Aug. 14, 1951 W. G. BOURNE 2,564,246

ELECTROMAGNETIC REVERSING SWITCHES

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Fig.1

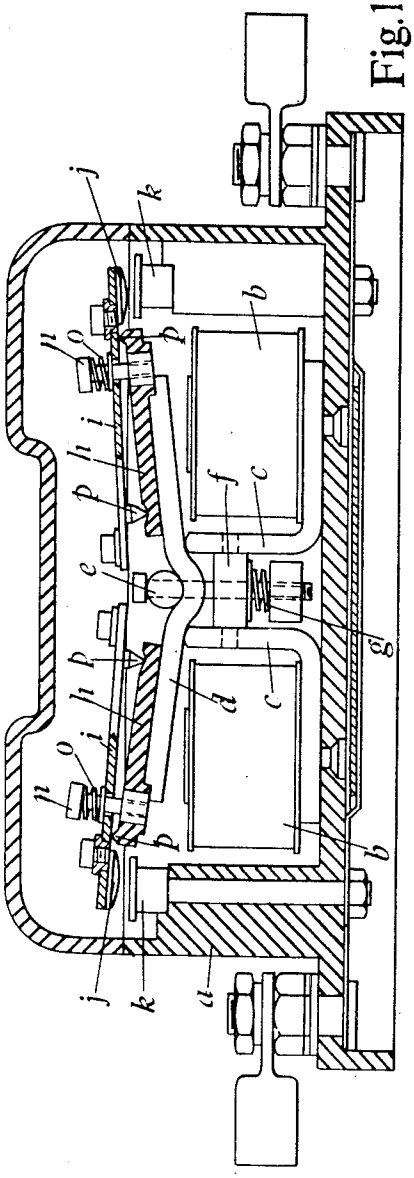
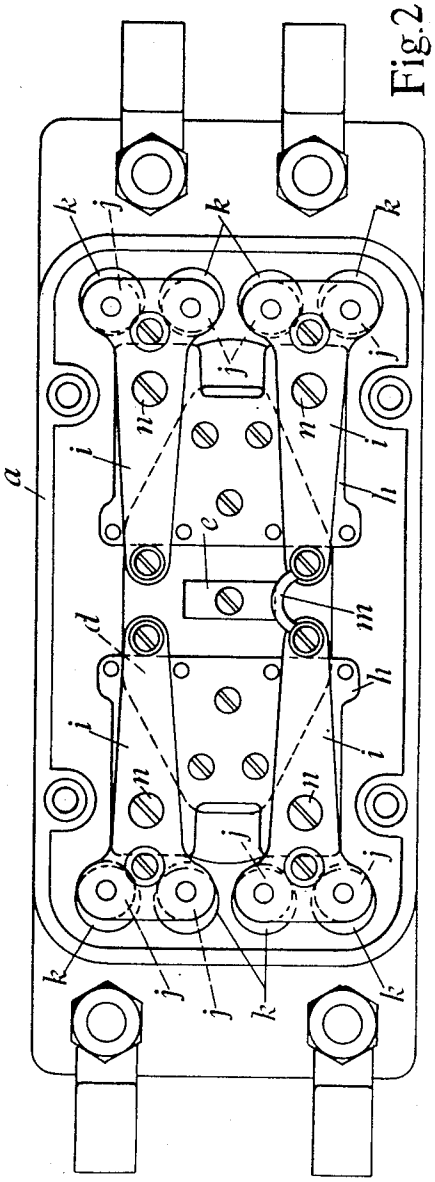


Fig.2



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ELECTROMAGNETIC REVERSING SWITCH

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1 Claim. (Cl. 200—98)

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This invention has for its object to provide an improved electromagnetic reversing switch adapted more particularly for controlling a reversible electric motor, but applicable to other analogous uses.

In the accompanying drawings:

Figures 1 and 2 are respectively sectional side view and plan of a switch embodying the invention.

