H. W. YOUNG.

SWITCH.

APPLICATION FILED DEC. 11, 1913.

1,209,792.

Patented Dec. 26, 1916.

2 SHEETS—SHEET 1.

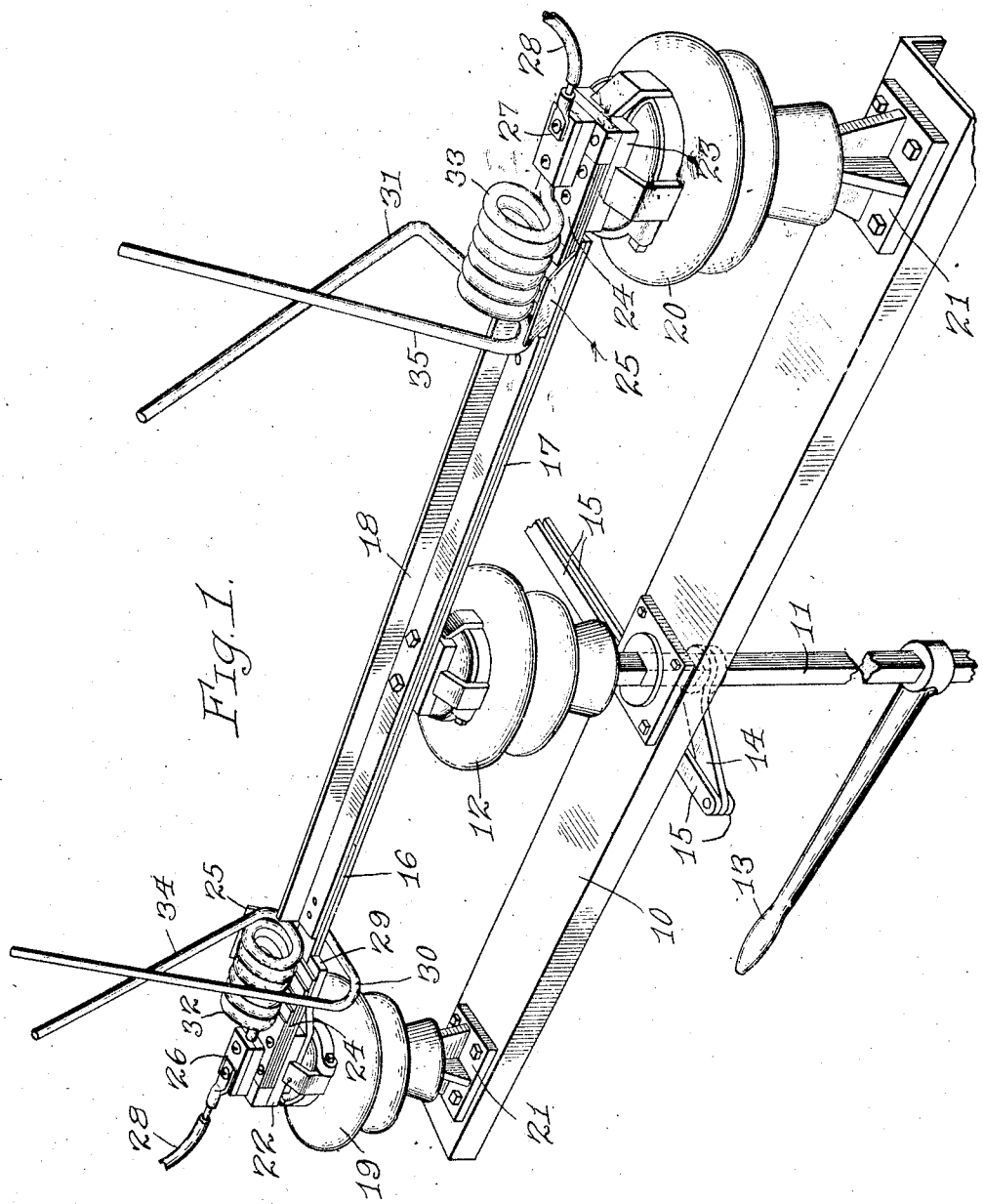


Fig. 1.

