May 22, 1928.

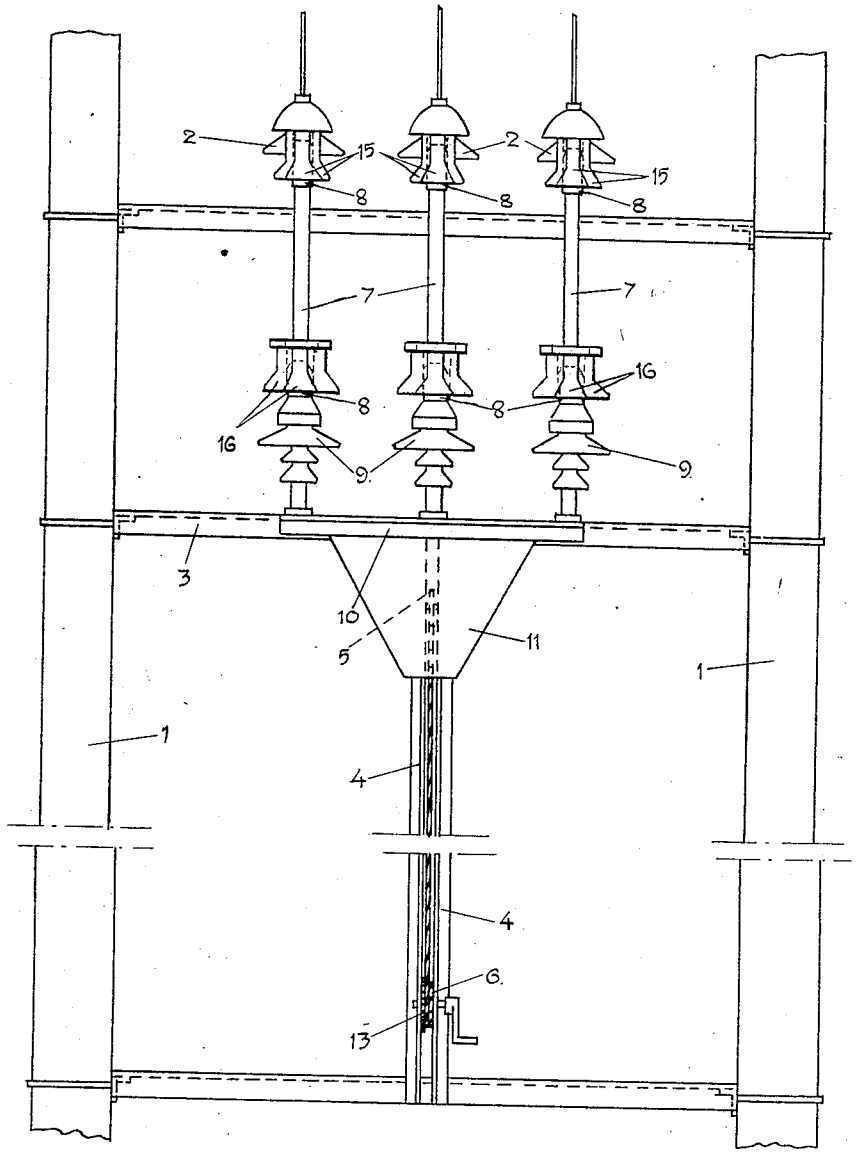
1,670,662

E. JOHNSON

HOISTABLE COMBINED DISCONNECTING SWITCH AND FUSE FOR OUTDOOR TRANSFORMERS AND TRANSMISSION LINES

Filed Jan. 14, 1924 2 Sheets-Sheet 1

Fig. 1.



Inventor:
E. Johnson
By Marks & Clerk
Attys.

May 22, 1928.

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Fig. 2.

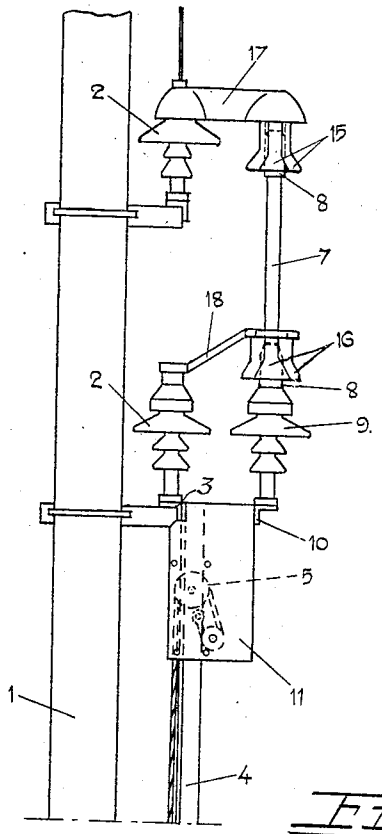


Fig. 3.