Referring to the drawings, I mount on any convenient base *a* a pair of electromagnets *b*, these being arranged parallel with each other (or otherwise side by side) and at a convenient distance apart. Between the electromagnets are mounted a pair of fulcrum pieces *c*, these being also situated at a convenient distance apart. Each such piece consists of an iron plate bent to an L-shaped form, one part of which being arranged beneath and secured to the lower end of the core of the associated electromagnet and the other part being arranged to extend upwardly alongside the electromagnet. On the upper ends of the two fulcrum pieces is supported an iron rocker *d* which extends across the upper ends of the cores of the electromagnets. Transversely across its centre the rocker is shaped to the form of a shallow trough, which lies between the upper ends of the fulcrum pieces *c*, and in the trough is located a T-shaped retaining piece *e* the head of which lies in the trough and the stem of which extends through the rocker and a bridge piece *f* between the fulcrum pieces, a loading spring *g* carried on the stem serving to hold the rocker on the fulcrum pieces.

On each of the two arms of the rocker is secured an insulating piece *h* to which is attached a pair of contact members *i*. Each of the latter is of T-shape and its head is provided with a pair of contact pieces *j* (or a single contact piece) which can bridge a pair of fixed contact pieces *k* carried on the base. The tail of each contact member extends towards the centre of the rocker, and the adjacent ends of one pair of opposite contact members may be interconnected by a short flexible conducting link *m*. Each contact member is attached to its insulating piece by a screw *n* through the medium of a small spring *o* and moreover is supported on the said piece by a pair of pivot points *p*, so that the contact members can rock slightly about a longitudinal axis and thereby ensure uniform pressure on the associated pair of fixed contact pieces when the switch is closed.

It will be understood from the foregoing that on the base are provided four pairs of fixed contact pieces, and that each arm of the rocker

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carries two movable contact members, one of which can bridge one pair of fixed contact pieces and the other can bridge the other pair. The fixed contacts are suitably interconnected to enable the required reversal of current flow to be obtained, and when the switch is required for use with a reversible electric motor having shunt and series field windings, a terminal is provided on one of the interconnected movable contact members for connection to one end of the shunt winding.

The switch construction is such that when either of the electromagnets is excited it pulls down the adjacent end of the rocker, causing the latter to rock on one of the fulcrum pieces against the action of the spring of the retaining member, the rocket being in this action lifted off the other fulcrum piece. On release of the rocker by the electromagnet it returns under the action of the said spring to its original position where it is supported on both of the fulcrum pieces.

When the switch is used to control a reversible motor of the kind above mentioned, the motor armature is connected to one in each pair of fixed contact pieces at one end of the switch, and the power supply is connected to terminals at the other end of the switch, the series field winding being connected between one of these terminals and one of the adjacent fixed contact pieces, and the other terminal being connected to another of the fixed contact pieces at that end. Also the shunt field winding is connected between one end of the series field winding and one of the movable contact members, the various connections being such that on moving the rocker to one position or the other from its central or "off" position, the reversal of the direction of current occurs only in the motor armature.

A switch as above described serves not only as a reversing switch but also as a controlling switch, as it automatically interrupts the current supply when either of the previously operative electromagnets is put out of action, the latter being under the control of a manually operable switch or switches.

By this invention I am able to provide an electromagnetically operable reversing switch in a very convenient form, and although the switch is primarily intended for controlling a reversible electric motor, it may be applied to other analogous uses.

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

An electromagnetic reversing switch, compris-

ing the combination of a pair of electromagnets arranged side by side, a rocker operable by the electromagnets, a pair of spaced fulcrum pieces situated between the electromagnets and supporting the rocker at opposite sides of its centre, the central part of the rocker being shaped to form a shallow transverse trough which lies between adjacent ends of the fulcrum pieces, spring loaded retaining means arranged centrally between the fulcrum pieces and having a part located in the trough to hold the rocker on the fulcrum pieces, movable contacts carried by the rocker, and fixed contacts with which the movable contacts co-operate under the action of the rocker.

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