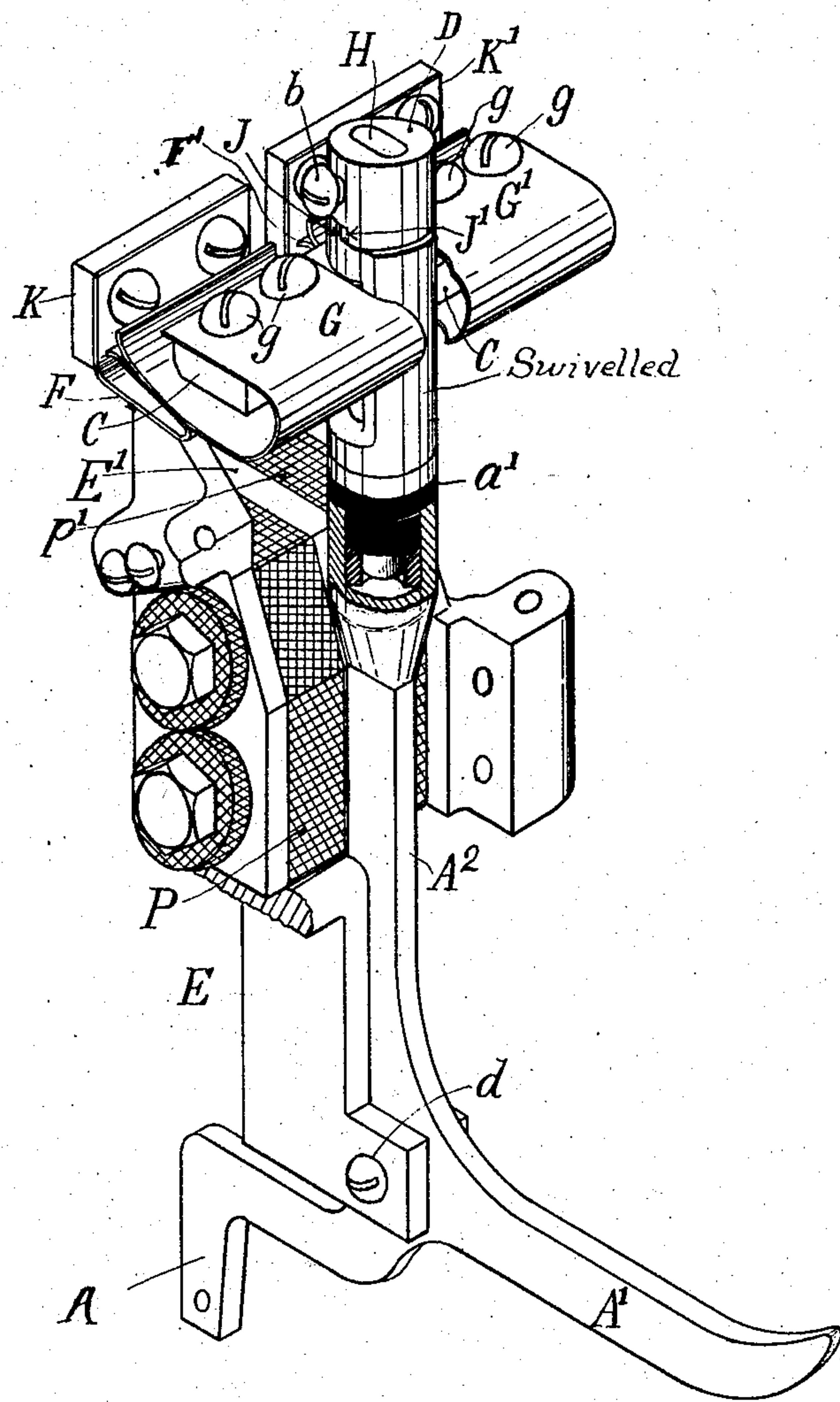


No. 816,028.

PATENTED MAR. 27, 1906.

J. F. McELROY.
ELECTRICAL SWITCH.
APPLICATION FILED APR. 30, 1903.



Witnesses
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UNITED STATES PATENT OFFICE.

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ELECTRICAL SWITCH.

No. 816,028.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed April 30, 1903. Serial No. 154,924.

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, and State of New York, have invented certain new and useful Improvements in Electrical Switches, of which the following specification and the accompanying drawing set forth the principles thereof and also as an illustration that form of my invention which I now consider the best out of the various forms in which its principles may be embodied.

In the drawing I have shown a perspective view of my invention.

In my electric-lighting apparatus for railway-vehicles I employ a dynamo driven by an axle of the vehicle, and since the vehicle must run at a changeable speed it is necessary to provide an automatic switch that will act at a given minimum speed to connect the dynamo to or disconnect it from the operating-circuit on the vehicle. It is a special feature of my system that such cut-out switch is controlled by the regulating mechanism used for governing the dynamo to maintain its action constant, so far as speed changes are concerned, but variable so far as load changes are concerned, the load being dependent upon the lamps and storage battery which it may be operating at any given time.