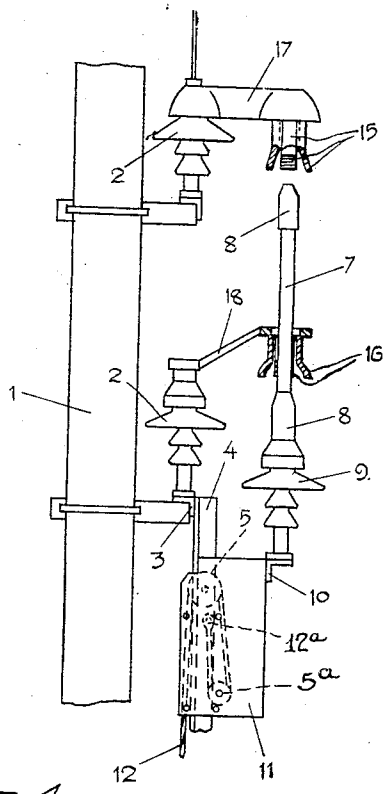


Fig. 4.

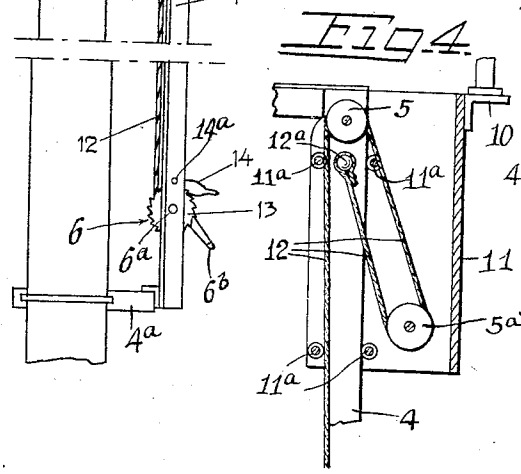
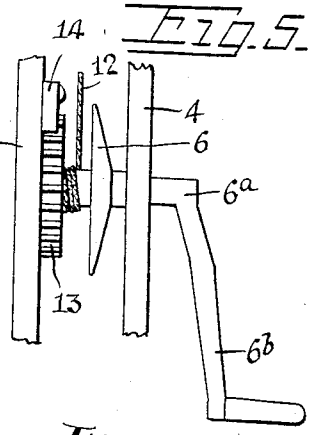


Fig. 5.



Inventor
E. Johnson
By Marks & Clark
Attys

Patented May 22, 1928. 1,670,662

UNITED STATES PATENT OFFICE.

EDWIN JOHNSON, OF PARTILLE, SWEDEN.

HOISTABLE COMBINED DISCONNECTING SWITCH AND FUSE FOR OUTDOOR TRANSFORMERS AND TRANSMISSION LINES.

Application filed January 14, 1924, Serial No. 686,181, and in Sweden June 27, 1923.

This invention relates to such combined disconnecting switches and fuses that are mounted outdoors. In such apparatus the fuses generally consist of an insulating tube with suitable contact pieces in each end between which the fuse wire is attached.

The object of this invention is to provide means for a safe and easy exchange of fuse wire with the operator standing on the ground without need for climbing up to the transformer.

Another object of this invention is to provide an easily operated electric switch which can be used as well for a fuse.

A further object of this invention is a combined switch and fuse of such a design, that the insulating ability to earth for the removable contact members is as good as the insulating ability for the stationary contact members.

The invention consists in the combination and arranging of the parts as described below and shown in the accompanied drawings. Said drawings however serve merely as a diagrammatical example to illustrate how the invention may be performed, and I do not want to limit myself to the special embodiment illustrated, but I must be free to vary the details and the appearance of the parts so as to fully suit the purpose without leaving the scope of the invention.

