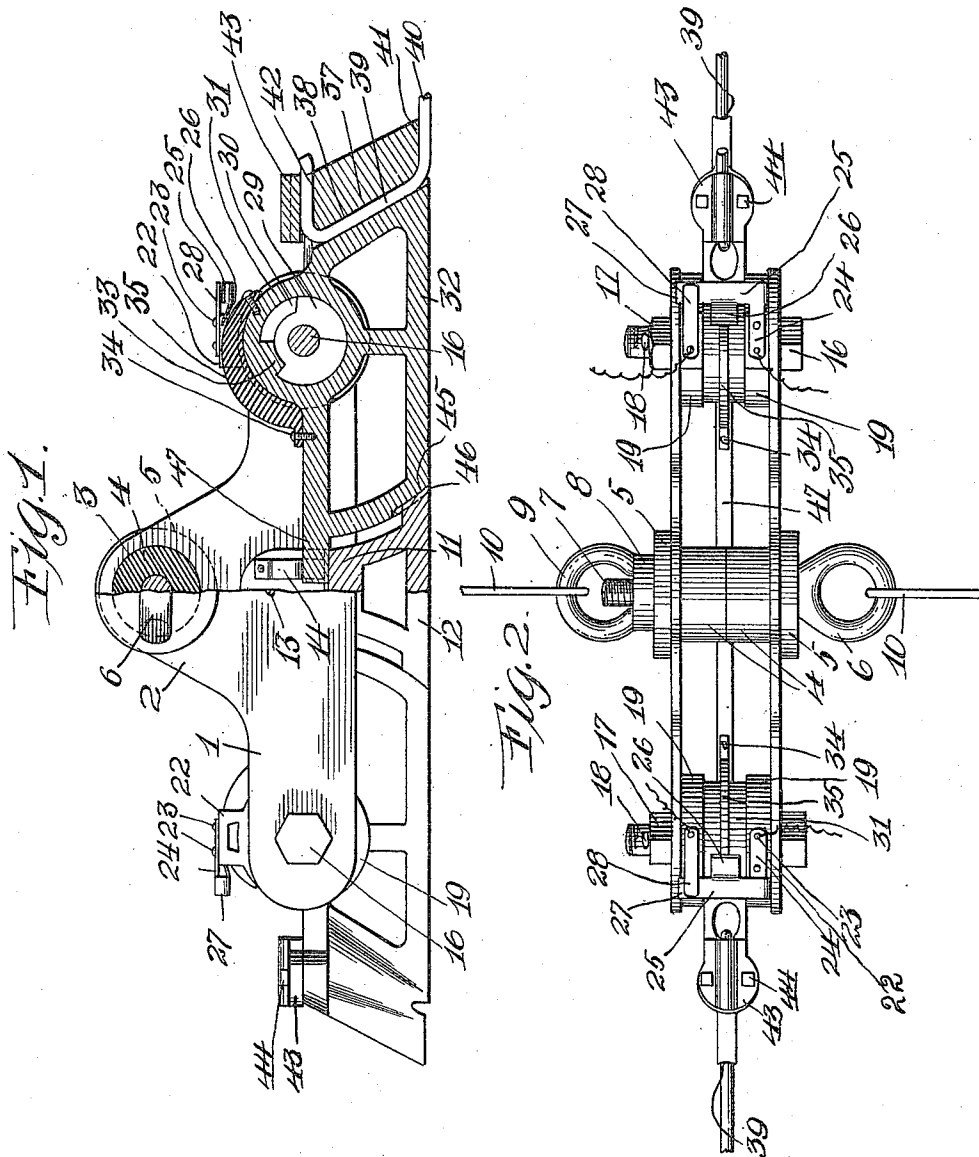


986,203.

Patented Mar. 7, 1911.