It is not necessary in the present case to describe the details of the regulator mechanism which in my system causes the switch to operate at the right moment—viz., when the increasing or decreasing speed gives the dynamo a tendency to rise above or fall below the prescribed potential. The invention relates to a peculiar construction of the contacting parts of the switch with reference to the duty the switch is to perform. In other systems the corresponding switch is operated by a special magnet and forms an independent device separate from the regulator. My present invention concerns this switch however operated.

Referring to the drawing, A represents the switch-lever, which is of the angle or elbow type, pivoted in the framework E of the apparatus at the point d. The pivot is at the angle of the lever which is provided with a horizontal arm A'. The switch-contacts are carried by the opposite or vertical arm A² of

the angle-lever and comprise two springs G and G', which are in electrical connection with each other and serve to close the circuit by engaging with two insulated contact-springs F and F', that form the respective stationary terminals of the circuit to be closed.

The leading feature of my present invention lies in mounting the two springs G and G' on a swivel, which in the example shown has an axis parallel with the vertical arm A² of the switch-lever. The swivel has but a limited play, which is, however, sufficient to equalize the pressure of the two movable springs G and G' against the respective stationary springs F and F'. On the upper end of lever-arm A² is a projecting stud H, that is carried by but insulated from the arm by an insulating-washer a' and an insulating-thimble that surrounds the lower end of the stud where it sets into the socket formed on the end of the arm A² for its reception. At the upper end of stud H and swiveling thereon is the equalizing cross-bar C, to which the springs G and G' are attached by screws g. The swiveling is effected by a neck on the upper end of the stud H, which passes through the equalizing cross-bar. To hold the cross-bar in place and to limit its swiveling play, a ring D is placed on the neck of the stud H above the cross-bar and held by a screw b, the ring being provided on its under side with a shoulder J', which engages a similar shoulder J on the upper side of the cross-bar when the limit of the play is reached. The stationary contact-springs F and F' are attached, respectively, to the upper ends of the vertical plates K and K', which in turn are secured to insulating-blocks P P', fastened to the opposite sides of a vertical rib E' of the framework E. By this means the two movable contact-springs G and G' are mounted on the swiveling equalizing cross-bar C, which is pivoted at a point between the two springs to the end of lever-arm A² on an axis which is vertical, and hence transverse to the horizontal line of movement of the lever-arm A², which operates it. The result is that there is necessarily an equally firm pressure and an equally good contact between springs G and F on the one side and springs G' and F' on the other. This result is also attained without any nice adjustment of either set of con-

tacts. In closing the circuit one set may engage first, and then the movable spring of the other set will rock or swivel slightly on the pivot and be turned into engagement with its mate subsequently and with pressure equal to that of the first set. The arrangement avoids the mechanical difficulty in making one rigid set of springs fit another rigid set with no yielding element except the springs themselves, which cannot well be sufficiently flexible and also sufficiently substantial and yet be operated with certainty by a small power. It is also to be remembered that the reliability of the apparatus depends wholly on the cut-out switch that may by sticking or by imperfect contact disable and perhaps seriously injure the apparatus.

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

1. An electric switch comprising a swiveled bar having a pair of spring-contacts the faces of which are adapted to yield in a direction substantially transverse to the plane of oscillation of said bar, a coacting pair of contacts, and means for moving one set of contacts toward and from the other.

2. An electric switch comprising a movable member, a bar swiveled to said member and having spring-contacts on opposite sides of its axis of movement, the axis of said swiveled bar being on a plane transverse to the plane of movement of said movable member, and a coacting pair of spring-contacts, the faces of said contacts being adapted to yield in a direction substantially transverse to the plane of movement of said swiveled bar.

3. An electric switch comprising two pairs of spring-contacts having their contacting faces adapted to slide when making and breaking the circuit, a swiveled bar carrying one pair of said contacts, and means for moving said contacts relatively to each other in a

direction substantially in the plane of said sliding faces.

4. An electric switch having two pairs of contacts, the contacts of one pair being insulated from each other and the two contacts of the other pair being electrically connected, a swiveled bar carrying one pair of said contacts and movable toward and from the other pair of contacts in a direction substantially the same as the plane of oscillation of said swiveled bar, and means for moving said swiveled bar in the direction described.

5. In an automatic switch for a train-lighting system, the combination with stationary and movable sets of contacts, of an operating device therefor, said device comprising a pivoted member having its free end movable toward and from the stationary set of contacts, a bar carrying the other set of contacts and pivotally connected with the end of said pivoted member, the axis of movement of said bar being coincident with the longitudinal center of said pivoted member.

6. A movable switch-arm having an equalizing-bar pivoted thereto on an axis substantially transverse to the direction of movement of said arm, a set of spring-contacts on said equalizing-bar, and a second set of contacts cooperating with those on the said equalizing-bar, the said contacts having yielding faces in a plane crossing the plane of movement of the switch-arm and equalizing-bar, whereby said contacts will slide relatively to each other when making and breaking the circuit.

In witness whereof I have hereunto set my hand, before two subscribing witnesses, this 28th day of April, 1903.

JAMES F. McELROY.

Witnesses:

BEULAH CARLE,
ERNEST D. JANSEN.