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W. H. PETERSÉN

2,687,481

MEANS FOR CREATING CURRENT IMPULSES

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Fig.1

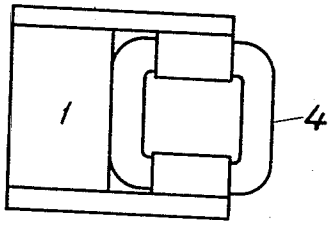


Fig.2

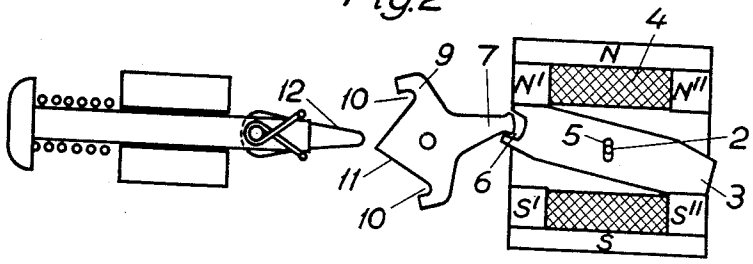


Fig.3

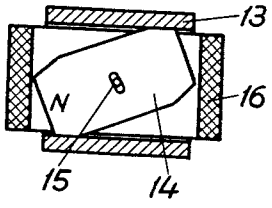
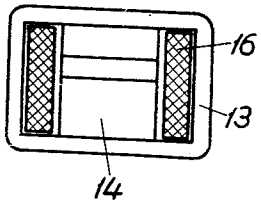


Fig.4



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MEANS FOR CREATING CURRENT IMPULSES

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4 Claims. (Cl. 310—15)

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It is known to create rapid current impulses for igniting explosives and the like by displacing a tiltable iron core in a coil in such manner with reference to a magnetic circuit, generally containing a permanent magnet, that the direction of the flux through the coil is reversed. The present invention relates to a device of this kind, which has the advantage that all the reversals of flux through the coil are created by identical manual operation, and therefore there is no reason for causing any reversals to succeed each other immediately, as would be the case if every second reversal were caused by a movement opposite to the other ones. Impulses obtained according to the present invention are particularly suitable for igniting the driving charge of rocket projectiles. Other features of the invention will be apparent from the following specification.

In the accompanying drawing there are shown, in part diagrammatically, two forms of the invention, one of these in two sections perpendicular to each other in Figs. 1 and 2 and the other in corresponding views in Figs. 3 and 4.

In Fig. 1, 1 designates a permanent magnet, to the ends of which there are secured two pieces of soft iron, the upper of which for instance represents a north pole and is designated by N and the lower a south pole and is designated by S. These pole pieces are shown in Fig. 2 as seen from the right hand side of Fig. 1. They have both at their ends projections N', N'' and S', S'' facing each other. Between these projections, an armature 3 is movable around a pin 2 so as to bear either against N' and S'' or against S' and N''. The armature cannot occupy any intermediate position on account of the strong magnetic forces. The armature forms the core of a coil 4, and by its displacement from one extreme position to the other the flux through the coil is reversed and thereby a current impulse is induced in the latter.

The hole 5 in the armature 3 for the pin 2 is somewhat oblong in section, which has the advantage that there will be a certain time interval between the separation of the armature from the north and from the south pole, whereby the force needed for the separation is reduced to about half of that necessary for a simultaneous separation. The motion of the armature is effected by a projection 7 on a member 9 rotatable on a pin 8, said projection engaging a recess 6 in one end of the armature. The member 9 has, on the side opposed to the projection 7, two recesses 10 separated by a ridge 11 which is influenced by a pressure member 12 in such manner that the direction of rotation of the member 9 is made dependent on its original position. In the position shown, the pressure member 12 strikes the ridge 11 somewhat above its highest point and follows the ridge down into the upper recess 10, whence it tends to rotate the member 9 clockwise.

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Although in Fig. 2 all the parts serving the maneuvering are for the sake of simplicity shown in one plane, the projection 7 is preferably in practice bent in a right angle, whereby it will be to a certain extent elastic and the instantaneous motion of the armature thereby facilitated.

Figs. 3 and 4 show a modification of the electromagnetic parts of the apparatus, in which the movable core is made from permanently magnetic material, while the stationary parts of the magnetic circuit are made from soft iron. Such a form is more efficient than that of Figs. 1 and 2 but cannot always be used, as many alloys for permanent magnets are so brittle that a core made therefrom runs the risk of being broken at the violent movements imparted thereto. Fig. 3 shows the device in section, as seen from the end of the axis of rotation of the core, and Fig. 4 the same as seen from the end of the core.

In Figs. 3 and 4, 13 designates the stationary portion of the magnetic circuit, made from soft iron, 14 the core forming a permanent magnet, 15 its supporting pin and 16 the winding. In the position shown of the core, if N designates its north pole, the flux will penetrate the coil from above, while in the other extreme position of the core it will pass from below. The return flux will divide itself between the two sides of the soft iron path. In the same way as in Figs. 1 and 2, therefore, a current impulse through the coil is induced which corresponds to a total reverse of the flux.

I claim as my invention:

1. Means for creating current impulses, comprising a magnetic circuit having oppositely arranged pole pieces of opposite polarity, a movable member arranged between said pole pieces, a round pin mounted between said pole pieces and pivotally supporting said movable member, an oblong hole in said movable member for the passage of said pin, the greater axis of said oblong hole extending crosswise of said movable member, a coil surrounding a portion of said magnetic circuit and so arranged that the magnetic flux penetrating said coil is reversed by displacement of said movable member from one extreme position to the other, a pressure member for operating said movable member, and a pivoted ridge-

shaped member engaging said movable member, said pressure member operating said ridge-shaped member to move the movable member in one direction or the other depending on the position of said ridge-shaped member.

2. Means according to claim 1, in which the movable member is a permanent magnet.

3. Electro-magnetic means for the creation of current impulses, comprising a magnetic circuit having opposed pole pieces of opposite polarity, a cross pin fixed between said pole pieces, a movable member mounted on said pin for movement into engagement with pole pieces of opposite polarity, a coil surrounding a portion of said magnetic circuit and so arranged that the magnetic flux penetrating said coil is reversed by displacement of said member from one extreme position to the other, means for so displacing said member as to reverse the magnetic flux, and an elongated

hole through said member for the passage of said pin to permit transverse as well as pivoting movement of the said member upon said pin to permit initial movement of one part of the member away from a pole piece without simultaneous disengagement of another part of the member from a pole piece of opposite polarity.

4. Means according to claim 3, in which the movable member serves as a permanent magnet.

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