2 SHEETS-SHEET 1.



WITNESSES

Samuel Payne.
R. C. Butler

INVENTOR

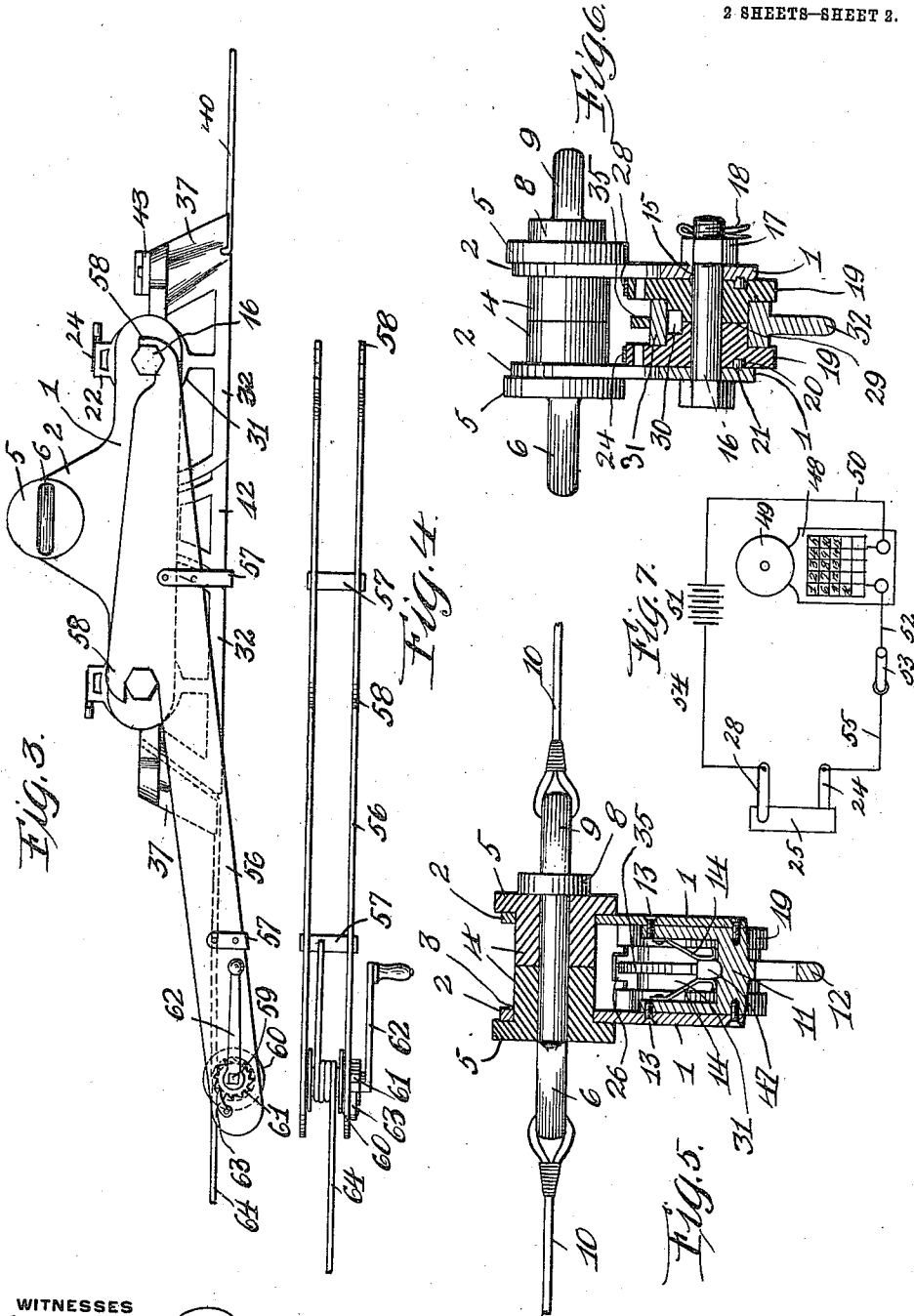
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WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN W. NOVAK, OF PITTSBURG, PENNSYLVANIA.

POWER-ARRESTER.

986,203.

Specification of Letters Patent.

Patented Mar. 7, 1911.

Application filed February 21, 1910. Serial No. 545,060.

To all whom it may concern:

Be it known that I, JOHN W. NOVAK, a citizen of the United States of America, residing at N. S. Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Power-Arresters, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention relates to a power arrester particularly designed for the over-head trolley systems of electric railways, trolley lines, exposed electric conductors, etc.

