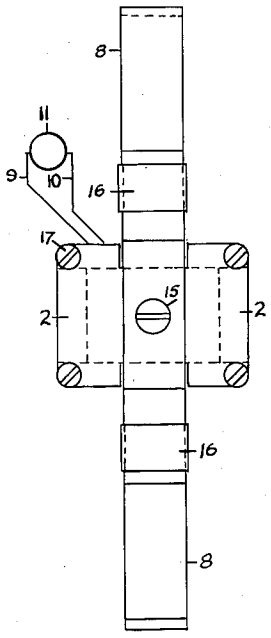
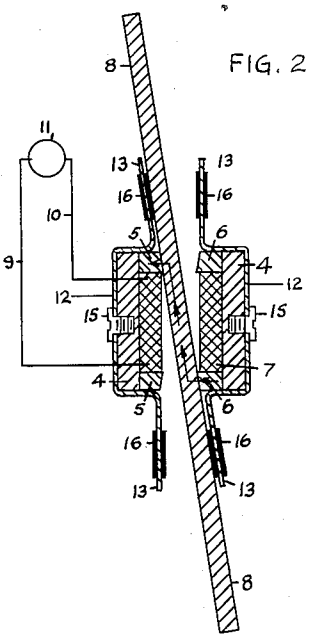


FIG. 2



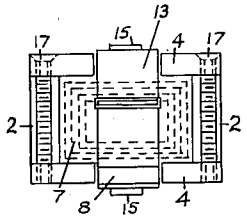


FIG. 4

INVENTOR.

ROBERT C. HARRIS

BY Barry & Cyr

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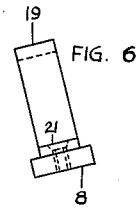


FIG. 6

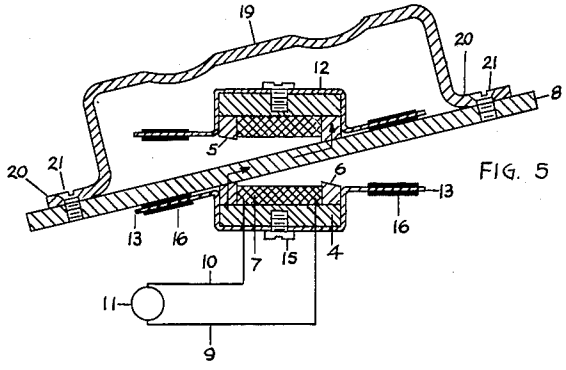


FIG. 5

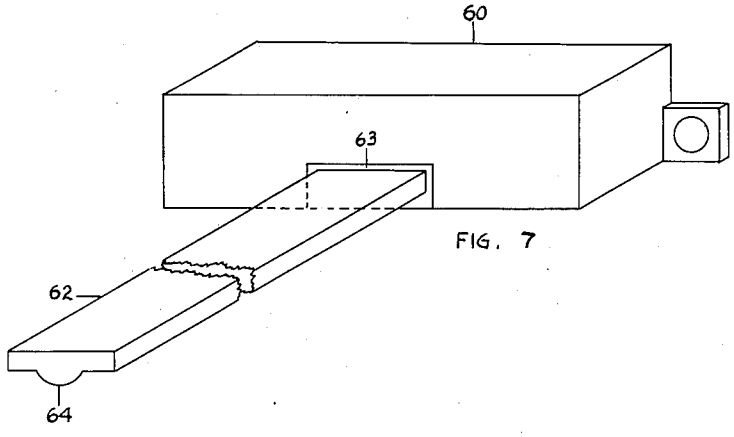


FIG. 7

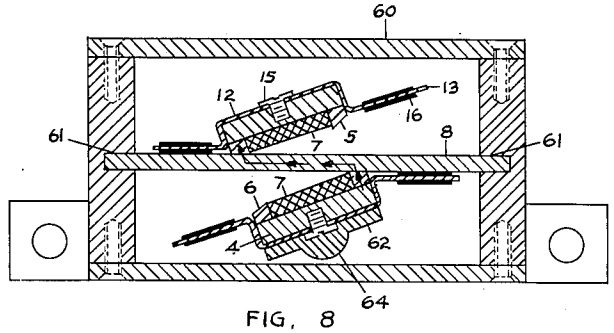


FIG. 8

INVENTOR.

ROBERT C. HARRIS

BY Barry & Gye

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UNITED STATES PATENT OFFICE

2,471,741

ELECTRIC GENERATOR

Robert C. Harris, Fort Wayne, Ind.

Application May 10, 1946, Serial No. 668,833

7 Claims. (Cl. 171—209)

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This invention relates to improvements in electric impulse generators, and more particularly to generators of the type wherein a sudden surge of current is produced by movement of a floating armature into and out of contact with diagonally opposite pole pieces of a permanent magnet, or by alternately contacting said diagonally opposite pole pieces of a movable magnet with a stationary armature.

