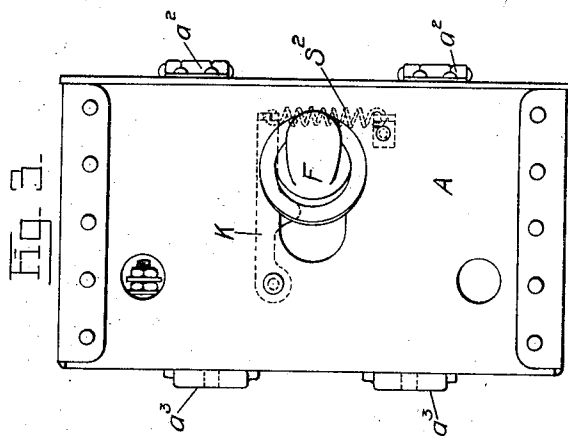
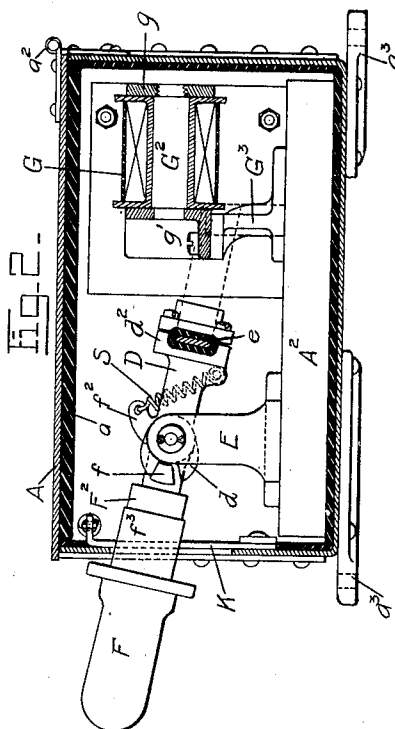
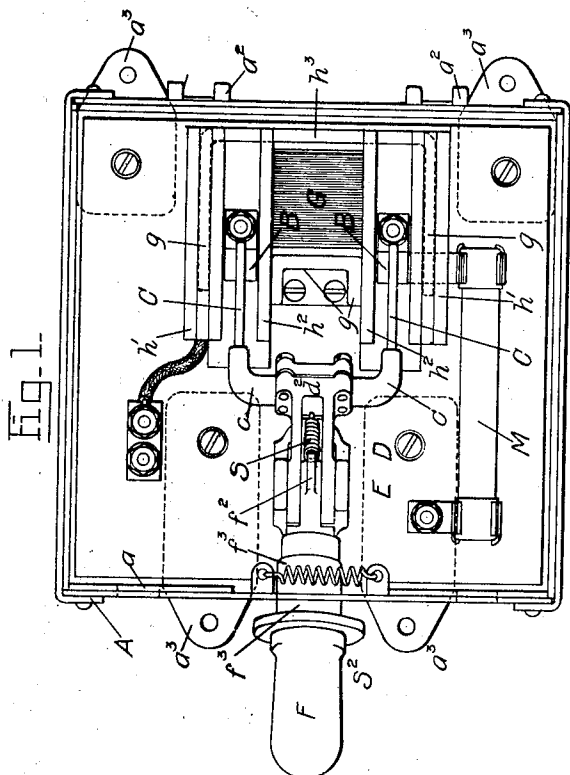


J. F. McELROY.
ELECTRIC SWITCH.
APPLICATION FILED NOV. 17, 1910.

1,002,595.

Patented Sept. 5, 1911.

2 SHEETS—SHEET 1.



WITNESSES:

