June 2, 1931. E. ISHIMARU 1,808,555

ELECTRIC SWITCH

Filed Aug. 8, 1927 2 Sheets-Sheet 1

Fig. 1.

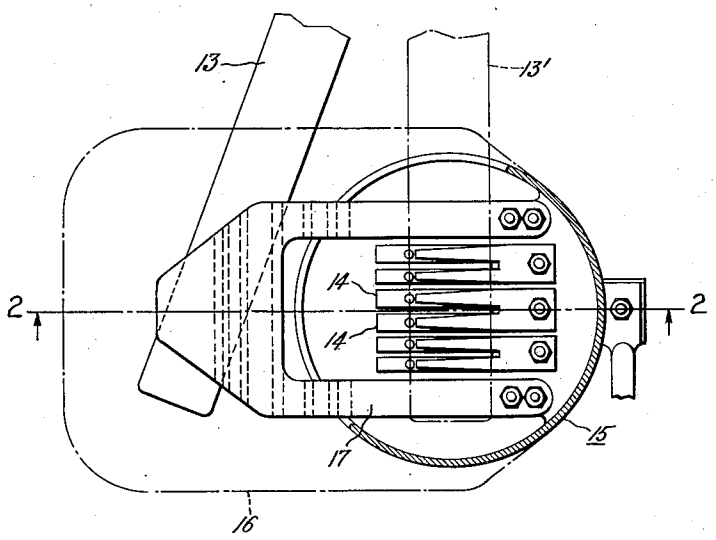
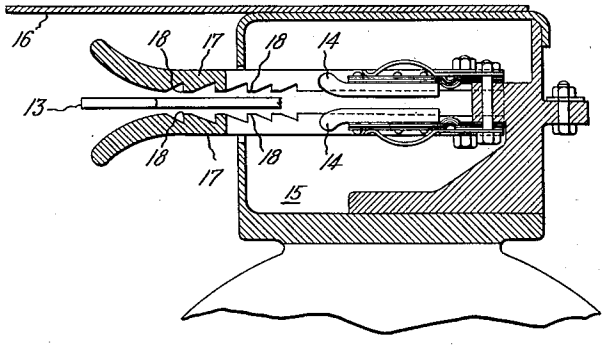


Fig. 2.



Inventor:
Eikichi Ishimaru,
by Alexander D. Lane
His Attorney.

June 2, 1931. E. ISHIMARU 1,808,555

ELECTRIC SWITCH

Filed Aug. 8, 1927 2 Sheets-Sheet 2

Fig.3.

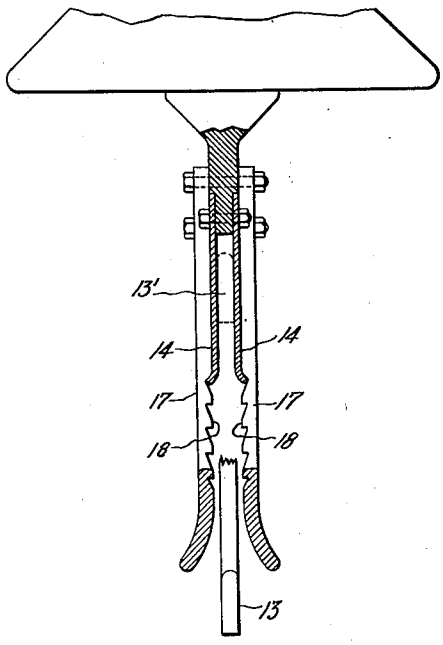


Fig.4.

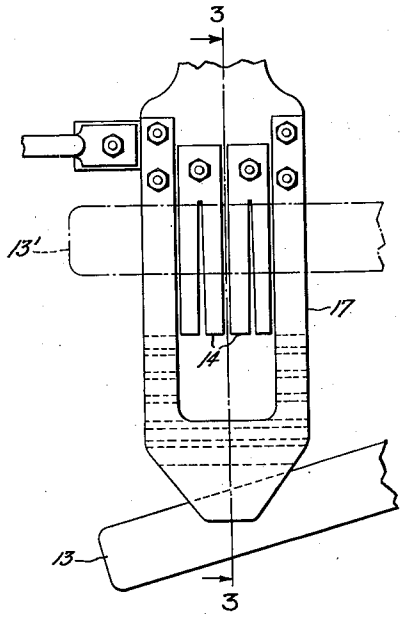


Fig.5.

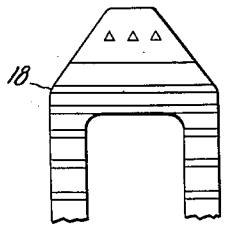


Fig.6.



Fig.7.

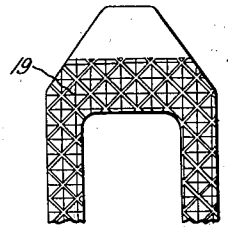


Fig.8.

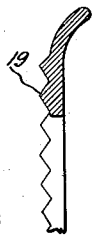


Fig.9.

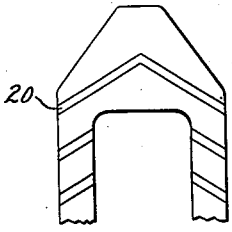


Fig.10.

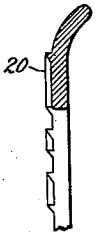


Fig.11.

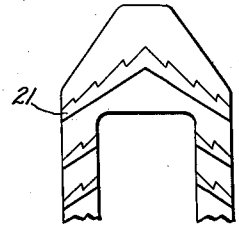


Fig.12.



Inventor:
Eikichi Ishimaru,
by Alexander S. Lamb
His Attorney.