Witnesses:
L. B. Graham
M. H. DeBuck

Inventor:
Herbert W. Young
By Adams & Jackson
Att'ys.

H. W. YOUNG.

SWITCH.

APPLICATION FILED DEC. 11, 1913.

1,209,792.

Patented Dec. 26, 1916.

2 SHEETS—SHEET 2.

Fig. 2.

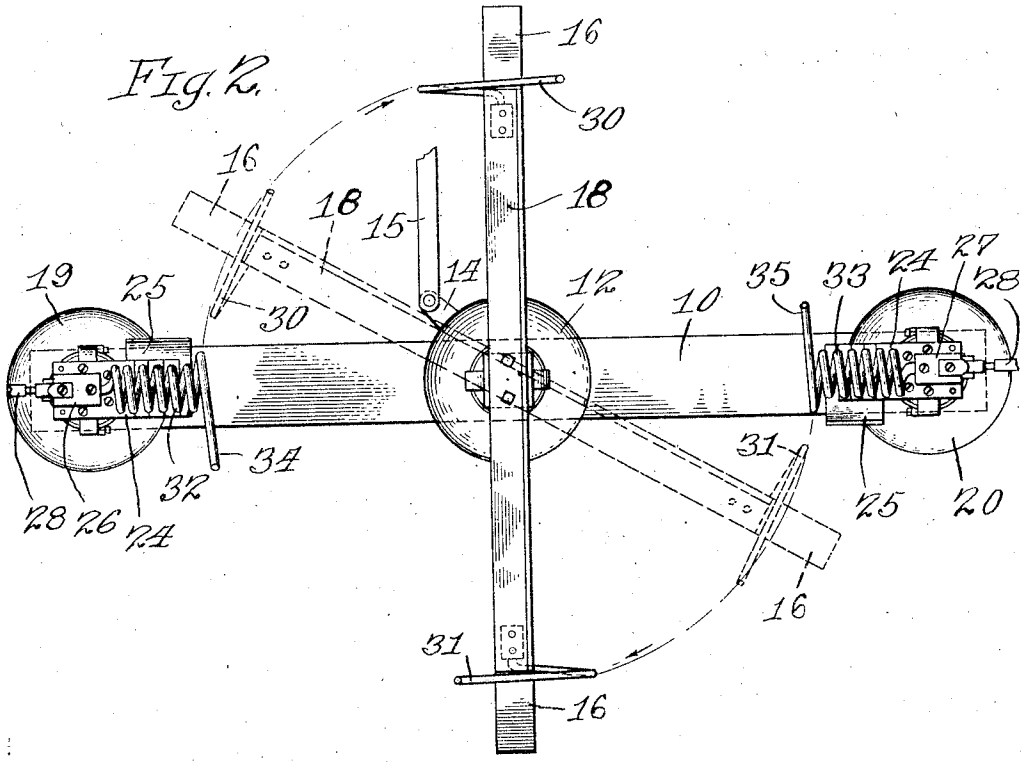
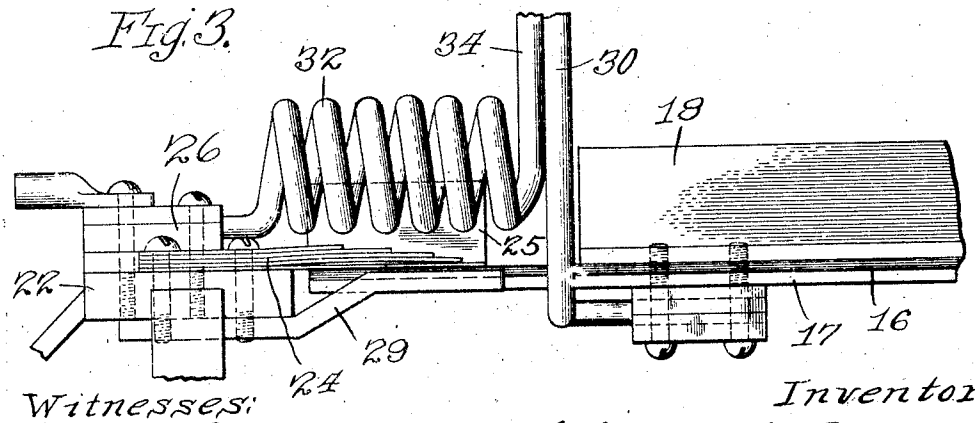


Fig. 3.