In the accompanied drawings an embodiment of the invention is shown diagrammatically whereby Fig. 1 is a front elevation view of the main portion of the transformer and its accessories, Fig. 2 a side view of the same parts showing the switch in closed position, and Fig. 3 a similar side view of the contacts in open position.

Fig. 4 is an enlarged vertical sectional view of a portion of the apparatus.

Fig. 5 is an enlarged elevation of a portion of the apparatus.

The apparatus consists mainly of two members namely the stationary member and the removable member.

In the drawing, 1 designates the poles, which as usual, are about twenty feet in height. Brackets are arranged at the upper ends of the poles and carry insulators 2 arranged in sets one above the other. The lower brackets support a transversely arranged angle iron 3. Two vertical angle irons 4 from tracks which extend from a bracket 4^a at the lower portion of the pole to the angle iron 3 and these tracks or rails are carried by the brackets. A pulley 5 is rotatably mounted between these rails near the upper ends of the same and is arranged on a horizontal axle which is stationary. A winding drum or pulley 6 is fixedly mounted on a shaft 6^a carried by the rails 4 and arranged near the lower ends of the same and this shaft has a handle 6^b to permit turning of the same by an operator standing at the foot of the poles.

Conducting rods 7 are provided having fuse sleeves 8 and these rods are carried by insulators 9 supported on an angle iron bracket 10 carried by a vertically movable carriage 11.

This carriage is provided with a pulley 5^a. A hoisting rope 12 has one of its ends secured to a pin or the like 12^a arranged near the upper end of one of the rails 4 and this rope is passed under the pulley 5^a over the pulley 5, downwardly between the rails and the other end of the rope is secured to the winding drum 6. The vertically movable carriage 11 has guiding rollers 11^a which ride on the rails 4 and guide the carriage. When the handle 6^b is turned in one direction, the rope 12 will be wound on the drum 6 and as a result the carriage 11 will be raised to its uppermost position. On the other hand when the handle is turned in the opposite direction, the carriage 11 will descend by gravity and will carry with it the rods 7 and fuse sleeves 8.

In order to lock the winding drum in various positions, the shaft 6^a is provided with a ratchet wheel 13 cooperating with a pawl 14 which may be locked in any set position by inserting a pin through the aperature 14^a which will prevent the pawl from lifting from the ratchet wheel.

The upper insulators 2 support conductors 17 connected to the line and provided with depending sleeves 15 formed by spring arms. The lower insulators 2 carry conductors 18 which are adapted to be connected to the transformer, and these conductors 18 support sleeves 16 formed by spring arms.

When it is desired to lower the fuse sleeves 8 from the upper ends of the poles to a position close to the ground, in order that they may be reached by the operator standing on the ground, the pawl 14 is released and the handle 6^b is turned to per-

mit the carriage 11 to descend and lower the rods 7 and fuse sleeves 8—8. The upper fuse sleeves 8 are smaller than the lower ones in order that the upper one may readily pass through the sleeves 16 when the carriage is raised or lowered.

From the foregoing it may be understood that with my device, an operator standing at the bottom of the poles may readily disconnect the fuse sleeves 8 from the spring sleeves 15 and 16 and lower the fuses to a point near the ground, so that the operator may work on the fuses or replace the same without liability of touching any high tension wires.

By the described hoisting device the current may be broken and the fuses be renewed by merely lowering down the bracket 10 with the removable contact members, which can be performed from the ground without climbing up the poles 1.

What I claim as new and want to protect by Letters Patent is:

1. In combination, a supporting surface, poles extending upwardly from said surface, stationary contact members and movable contact members mounted on said poles and normally arranged a sufficient distance above the supporting surface to prevent a person standing on the supporting surface from reaching the same, said movable contact members comprising fuses and adapted to break the circuit on movement away from the stationary contact members, a hoisting device carrying said movable contact members, means arranged sufficiently close to the supporting surface to permit an operator standing on the supporting surface to raise and lower the hoisting device so that the contacts may be disconnected and the movable contact members may be lowered within reach of the operator, stationary means attached to said poles for guiding said hoisting device vertically while lowering or raising the same.

2. A combination as claimed in claim 1 in which the hoisting device includes a vertically movable carriage said guiding means consisting of stationary guides attached to the poles and functioning as tracks for the carriage.

In testimony whereof I have hereunto affixed my signature.

EDWIN JOHNSON.