In these types of generators, current is produced by movement of the armature away from two diagonally opposite pole pieces of the magnet and into contact with two other diagonally opposite pole pieces of said magnet, or by oscillating the magnet relatively to the armature to force two diagonally opposite pole pieces of said magnet away from a stationary armature and bring two other diagonally opposite pole pieces of the magnet into contact with said stationary armature. However, because of the strong magnetic force exerted upon the armature by the pole pieces with which it is in contact, it is sometimes very difficult to break the contact between the armature and one set of pole pieces and form a contact between said armature and another set of said pole pieces. It is therefore the primary object of my invention to provide means to assist in overcoming this magnetic pull exerted on the armature, thereby facilitating operation of the device.

A further object of my invention is to provide resilient means capable of adjustment for varying the force required to break the contact between said armature and the pole pieces of the magnet.

Another object is to provide means for cushioning the blow of the armature against the pole pieces when the armature is actuated, thereby saving wear and tear on the armature and pole pieces and at the same time deadening the noise normally occurring when the device is operated.

With the foregoing objects outlined and with other objects in view which will appear as the description proceeds, the invention consists in the novel features hereinafter described in detail, illustrated in the accompanying drawings and more particularly pointed out in the appended claims.

In the drawings:

Fig. 1 is a cross section of a device embodying my invention.

Fig. 2 is a similar cross section showing the armature in a position opposite to that shown in Fig. 1.

Fig. 3 is a side elevation.

Fig. 4 is an end view of the device.

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Fig. 5 is a horizontal sectional view showing one method of operating the device.

Fig. 6 is an end view of a portion of the device shown in Fig. 5.

Fig. 7 is a perspective view of a modification of my invention.

Fig. 8 is a horizontal sectional view of the device shown in Fig. 7.

Referring to the drawings in detail, 2 designates a permanent magnet or magnets having north poles 5 and south poles 6 secured to or formed integral with pole plates 4. The magnets are secured between the plates 4 by means of screws or the like 17. The plates 4 are preferably made of soft iron or other material of high magnetic susceptibility.

A coil 7 is mounted between the opposed pairs of pole pieces 5, 6, and an armature 8 extends through the coil and between said opposite pole pieces. As will be seen from Figs. 1 and 2, the armature is solely supported within the magnetic field by the magnetic force exerted thereon through diagonally opposite north and south poles and one, or both ends of the armature may extend beyond the pole pieces, for a purpose or purposes hereinafter described. Wires 9, 10 extend from opposite ends of the coil 7 for connection to the firing device, signal or the like, 11, to be supplied with an electrical load from the generator.

The armature may be moved by hand from the position shown in Fig. 1 to the position shown in Fig. 2, that is, into contact with one or the other of the respective diagonally opposite pole pieces 5 and 6 to produce the desired surge of current, or may be reciprocated either continuously or periodically, by any suitable motor or trigger mechanism connected to one or both extensions of the armature.

In Figs. 5 and 6, I have shown one form of manually operable means for reciprocating the armature. In this embodiment of the invention, I provide a handle member 19 having lateral extensions 20 secured to opposite ends of the armature by means of screws or the like 21. By grasping handle member 19 in one hand, the operator may rock the armature into and out of contact with diagonally opposite pole pieces of the magnet, thereby producing a surge of current each time the armature comes into contact with one set of said diagonally opposite pole pieces.

The same result may be accomplished by anchoring the ends of the armature in any suitable manner, as shown in Fig. 8, and rocking the magnet relatively to the armature, providing the

armature is made to contact diagonally opposite north and south pole pieces upon each rocking movement of the magnet. Here again, the desired action of the device may be accomplished by hand or by any suitable device (Figs. 7 and 8) capable of producing the required rocking action of the magnet relatively to the armature.

In Figs. 7 and 8, I have illustrated one method of operating the device by rocking the magnet relatively to a stationary armature. In this embodiment of the invention, the generator assembly is arranged within a box or casing 60 provided with grooves 61 in its end walls to receive the ends of the armature 8 and lock the latter in fixed position within the casing between the pole pieces 5 and 6 of the magnet. A treadle 62 is secured to the generator assembly and extends outwardly through an opening 63 in the casing. When a vehicle or the like passes over the projecting end of the treadle, the latter will be rocked on its pivot 64, which rocking movement will be imparted to the magnet assembly thereby causing first one set of the diagonally opposite pole pieces 5, 6 to contact the armature, and then the other set of said diagonally opposite pole pieces to contact the armature. Each time the treadle is rocked, and one set of diagonally opposite pole pieces is brought into contact with the armature, a surge of current will be produced and pass from the coil 7 through the wires (not shown) to the signal or device to be operated, which device or signal may be a light, bell, relay, or any unit requiring electric energy.

To facilitate actuation of the armature and/or the magnet, and to overcome the magnetic force exerted upon said armature by the diagonally opposite pole pieces, I provide a pair of members 12 having resilient extensions 13, adapted to bear against one face or the other of the projecting ends of the armature 8 when the latter comes into contact with the respective diagonally opposite pole pieces 5, 6. The members 12 are shaped to fit over the pole plates 4 and may be secured to the latter by welding or the like. In order to vary the effectiveness of the resilient members 13, upon the armature, the members 12 may be secured to the magnets by screws 15. By loosening the screws 15, thus enabling movement of the members 12 away from the magnet, the effectiveness of the parts 13 upon the armature will be lessened, and the effect of these resilient members upon the armature will be increased by tightening said screws.

