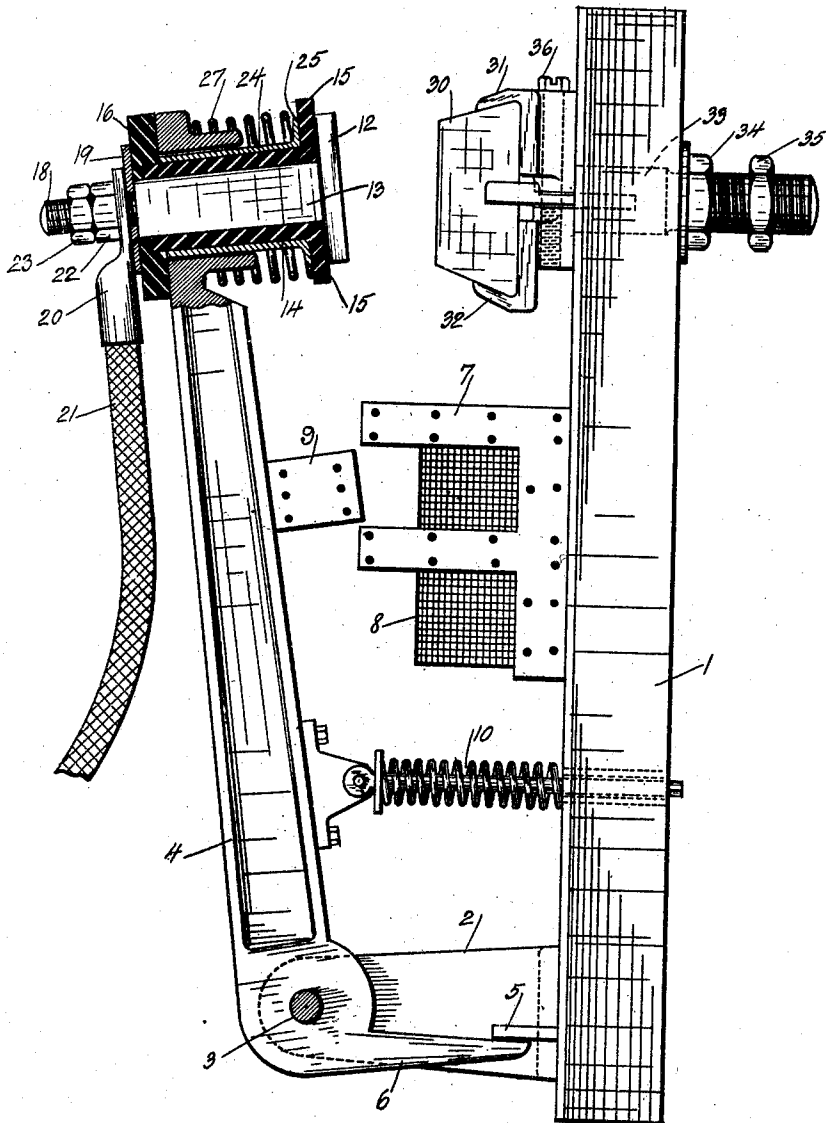


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ELECTRIC SWITCH CONTACT HOLDER.
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1,016,837.

Patented Feb. 6, 1912.



Witnesses
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UNITED STATES PATENT OFFICE.

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NEW JERSEY.

ELECTRIC-SWITCH-CONTACT HOLDER.

1,016,837.

Specification of Letters Patent.

Patented Feb. 6, 1912.

Application filed May 7, 1908. Serial No. 431,523.

To all whom it may concern:

Be it known that we, DAVID L. LINDQUIST and DAVID LARSON, subjects of the King of Sweden, residing at Yonkers, in the county of Westchester and State of New York, have invented a new and useful Improvement in Electric-Switch-Contact Holders, of which the following is a specification.

Our invention relates to an electric switch contact holder in which a bushing or sleeve of insulating material is used to separate the switch contact from the switch arm or support which carries the contact, and one of the objects of the invention is to provide a construction in which the parts are securely held in position in such a manner that the operation will be unaffected by the unequal expansion and contraction of the insulating material and metal.

The accompanying drawing is a side elevation view, partly in section, of an electromagnetic switch showing the application of our invention.

As here shown, to a base or support 1 of slate or other insulating material is secured a bracket 2, to which is pivoted at 3 the switch arm 4. The outward movement of the arm 4 is limited by a stop 5 in the path of movement of an extension 6 of the switch arm. An electro-magnet comprising a laminated frame 7 and a winding 8 is secured to the base 1, and its armature 9 is secured to the switch arm 4. The magnet when energized operates to close the switch, and a coil spring 10 opens the switch when the magnet is deenergized.

The switch arm 4 carries a movable contact 12 in the form of a flat plate or disk having a stem 13, preferably rectangular or non-circular in cross-section, extending through the switch arm. The movable contact is insulated from the switch arm by a bushing of insulating material comprising a sleeve 14 closely fitting the stem 13 and formed with an integral flange 15 which bears against the contact 12. An insulating washer or plate 16 which is preferably made somewhat thicker than the flange 15, fits snugly on the stem 13 and is recessed to receive the end of the sleeve 14. The stem 13 is provided with an integral extension in the form of a screw-threaded rod 18. A metal disk or plate 19 is mounted on this rod and bears against the shoulder formed

at the end of the stem 13. The rod 18 forms a binding post for the terminal 20 of a conductor 21 leading to the switch, said terminal bearing against the plate 19 and being clamped in position by the nuts 22 and 23. A metal sleeve 24 is mounted on the insulating sleeve 14 and is provided at its front end with a flange 25 bearing against the flange 15, the rear end of the metal sleeve abutting against the washer 16. The sleeve 24 extends loosely through an opening in the switch arm and is yieldingly held in its forward position by a coil spring 27.