Patented June 2, 1931 1,808,555

UNITED STATES PATENT OFFICE

EIKICHI ISHIMARU, OF TOKYOFU, JAPAN, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK

ELECTRIC SWITCH

Application filed August 8, 1927, Serial No. 211,399, and in Japan October 26, 1926.

My invention relates to improvements in electric switches and more particularly to outdoor disconnecting switches and has for an object to provide an improved arrangement for removing ice, snow, sleet, and the like which may have accumulated on the movable contact while in the switch open position so as to prevent damage to the fixed contact and also to insure a better contact on movement of the movable contact to the switch closing position. Another object of my invention is to combine with the ice removing arrangement means for guiding the free end of the movable contact into alinement with the fixed contact.

My invention will be better understood from the following description when considered in connection with the accompanying drawings and its scope will be pointed out in the appended claims.

In the accompanying drawings, Fig. 1 is a plan view of the stationary contact end of a disconnecting switch embodying my invention, the switch blade being arranged for movement in a horizontal plane, Fig. 2 is a section on the line 2—2 of Fig. 1, Fig. 3 is a section on the line 3—3 of Fig. 4 which is a side elevation of the stationary contact end of a disconnecting switch embodying my invention, the switch blade being arranged for movement in a vertical plane. Figs. 5, 7, 9 and 11 are elevations showing various modifications of ice removing members according to my invention, and Figs. 6, 8, 10 and 12 are mid-sections of the members shown in Figs. 5, 7, 9 and 11 respectively.

In the embodiment of my invention shown in Figs. 1 and 2, the free end of a movable contact such as a disconnecting switch blade 13 arranged for horizontal movement cooperates with a stationary contact shown as comprising jaws 14, the other or hinged end of the blade being omitted as unnecessary to an understanding of my present invention. The contact jaws 14 are suitably secured to an insulator cap and terminal structure 15 which may be arranged to inclose or house the contact as shown and which may further include a protecting shield such as a plate 16 shown only in outline in Fig. 1 by dot and dash lines.

In accordance with my invention, I provide means for removing ice and the like from the movable contact or blade 13 on movement thereof to the switch closed position indicated by 13′. This means as shown in Figs. 1 and 2 comprises spaced members 17 having opposed faces provided with projections 18 between which the blade is movable before engaging the fixed contact. If desired the members 17 may form an integral part of the contact jaws 14 proper, or as shown the members 17 may be entirely separate from the jaw contact, but suitably secured to the fixed contact mounting in such a manner as to be in substantial alinement with the contact jaws 14 as shown. The members 17 are so spaced that the clearance between the opposing projections is sufficient to allow a free and unimpeded motion of the blade 13 when there is no ice, sleet and the like adhering thereto. When however the latter condition obtains, the ice deposit will be scraped, sheared, and/or crushed from the blade 13 on its movement between the projections 18. In order to guide the blade 13 into proper alinement with the contact jaws 14, I prefer to combine with the ice removing action of the members 17 a blade guiding action. This may be accomplished by having the outer ends of the members 17 suitably divergent as shown.

In the embodiment of my invention shown in Figs. 3 and 4, the members 17 are applied to the contact jaws 14 of a switch whose blade 13 is arranged for movement in a vertical plane. Otherwise the arrangement does not differ materially from that shown in Figs. 1 and 2.

While there is no particular limitation to the form of the projections 18, they should be such as properly to insure the removal of ice and the like upon movement of the blade 13 between the members 17. Moreover as the opening between the members 17 decreases as the blade 13 approaches the contact jaws 14, the pressure on ice and the like adhering to the blade increases. The projections 18 may therefore take a great number of forms,

illustrations of which are shown in Figs. 6 to 12 inclusive. Figs. 5 and 6 illustrate straight serrated projections running transversely of the members 17. Figs. 7 and 8 illustrate serrated projections in the form of pyramids 19 having square bases. Figs. 9 and 10 illustrate inverted V-shaped serrated projections 20 running transversely of the members 17 and Figs. 11 and 12 illustrate similar projections 21 having the outer edge serrated. In any case the component of force parallel to the side of the blade effects the removal of the adhering frozen substance since the inner edge of the blade 13 is then subject to material pressure as are also the sides when the blade is forced between the members 17 which also serve properly to aline the blade.

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

1. A switch comprising a movable contact, a cooperating fixed contact, and means for removing ice and the like from said movable contact on movement thereof to the switch closed position comprising spaced members having opposed faces provided with projections between which the movable contact is movable before engaging the fixed contact, the outer ends of said members diverging to form a guide for said movable contact.

2. A switch comprising a movable blade, a jaw contact therefor, and means associated with said contact for removing ice and the like from said blade on movement thereof to the switch closed position comprising spaced members having their opposed faces provided with serrated projections between which the blade is movable before engaging the contact.

3. A switch comprising a movable blade, a jaw contact therefor, and means associated with said contact for removing ice and the like from said blade on movement thereof to the switch closed position comprising spaced members respectively alined with the jaws of said contact and having their opposed faces provided with serrated projections between which the portion of the blade arranged to engage the jaw contact is movable before engagement therewith.

4. A combined blade guide and ice remover for outdoor switches having a movable blade and a jaw contact therefor comprising members adapted to be mounted in alinement with the jaws of said contact, said members having their opposed faces provided with serrated projections and their free ends divergent.

5. A switch comprising a movable blade, a jaw contact therefor, a housing for said contact, means associated with said contact for removing ice and the like from said blade on movement thereof to the switch closed position including spaced members projecting from said housing and having their opposed faces provided with projections between which the blade is movable before entering the housing and engaging the contact.

In witness whereof, I have hereunto set my hand this fifteenth day of July, 1927.

EIKICHI ISHIMARU.