Witnesses:

L. B. Graham

M. L. DeBurk

Inventor:

Herbert W. Young.

By Adams & Jackson.

Attys.

UNITED STATES PATENT OFFICE.

HERBERT W. YOUNG, OF CHICAGO, ILLINOIS, ASSIGNOR TO DELTA-STAR ELECTRIC COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

SWITCH.

1,209,792. Specification of Letters Patent. Patented Dec. 26, 1916.

Application filed December 11, 1913. Serial No. 805,938.

To all whom it may concern:

Be it known that I, HERBERT W. YOUNG, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Switches, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to improvements in switches and particularly to that form of switch in which the movable member is adapted to rotate about an intermediate point whereby a circuit is broken simultaneously at two points.

It is one of the objects of my invention to provide a construction adapted for outdoor use by reason of which the switch may be readily opened when desired regardless of the snow and ice which may be gathered thereon.

It is another object of my invention to provide a coil in connection with the arcing horns through which the circuit is finally broken whereby when the rupture of the circuit occurs the arc may be blown up the horns by the magnetic field produced by the current flowing through the coil, thus accelerating the upward movement and the final breaking of the arc.

It is another object of my invention to provide a choke-coil in connection with a switch at each side thereof, which coils by their inductance tend to dampen out any high frequency surges which may be generated by the arc breaking in the air.

It is another object of my invention to improve devices of this type in sundry details hereinafter pointed out.

The means by which I have accomplished these objects are illustrated in the drawings and are hereinafter specifically described.

That which I believe to be new is set forth in the claims.

In the drawings:—Figure 1 is a perspective view of one of my improved switches, showing also an arm and links by which said switch is adapted to be operatively connected with a similar switch spaced at a proper distance therefrom; Fig. 2 is a top or plan view of the switch shown in Fig. 1, showing the switch in opened position, and showing in dotted lines an intermediate position of the rotating switch arm; and Fig. 3 is an enlarged detail of the contact elements at the left hand side of Fig. 1.

Referring to the several figures of the drawings in which corresponding parts are indicated by the same reference characters, 10 indicates a beam in the form of a channel-iron adapted to be mounted upon one or more posts or to be supported in any other suitable manner. In practice it is customary to have a plurality of switches such as that shown in Fig. 1 supported in parallel position at such a distance from each other as to permit of the swinging of the switch arms without interference, but it is believed to be sufficient to illustrate a single switch by which the invention may be fully illustrated.

11 indicates a vertical bar having a bearing in the beam 10 by which the insulator 12, mounted upon the upper end of said bar, may be rotated by means of the handle or lever 13 mounted upon the lower end of the bar.

14 indicates an arm extending from the bar 11, and 15 indicates links pivotally connected at one end to the outer end of the arm 14 and adapted to be connected at their other ends with a similar arm upon an adjacent switch by which the two switches may be operated in unison.

16 indicates a switch arm in the form of a copper bar fixed in any suitable manner upon the insulator 12 and adapted to rotate therewith, said switch arm having a steel bar 17 and an angle-iron 18 connected therewith to give stiffness thereto.

19—20 indicate insulators mounted upon suitable standards 21 rising from the beam 10.

22—23 indicate blocks secured in any suitable manner upon the insulators 19—20, respectively.

24 indicates laminated contact members, the lower plate of each of which is provided with a diagonally-positioned flap or wing

BEST AVAILABLE COPY

25, said contact members being secured in any suitable manner upon the blocks 22—23.