The paramount objects of my invention are to provide a trolley wire with a novel arrester that will break the electric circuit through the trolley wire and thus prevent the grounded trolley wire from affecting the remainder of the wire, and to furnish simple and effective means in connection with each arrester whereby an audible and visible signal will be given at a power plant or repair station whereby the break in the trolley wire can be easily determined and the repair crew sent to the proper locality.

Other objects of my invention are to provide an automatic power arrester that can be easily installed at various points throughout a trolley system, and to furnish a device in connection with the arrester that will permit of a motorman or conductor making temporary repairs.

Further objects of my invention are to furnish a trolley wire with a circuit breaker that will be normally retained in a closed position by the wire and released to break the circuit when the wire is broken between circuit breakers installed upon the line.

These and such other objects as may hereinafter appear are attained by the novel construction, combination and arrangement of parts to be hereinafter specifically described and then claimed.

Reference will now be had to the drawings forming a part of this specification, wherein there is illustrated a preferred embodiment of my invention, but it is to be understood that the structural elements thereof can be varied or changed, as to the size, shape and manner of assemblage without departing from the scope of the invention as claimed.

In the drawings: Figure 1 is a side elevation of the arrester partly broken away and partly in longitudinal section. Fig. 2 is a plan of the arrester. Fig. 3 is a side eleva-

tion of the same upon a reduced scale, showing an attachment for the arrester. Fig. 4 is a plan of the attachment. Fig. 5 is an enlarged cross sectional view of the arrester taken centrally thereof. Fig. 6 is a similar view of the arrester adjacent to one end thereof, and Fig. 7 is a diagrammatic view showing an audible signal circuit.

In the accompanying drawings the reference numerals 1 denote parallel plates having the upper edges thereof intermediate the ends provided with extensions 2, these extensions being provided with oppositely disposed openings 3 adapted to receive sleeves 4 of heads 5, said sleeves and said heads being preferably made of an insulating material, as porcelain or hard rubber. The sleeves 4 are adapted to extend into the openings 3 from the outer sides of the plates 1 with the heads 5 engaging said plates and the confronting ends of the sleeves 4 engaging one another. The sleeves 4 and the heads 5 are retained in position by an eye-bolt 6 extending through said heads and said sleeves and having the threaded end 7 thereof provided with a nut 8 having an eyelet 9. The eye of the bolt 6 and the eye 9 of the nut 8 are adapted to be attached to support wires 10 employed for holding the arrester in position with a trolley wire attached thereto.

The plates 1 have the confronting faces thereof centrally of the lower edge provided with a shoe, comprising a stirrup 11 and a depending skeleton transfer rail 12. The stirrup 11 is suitably secured to the confronting sides of the plates 1, preferably by screws 13, and the confronting faces of the stirrup are provided with two sets of inwardly projecting resilient contact arms 14, the object of which will presently appear.

Pivotally mounted between the ends of the plates 1 are trolley-wire-supporting and switch members, and as these members are identical in construction at the ends of the arrester, I deem it only necessary to describe in detail one of said members. The plates 1 at the ends thereof are provided with oppositely disposed openings 15 and adapted to extend through said openings are bolts 16 retained within said openings by nuts 17 and cotter pins 18, said cotter pins extending through the threaded ends of the bolts to retain the nuts 17 thereon. Arranged between the plates 1 and upon the bolts 16 are disks of insulation 19 having the

outer faces thereof provided with recesses 20 adapted to receive pins 21 carried by the confronting faces of the plates 1, said pins preventing the disks 19 from rotating. The upper portion of each of said disks is provided with a longitudinally-extending and hollow rectangular protuberance 22 of insulation and which is termed a bridge. Upon one of said bridges is secured by suitable fastening means 23 a contact arm 24 having a right-angular extension 25. This extension intermediate the ends thereof is provided with a lug 26 and at the free end thereof is bent upon itself, as at 27, to engage the resilient contact arm 28 suitably secured to the opposite bridge 22. It is to be noted that the disks 19 form an insulation between the contact arms 24 and 28 and that a circuit is completed through said arms when the extension 25 of the arm 24 is moved to engage the contact arm 28. The disks 19 are provided with inwardly projecting annular shoulders 29 adapted to have the confronting faces thereof contact with one another, and these annular shoulders at the confronting faces are cut away to form a segment-shaped slot 30.