L. T. Shaw
C. B. Titus.

INVENTOR

James F. McElroy

BY

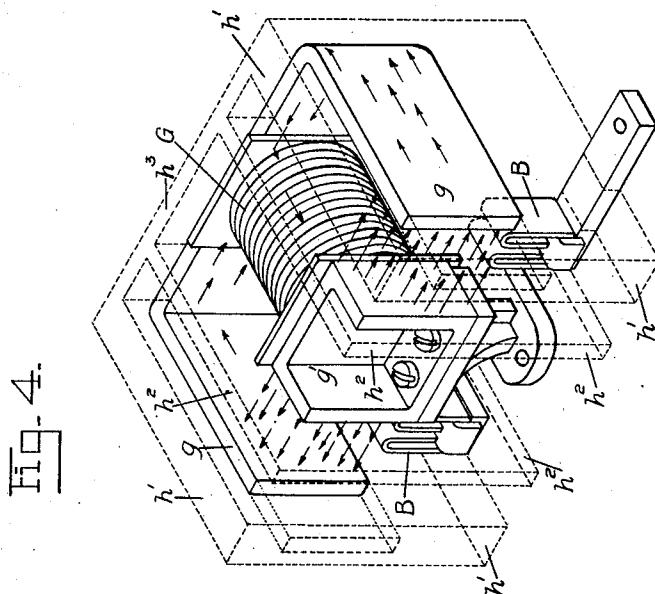
E. M. Bentley

ATTY

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2 SHEETS—SHEET 2.



L. T. Shaw
C. B. Titus.

James F. M. Elroy

E. M. Brantley

ATTY

UNITED STATES PATENT OFFICE.

JAMES F. McELROY, OF ALBANY, NEW YORK, ASSIGNOR TO CONSOLIDATED CAR HEATING COMPANY, A CORPORATION OF WEST VIRGINIA.

ELECTRIC SWITCH.

1,002,595.

Specification of Letters Patent.

Patented Sept. 5, 1911.

Application filed November 17, 1910. Serial No. 592,801.

To all whom it may concern:

Be it known that I, JAMES F. McELROY, a citizen of the United States, residing at Albany, county of Albany, State of New York, have invented certain new and useful Improvements in Electric Switches, the following being a full, clear, and exact disclosure of the one form of my invention which I at present deem preferable.

For a detailed description of the present form of my invention, reference may be had to the following specification and the accompanying drawings forming a part thereof, in which—

Figure 1 is a plan view of my switch with the top of the inclosing case removed; Fig. 2 is a vertical section of Fig. 1; Fig. 3 is an end view, and Fig. 4 is a perspective of the blow-out magnet with the insulation shown in dotted lines.

My invention relates to a switch particularly adapted for electric railway circuits of 1200 to 1500 volts to control apparatus employed on the cars.

In Figs. 1, 2 and 3 A represents an inclosing box of metal with insulating lining *a*. The top of this box is hinged at *a*² and is provided with feet *a*³ by which it may be attached to any desired support. On the inside bottom of the box is a base A² of insulation on which is mounted the standard E, to the upper end of which are separately pivoted the handle F and the blade-carrier D. The handle F has a certain amount of lost motion with respect to the carrier D, a lug *f* on the handle being adapted to engage a corresponding lug *d* on the carrier D and operate the carrier after the handle has moved a certain distance. The handle also carries a lug *f*² to which is anchored one end of a spring S, the other end being anchored to the carrier D. The handle F is of fiber or similar insulating material and is mounted upon a metal shaft F² by means of a metal ring *f*³ through which and the carrier D a fiber pin is passed. The outer end of D carries a clamp *d*² in which is secured a U-shaped plate of metal the two ends of which form the switch-blades C C which constitute the movable contacts of the switch. The central part of the U, where it is gripped by the clamp *d*², is surrounded by insulation *e*. The blades C C are adapted to engage respectively with two stationary contacts B B

having spring jaws as is particularly shown in Fig. 4.