26—27 indicate binding blocks formed of conducting material by which the line wires 28 are connected to the contact members 24. As will be readily understood, when the insulator 12 is turned through the medium of the lever 13 from the position shown in Fig. 1, the switch arm 16 is moved in clockwise direction in Fig. 2, moving the ends of the bars 16—17 out from under the contact members 24. Thereupon when the switch arm 16 is moved in counterclockwise direction in said Fig. 2 the said bar 16 is adapted to resume its position under the contact members 24, a sufficient displacement of the bar 16 and of the laminated contacts 24 being procured for this purpose by reason of the diagonally-disposed wings 25, as will be readily understood. The parts are designed to be so shaped and so proportioned that a strong sliding contact shall be thus secured between the bar 16 and the contact members.

29 indicates arms connected to the blocks 22—23 and extending under the contact members 24 to serve as stops, limiting the movement of the switch arm 16 in closing.

30—31 indicate arcing horns mounted in any suitable manner upon the opposite ends of the switch arm 16.

32—33 indicate choke-coils mounted upon the binding blocks 26—27, respectively, and provided at their outer ends with horns 34—35. As best shown in Fig. 1, when the switch is in closed position the horns 30—34 at one end and the horns 31—35 at the other end contact each other at points some little distance above the switch arm. As the switch is opened, the horns have sliding contact, the point of contact approaching nearer the elbows at the lower ends of the horns as the switch is opened wider. As will be seen from an inspection of Fig. 2, when the bar 16 passes out of contact with the contact members 24 the horns are still in contact. Consequently the bar 16 is freed from the contact members 24 without an arc, the current continuing to flow through the switch and through the horns and choke-coils. By the time the switch is brought to the point where the horns are caused to finally break the contact, the bar 16 has been moved to a considerable distance from the contact members 24, with the result that the entire arc upon the final opening of the circuit occurs between the horns. Upon the breaking of the contact between the bar 16 and the contacts 24, the entire current is directed through the coils 32—33. This results in the setting up of a strong magnetic field about the coils 32—33. Accordingly when the final break occurs between the horns the rise of the arc upon the horns is materially accelerated by the magnetic blow-out effect of the coils. The result is that the arc is quickly dissipated with the consequent minimum bad effects.

By reason of the use of the choke-coils 32—33, the high frequency surges induced by the arc breaking in the air are damped out and prevented from reaching the line wires or the work.

By the expedient of mounting the arcing horn 34 in position with the coil 32 interposed between the horn and the clamping means by which it is secured in position, I have provided a resilient mounting for the horn 34. The arrangement is such that upon the closing of the switch the horn 34 is displaced to the left in Fig. 3 longitudinally of the coil and against the resilient action of the coil, the upper part of the coil being slightly compressed.

By reason of my construction in which an underwipe contact is secured between the switch arm and the contact members 24, the contact between the switch arm and the contact members is to a certain extent protected from the weather, preventing in many cases the accumulation of ice and snow at the contact point. Even in cases where freezing does occur at the contact point, the arrangement is such that the ice has no opportunity to lock the parts together. It has been found in actual practice that switches of the type described are capable of being readily operated under the most severe weather conditions, at which time it is of course the most necessary to have the switch in condition for easy operation.

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

1. In an electric switch, the combination of a flexible elongated coil having a plurality of turns arranged in series side by side, means for fixing one end of said coil in position, an arcing horn rising from the other end of said coil and held yieldingly in position thereby, and a second arcing horn movable into and out of contact with said first-named arcing horn for closing and opening the switch respectively, the arrangement being such that the operation of closing the switch has the effect of displacing the first-named arcing horn slightly from normal position against the resilient action of the coil.

2. In an electric switch, the combination of a flexible elongated coil having a plurality of turns arranged in series side by side, means for fixing one end of said coil in position, an arcing horn of comparatively great length as compared to the diameter of the coil formed integrally with the coil and rising from the free end thereof, and a sec-

ond arcing horn movable into and out of contact with said first-named arcing horn for closing and opening the switch respectively, the contact of the second arcing horn with said first-named arcing horn upon the closing of the switch having the effect of displacing the first-named arcing horn longitudinally of the coil out of normal position by a slight compression of the upper portion of the coil.

HERBERT W. YOUNG.

Witnesses:
W. H. De Busk,
W. A. Furnner.