Pivotaly mounted upon the annular shoulders 29 are the hubs 31 of trolley-wire-supporting and switch frames 32, these frames being of a skeleton formation adapted to longitudinally aline with the transfer rail 12 of the stirrup 11. The hub 31 is provided with an inwardly projecting lug 33 adapted to move back and forth in the slot 30, the lug and hub being limited in their movement by the ends of the slot 30, for a purpose that will hereinafter appear. Secured to the frame 32 and the hub 31 by a suitable fastening means, as screws 34 is a segment-shaped cam 35 made of insulation, and this cam is adapted to engage the lug 26 of the extension 25 of the contact arm 24 and raise said extension, whereby the free end thereof will engage the contact arm 28 and establish a connection between said arms. The frame 32 at the outer end thereof is enlarged to form a socket 37 having an angularly-disposed opening 38 formed therein for the end 39 of a trolley wire 40, the trolley wire extending through a groove 41 provided therefor in the lower edge of the socket prior to entering the opening 38. The upper end of the trolley wire 41 is adapted to be bent outwardly in a groove 42 provided therefor in the upper end of the socket 37, and the end of the wire is retained within said groove by a retaining plate 43 secured to the upper end of the socket by bolts 44 or other fastening means. The trolley wire 40 in entering the groove 41 is adapted to longitudinally aline with the lower edge of the frame 32, and the opposite edge of said frame is provided with a groove 45 adapted to receive a tongue 46

carried by the end of the rail 12, this tongue when fitting within the groove 45 forming a connection between the rail 12 and said frame. To further insure a positive connection between said frame and the rail 12, the upper edge of the frame 32 is provided with an extension 47 projecting into the stirrup 11 and frictionally engage between the contact arms 14. Since these arms are carried by the stirrup 11 it is evident that either through the medium of said arms or the tongue and groove connection of the rail 12 and the frame 32, that a current can be carried from the wire 40 through the frame 32 to the transferring rail 12.

In Fig. 7 of the drawings, I have shown a conventional form of annunciator 48 having an alarm 49. The annunciator is connected by a wire 50 to a suitable source of electric energy as a battery 51, and by a wire 52 to a switch 53. The annunciator, battery and switch are adapted to be located in a power or repair station, and the battery 51 is adapted to be connected by a wire 54 to the contact arm 28, while the switch 53 is adapted to be connected by a wire 55 to the contact arm 24.

In the operation of the arrester, the trolley-wire-supporting members 32 and the rail 12 are adapted to establish a circuit between the trolley wires 40 held by the members, but should one of these wires break between two arresters, the weight of the wire is sufficient to tilt the members, the tilting movement of said members being limited by the lugs 33 within the slots 30, thus preventing the members when tilting from swinging around to that degree as to cause the socket end of the member to contact with the rail 12. When the members are tilted the cams of insulation 35 contact with the lugs 26 and raise the extensions 25, whereby an alarm circuit will be established through the arms 24 and 28 to notify the power or repair station that a break has occurred in the trolley wire.

In order that a break in the trolley wire can be easily repaired, I devised a novel ratchet mechanism adapted to be attached to the heads of the bolts 16 and the nuts 17. The ratchet mechanism comprises side plates 56 connected by straps 57. The side plates are provided with hook-shaped ends 58 adapted to engage the heads of the bolts 16 and the nuts 17. The side plates 56 are adapted to extend downwardly at an angle to the plates 1 and revolvably mounted in the lower ends of said plates is a shaft 59 supporting a spool 60, a ratchet wheel 61 and a crank handle 62. A gravity pawl 63, carried by one of the side plates 56 is adapted to engage the ratchet wheel 61.

A cable 64 is adapted to be attached to the broken end of the trolley wire and the cable wound upon the spool 60 to draw the trolley

wire taut, whereby the end of another trolley wire secured to the end of the broken wire can be drawn taut and connected to the arrester. In some instances an ordinary piece of wire capable of transmitting the current can be attached to the broken end of the trolley wire, wound upon the spool 60 to raise the broken end of the trolley wire, and then the end of the ordinary piece of wire attached to the arrester, thereby completing a circuit through the arrester and allowing a car to proceed, by lowering the trolley pole as the car passes under the arrester, thereby allowing a quick repair to be made until the trolley wire can be permanently fixed.