A blow-out magnet is provided in the right end portion of the box, consisting of a coil G surrounding a core G² (see Fig. 2). The axis of the core and coil are parallel to the blades C C and on the forward end of the core G² is a cast iron pole piece *g*¹ shaped with bottom and side flanges as particularly appears in Fig. 4. At the rear end of core G² is a U-shaped bar *g* of soft iron, the center of the U being secured to the core G² and the two ends thereof extending back parallel to the core to points outside of the contacts B B respectively. The pole pieces *g g* are embedded in insulation *h*¹ formed, as appears in Fig. 1, of insulating sheets secured to the inside and outside of the respective pole pieces with an intervening piece covering the extremities of the poles. Similar sheets of insulation *h*² are applied on either side of the pole piece *g*¹. Thus the central pole piece *g*¹, together with the core G² and coil G, are located between the two blades, or movable contacts, C C, the pole pieces *g g* coming outside of the said blades respectively. By this means each set of contacts is placed in a recess or inclosure formed by the insulation *h*¹ and the pole piece *g* on the outside and the insulation *h*² and pole piece *g*¹ on the inside. The magnetic lines of force will therefore pass from the central pole piece *g*¹ across the arc gap between stationary and movable contacts on either side, as indicated by the arrows in Fig. 4, to the opposite pole pieces *g g*. A fuse M is interposed in the circuit between the magnet winding G and one binding post. The lead wires of the magnet pass under the pole pieces *g g* between the insulating plates by which the pole pieces are surrounded and from thence pass into the winding G. The insulating plates *h*¹ *h*² are connected at the rear by an insulating plate *h*³ (see Fig. 4). By this means the iron of the magnet is completely insulated, the magnet itself being supported on the standard G³ to which the pole piece *g*¹ is screwed (see Fig. 2). This standard rests upon the insulating base A².

The handle F extends outside of box A and plays in a slot in the box (see Figs. 2 and 3).

A cam lever K is pivoted just inside the slot and a spring S² attached to its upper

end tends to draw the lever toward the handle F. The cam on the lever bears against the metal sleeve f^3 aforesaid and serves to maintain the handle F in either one of its two positions. Thus in Fig. 3 the handle is in its upper position and the cam comes beneath it. A downward movement of the handle will force the cam aside against the tension of the spring S^2 until the handle has passed, when the cam will be drawn back by the spring on the upper instead of the under side of the ring f^3 .

The above described arrangement makes an extremely simple, compact and effective switch with adequate extinguishing capacity in the blow-out magnet and thorough insulation. Not only is the magnet itself insulated as above described, but the blades C C are doubly insulated, first at the clamp d^3 and secondly by the handle F.

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

1. An electric switch, comprising a pair of stationary contacts, a pair of movable contacts, means for simultaneously operating the movable contacts, an electromagnet having one pole between the two sets of contacts and opposite poles outside of both sets, and interposed insulation on the pole faces forming a separate inclosure for each set.
2. An electric switch, comprising two stationary contacts, two movable contacts, means for operating the movable contacts, a magnet having its energizing coil and one pole between the two sets of contacts and two opposite poles outside of both sets, together with interposed insulation on the pole faces forming a separate inclosure for each set.
3. An electric switch, comprising two stationary contacts, two movable contacts, means for operating the movable contacts, a magnet having its core and coil thereon parallel to the plane in which the movable contacts move, a pole piece at the front end of said core between the two contacts, and two opposite pole pieces extending from the rear of said core to points outside of the said stationary contacts respectively.
4. An electric switch, comprising two sta-

tionary contacts, two movable contacts, means for operating the movable contacts, a magnet having its core and coil thereon parallel to the plane in which the movable contacts move, a pole piece at the front end of said core between the two contacts, and two opposite pole pieces formed by a U-shaped bar of iron embedded in insulation and extending from the rear of said core to points outside of the said stationary contacts respectively.

5. An electric switch, comprising two stationary and two movable contacts, means for operating the movable contacts, a magnet having one pole between the two sets of contacts and opposite poles extending outside of the respective sets of stationary contacts to inclose the latter, an inclosing metallic box, and insulating material between the iron of the magnet and the box and between the pole pieces aforesaid and the respective sets of contacts.

6. An electric switch, comprising two stationary contacts, two movable contacts, a magnet having insulated poles projecting outside of the two sets of contacts respectively and forming recesses therefor, a carrier for the movable contacts, insulation between said carrier and said movable contacts, and an operating handle for the carrier.

7. An electric switch, comprising two stationary contacts, two movable contacts, an electromagnet having pole pieces projecting on opposite sides of each set of contacts respectively to inclose the latter, insulation inclosing the said pole piece and the lead wires of the magnet, a metallic box with insulation between it and the iron portions of said magnet, a carrier and handle for operating the said movable contacts, and a cam for holding the switch in its open or closed position.

In witness whereof I have hereunto set my hand, before two subscribing witnesses, this 15th day of November, 1910.

JAMES F. McELROY.

Witnesses:

ERNEST D. JANSEN,
ROBERT MCCOCHRANE.