As the switch arm is moved forward toward its closed position, the contact 12 engages the stationary contact 30 before the switch arm has reached its forward limit of movement, and the continued movement of the switch arm compresses the spring 27 and holds the switch contacts together with a yielding pressure. The spring 27 serves to hold the flat surfaces of the contacts squarely in engagement, as there is sufficient clearance between the sleeve 24 and the switch arm to permit angular movement of the contact 12 in any direction which may be necessary to make the contact surfaces parallel. The insulation 14, 15 prevents the spring 27 from becoming overheated, and the sleeve 24 takes up wear.

With the construction herein shown, the plate 19 prevents any material displacement of the insulating material, even when the parts are subjected to considerable variations in temperature and the consequent unequal expansion and contraction of the insulating and metal parts.

Any suitable form of stationary contact and holder may be used. As herein shown, a carbon contact 30 is held between a pair of clamping jaws 31 and 32 formed integral with a stem 33 extending through the base 1. The threaded end of the stem 33 is provided with nuts 34 and 35 to secure the clamping jaws to the base 1 and to attach an electric conductor. A bolt 36 passing loosely through the body portion of the jaw 31 and threaded into the body portion of the jaw 32 serves to clamp the jaws to the carbon contact.

We wish not to be limited to the exact construction disclosed, as various changes in details of construction and arrangement of

parts might be made by those skilled in the art without departing from the spirit and scope of the invention.

The invention is applicable to various forms of switches, whether manually or automatically operated, although the means for yieldingly connecting the contact to the switch arm is especially adapted for absorbing the vibrations and securing a good electrical connection of the contacts where an alternating current electro-magnet is used to operate the switch.

What we claim as new and desire to secure by Letters Patent of the United States is:—

1. In an electric switch, the combination with a support having an opening extending therethrough, of an electric contact having a stem extending through said opening, a sleeve or bushing mounted on said stem and extending loosely through said opening and provided with a flange in position to form a stop to limit the movement of said stem, and a plate mounted on the stem and securing said sleeve or bushing against displacement.

2. In an electric switch, the combination with a contact plate, of a stem extending therefrom, a reduced extension formed on the stem, a plate mounted on said extension, means for securing said plate against the end of the stem, an insulating flanged sleeve or bushing mounted on the stem, and a support having an opening in which the stem and the insulating sleeve are loosely mounted.

3. In an electric switch, the combination with a switch arm having an opening therethrough, of a switch contact plate, a stem formed thereon and extending through said opening, an extension of reduced diameter on said stem, a plate mounted on said extension, a clamping nut securing said plate against the shouldered end of the stem, a sleeve of insulating material mounted on the stem and having a flange at one end bearing against said contact plate, a disk or washer of insulating material forming a flange for the opposite end of the sleeve and located between the switch arm and said plate, and a coil spring surrounding said sleeve and located between the switch arm and contact plate.

4. In an electric switch, the combination with a contact plate, of a stem formed thereon, a sleeve of insulating material mounted on the stem and having an integral flange at one end bearing against the contact plate, a plate of insulating material mounted on the stem and forming a flange for the other end

of said sleeve, a metal sleeve mounted on the insulating sleeve and forming a stop for said plate of insulating material, and a plate secured to the stem and securing the insulating material against displacement.

5. In an electric switch, the combination with a support, of a contact, connections between the support and contact permitting universal movement of the contact, and insulating material carried by the contact and insulating it from its support.

6. The combination with a supporting member having an opening extending therethrough, of a contact member extending through the opening, an insulating bushing on the contact member, and a metal sleeve on the bushing and extending loosely through said opening.

7. The combination with a supporting member having an opening therethrough, of a switch contact movable in said opening, insulating material carried by said contact and insulating it from the supporting member, and means for yieldingly holding the contact at its limit of movement relative to the supporting member.

8. In a switch, the combination with a support having an opening therethrough, of a contact formed with a stem extending through said opening, a bushing of insulating material on said stem, and a coil spring interposed between said support and the end of the bushing.

9. In a switch, the combination with a switch arm having an opening therethrough, of a contact having a stem extending through said opening, a flanged sleeve of insulating material secured to the stem, and a coil spring surrounding the sleeve and located between the switch arm and the flange on the sleeve.

10. In a switch, the combination with a switch arm having an opening therethrough, of a contact having a stem extending through the opening, a flanged sleeve of insulating material surrounding said stem, a flanged metal sleeve mounted on the insulation and extending loosely through said opening, and a coil spring surrounding said sleeves and yieldingly holding the contact in position.

In testimony whereof, we have signed our names to this specification in the presence of two subscribing witnesses.

DAVID L. LINDQUIST.
DAVID LARSON.

Witnesses:

CHAS. M. NISSEN,
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