While I prefer to have the members 12 made of metal, it will be understood that the same may be made of any other suitable material affording the desired resiliency in the extensions 13. However, when the members 12 are formed of metal, I prefer to use a rubber insert or strap 16 on the inner surfaces of the extensions 13 to cushion the blow against these extensions when the armature is snapped into contact with one or the other of the diagonally opposite pole pieces. With this arrangement of the members 12 and their resilient extensions 13, it will be understood that wear and tear on the armature and pole pieces will be greatly minimized, and at the same time, the device will be substantially noiseless in operation.

In operation, when force is exerted against the armature to swing the latter in a counter-clockwise or clockwise direction, as for example, from the position shown in Fig. 1 to the position shown in Fig. 2, or when the magnet assembly is rocked relatively to the stationary armature (Fig. 8), a sudden surge of current will be developed and pass from the coil through the wires to the signal or other device to be operated. The magnetic force acting upon the armature through the diagonally opposite north and south poles with which the armature is in contact will resist this movement. However, the resilient extensions on the members 12, bearing on opposite sides of the armature, will have a tendency to overcome this magnetic pull upon the armature and thereby facilitate movement of the latter or the magnet assembly from one position to the other. By adjusting the screws 15 and thereby moving the members 12 toward or away from the armature, it is possible to vary the spring tension exerted by the members 13 against the armature, whereby greater or less force will be required to reciprocate the armature or the diagonally opposite poles from one position to the other.

While I have disclosed what I now consider to be preferred embodiments of my invention, it will be manifest to those skilled in the art that various changes may be made in the details disclosed, without departing from the spirit of the invention, as expressed in the following claims.

What I claim and desire to secure by Letters Patent is:

1. An electric impulse generator comprising a member for providing a magnetic field, a second member supported in said field and through which the flux of the field passes in one direction or in the opposite direction dependent upon the position occupied by one member relatively to the other member, a coil inductively coupled to said second member, means for moving one of said members relatively to the other member for changing the direction of flux passing through said second member, and means on one of said members bearing against the other member and constantly tending to move one member relatively to the other member.

2. An electric impulse generator comprising a member for providing a magnetic field, a second member supported in said field and through which the flux of the field passes in one direction or in the opposite direction dependent upon the position occupied by one member relatively to the other member, a coil inductively coupled to said second member, means for moving one of said members relatively to the other member for changing the direction of flux passing through said second member, and resilient means on one of said members bearing against the other member and constantly tending to move one member relatively to the other member.

3. An electric impulse generator comprising a magnet for providing a magnetic field, an armature supported in said field and through which the flux of the field passes in one direction or in the opposite direction dependent upon the position occupied by the armature relatively to the magnet, a coil inductively coupled to said armature, means for moving said armature relatively to the magnet for changing the direction of flux passing through said armature, and resilient means on said magnet bearing against the armature and constantly tending to move the armature relatively to the magnet.

4. An electric impulse generator comprising a magnet for providing a magnetic field, an armature supported in said field and through which the flux of the field passes in one direction or in the opposite direction dependent upon the posi-

tion occupied by the armature relatively to the magnet, a coil inductively coupled to said armature, means for moving said armature relatively to the magnet for changing the direction of flux passing through said armature, and resilient means on said magnet bearing against opposite faces of the armature and constantly tending to move the armature relatively to the magnet.

5. An electric impulse generator comprising a magnet for providing a magnetic field, an armature supported in said field and through which the flux of the field passes in one direction or in the opposite direction dependent upon the position occupied by the armature relatively to the magnet, a coil inductively coupled to said armature, means for moving said armature relatively to the magnet for changing the direction of flux passing through said armature, resilient means on said magnet bearing against opposite faces of the armature and constantly tending to move the armature relatively to the magnet, and means for varying the tension of said last mentioned means against the opposite faces of said armature.

6. An electric impulse generator comprising a magnet having two pole pieces on each pole, an armature movable between said pole pieces, a coil inductively coupled to said armature, manually operable means connected to said armature for moving the latter into and out of engagement with diagonally opposite pole pieces of the magnet, and resilient means on said magnet bearing against the armature and constantly tending to break the contact between said armature and said diagonally opposite pole pieces of the magnet.

7. An electric impulse generator comprising a magnet for providing, a magnetic field, an armature supported in said field and through which the flux of the field passes in one direction or in the opposite direction dependent upon the position occupied by the magnet relatively to the armature, a coil inductively coupled to said armature, a pair of pole pieces on each pole of the magnet, means for rocking said magnet relatively to said armature for bringing diagonally opposite pole pieces into contact with said armature, and means on said magnet bearing against opposite faces of the armature and constantly tending to force said diagonally opposite pole pieces out of contact with said armature.

ROBERT C. HARRIS.

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