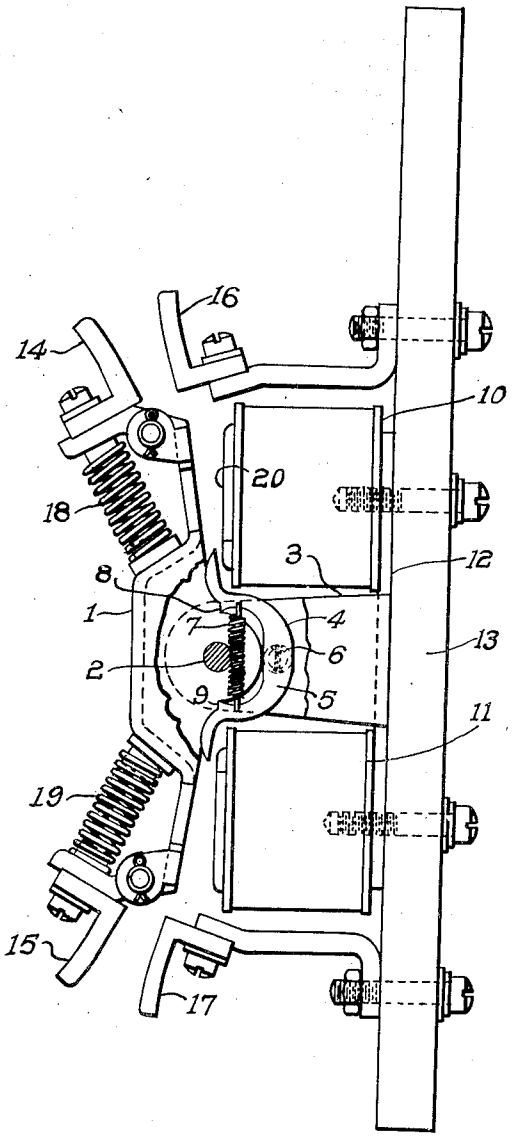
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1,680,416

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MAGNET SWITCH

Filed Jan. 22, 1924



WITNESSES:

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UNITED STATES PATENT OFFICE.

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MAGNET SWITCH.

Application filed January 22, 1924. Serial No. 687,721.

My invention relates to apparatus for controlling electric circuits and it has particular relation to electromagnetically-operable switches or contactors for controlling motors and the like.

An object of my invention is to provide a substantial and inexpensive reversing switch for motor control systems particularly, although its application is not limited thereto.

My invention will be described in connection with the accompanying drawing which is a view in side elevation, with parts broken away for clearness, of apparatus embodying my invention.

An armature 1, having a pair of magnetizable arms extending in opposite directions, is mounted upon an operating shaft 2, which is supported upon pedestal type bearings 3. The armature is normally maintained in its illustrated position by means of a pair of latching members 4 and 5, of substantially S-shape, which are mounted upon a common bearing 6 and are biased to the illustrated positions by means of a tension spring 7, the ends of which are respectively attached to intermediate portions of the latching members. These latching members are provided with trigger portions 8 and 9 for engaging corresponding notches in armature 1 to restrain movements thereof, as hereinafter more fully set forth.

Associated with the respective arms of the armature 1 are a pair of operating magnets 10 and 11, which are mounted upon a suitable base 12 of iron or other magnetic material and are supported upon an insulating panel 13. Two or more movable contact members 14 and 15 of usual type are mounted near the respective ends of the armature 1 and are designed to co-operate with corresponding stationary contact members 16 and 17. Suitable contact pressure is insured by means of compression springs 18 and 19, acting between the central portion of the armature 1 and the respective contact members 14 and 15.

Assuming the armature 1 in its illustrated inoperative position, if the upper operating magnet 10 is energized, the latch member 4 is first attracted into engagement with the upper pole piece 20, against the action of spring 7. The armature is, of course, simultaneously attracted and is now free to close and establish contact between the upper switch members 14 and 16. The latch member 4, on account of its construction and location with respect to the magnetic circuit, is very sensitive to magnetization and therefore, is actuated to release the armature before the latter has a tendency to operate.

When a reversal of operation is required, the upper magnet 10 is de-energized and the lower magnet 11 is energized. The lower latch member 5 is then attracted by the pole piece 11 and the armature is released from its upper closed position with a snap action, being projected by spring 18 towards its lower closed position, wherein contact member 15 engages contact member 17. This motion is completed by means of the lower operating magnet 11, which maintains the switch in its proper operating position.

When the lower magnet 11 is de-energized, the contact spring 19 actuates the armature to its intermediate position, where it is again latched as illustrated in the drawing.

A valuable feature of my invention resides in the fact that the switch is independent of the action of gravity in its operation and may be mounted in any desired position. Furthermore, the switch is not influenced by motion imparted to it by outside influences, such as the rolling of a ship or a carriage of any type.

I have illustrated my invention in a preferred form of simple and substantial design, although modifications therein will naturally occur to those skilled in the art.

I claim as my invention:—

1. A reversing switch comprising an armature, magnetic means comprising a pair of coils for actuating the armature in either of two directions, means for latching said armature in an intermediate position, said latching means being disposed between said coils and operative in directions corresponding to the armature movement, and means for restoring said armature to said position when said magnetic means is de-magnetized.

2. A reversing switch comprising an armature and magnetic means for actuating the armature in either of two directions, means for latching said armature in an intermediate position, said latching means comprising part of the active magnetic circuit and being operative in directions corresponding to the armature movement to be-

come energized upon the energization of said magnetic means, and means for restoring said armature to said position when said magnetic means is demagnetized.

3. A reversing switch comprising an armature and operating means for actuating the armature in either of two directions, means for latching said armature in an intermediate position, said latching means comprising part of the effective magnetic circuit of said operating means, means for imparting initial movement from one operative position of said armature to another and means comprising said operating means for completing said movement.

4. A reversing switch comprising an armature, a plurality of coils for effecting the operation of the armature oppositely, a plurality of latching members mounted on a single bearing for restraining said armature in an inoperative position, a single spring for biasing said latching members, and means comprising said coils for selectively overcoming said bias to release said armature for movement in a direction corresponding to the selective energization of said coils, and means for restoring said armature to its inoperative position.

5. A reversing switch comprising an armature having a pair of magnetizable arms extending in opposite directions, a pedestal-type bearing therefor, a pair of S-shaped latching members mounted on a common bearing and supported on said pedestal bearing, a single tension spring connected between said members, a flange extending from said armature and having detents for engaging said latching members and means for simultaneously energizing said armature and the one or the other of said latching members.

6. A reversible switch comprising an armature having a pair of magnetizable arms extending in opposite directions, a pedestal-type bearing therefor, a pair of latching members mounted on a common bearing and supported on said pedestal bearing, a single tension spring connected between said members, a flange extending from said armature and having detents for engaging said latching members and means for simultaneously energizing said armature and the one or the other of said latching members.

In testimony whereof, I have hereunto subscribed my name this 15th day of January, 1924.

CHARLES H. HODGKINS.