From the foregoing it will be observed that the plates 1 constitute a housing for the tiltable trolley-wire-supporting and switch members and for the auxiliary switches adapted to control the alarm circuit.

What I claim, is:

1. A power arrester comprising a pair of longitudinally-extending supporting members arranged parallel and connected together, a stirrup interposed between and connected to said members and carrying a shoe, contacts within the stirrups, a tiltable trolley wire support connected to the members at each end thereof and provided with an extension engaging said contacts, each of said supports provided with means for coupling a conductor thereto and each of said supports furthermore having its lower end flush with the lower end of the shoe.

2. A power arrester comprising a pair of longitudinally-extending supporting members arranged parallel and connected together, a stirrup interposed between and connected to said members and carrying a shoe, contacts within the stirrups, a tiltable trolley wire support connected to the members at each end thereof and provided with an extension engaging said contacts, each of said supports provided with means for coupling a conductor thereto and each of said supports furthermore having its lower end flush with the lower end of the shoe, said extensions constituting means for limiting the tilting movement of the supports in one direction, and means whereby the tilting movement of the supports is limited in the other direction.

3. A power arrester comprising a pair of longitudinally-extending supporting members arranged parallel and connected together, a stirrup interposed between and connected to said members and carrying a shoe, contacts within the stirrups, a tiltable trolley wire support connected to the members at each end thereof and provided with an extension engaging said contacts, each of said supports provided with means for coupling a conductor thereto and each of said supports furthermore having its lower

end flush with the lower end of the shoe, said extensions constituting means for limiting the tilting movement of the supports in one direction, means whereby the tilting movement of the supports is limited in the other direction, and each of said extensions having its inner end provided with a groove, and tongues projecting from the shoe and extending in said groove.

4. A power arrester comprising a pair of longitudinally-extending members, a stirrup connected thereto and provided with a shoe, contacts carried by the stirrup, tiltable trolley wire supports independent of each other and connected with said members, said supports when in normal position alining with said shoe, an extension carried by the supports and projecting into the stirrup and engaging said contacts, each of said supports provided with means for connecting a trolley conductor thereto.

5. A power arrester comprising a pair of longitudinally-extending members, a stirrup connected thereto and provided with a shoe, contacts carried by the stirrup, tiltable trolley wire supports independent of each other and connected with said members, said supports when in normal position alining with said shoes, an extension carried by the supports and projecting into the stirrup and engaging said contacts, each of said supports provided with means for connecting a trolley conductor thereto, each of said supports having its inner end provided with a groove, and tongues projecting from the shoe and engaging in said grooves.

6. A power arrester comprising a pair of longitudinally-extending members, a stirrup connected thereto and provided with a shoe, contacts carried by the stirrup, tiltable trolley wire supports independent of each other and connected with said members, said supports when in normal position alining with said shoe, an extension carried by the supports and projecting into the stirrup and engaging said contacts, each of said supports provided with means for connecting a trolley conductor thereto, each of said supports having its inner end provided with a groove, tongues projecting from the shoe and engaging in said grooves, said extensions provided with means for limiting the tilting movement of the supports in one direction, a bearing of insulation for each of said supports, and means carried by the supports and engaging said bearings for limiting the movement of the supports in the opposite direction.

7. A power arrester comprising a pair of longitudinally-extending members, a stirrup connected thereto, and provided with a shoe, contacts carried by the stirrup, a tiltable trolley wire supports independent of each other and connected with said mem-

bers, said supports when in normal position
alining with said shoe, an extension carried
by the supports and projecting into the stir-
rup and engaging said contacts, each of said
5 supports provided with means for connect-
ing a trolley conductor thereto, each of said
supports having its inner end provided with
a groove, tongues projecting from the shoe
and engaging in said grooves, said exten-
10 sions provided with means for limiting the
tilting movement of the supports in one di-
rection, a bearing of insulation for each of
said supports, means carried by the supports

and engaging said bearings for limiting the
movement of the supports in the opposite 15
direction, means carried by said bearing for
closing a signaling circuit, and an insulated
means carried by said support for operating
said circuit closing means.

In testimony whereof I affix my signature 20
in the presence of two witnesses.

JOHN W. NOVAK.

Witnesses:

JOS. P. VILK,
K. H. BUTLER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
