Sept. 29, 1931. H. J. KRATZER 1,825,002

ELECTRIC AIR BREAK SWITCH

Filed May 11, 1925

Fig. 1.

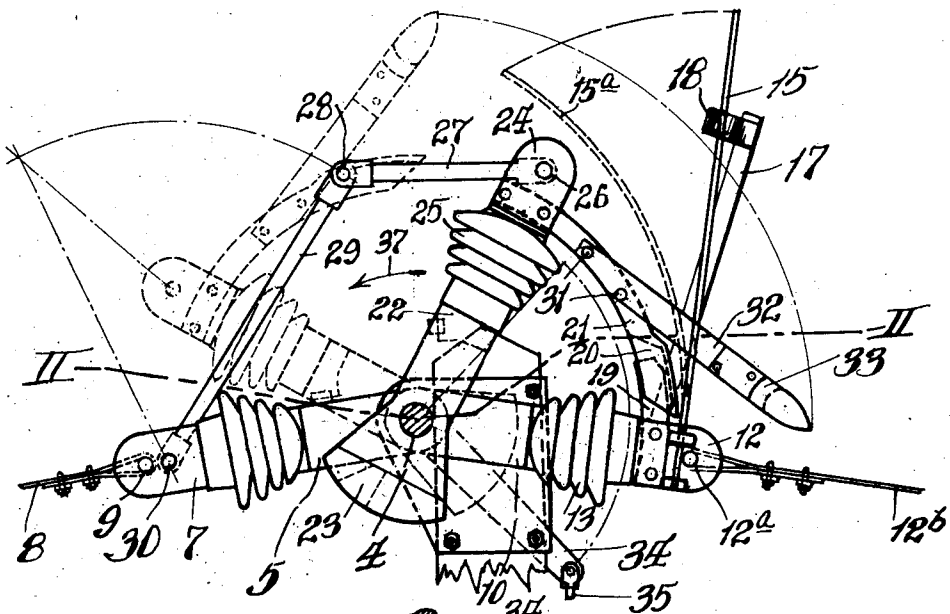
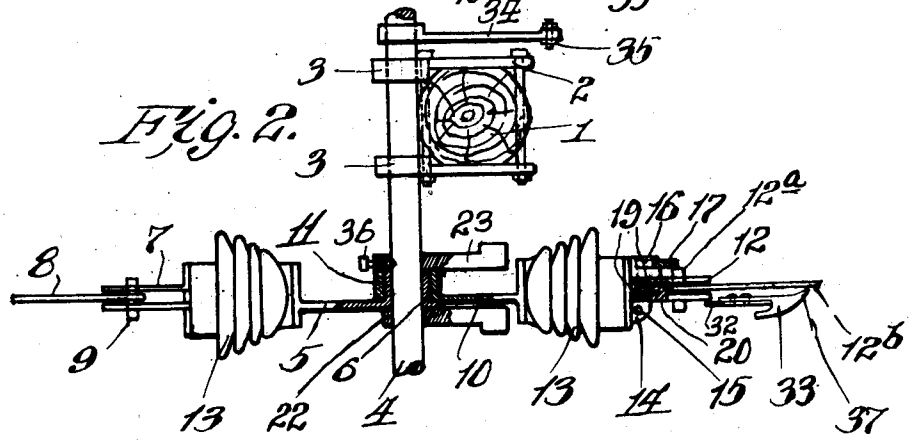


Fig. 2.



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ELECTRIC AIR-BREAK SWITCH

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This invention relates to an improvement in electric switches, one of the objects being to provide an improved or simplified arrangement of parts for the closing and opening or making and breaking of an electric circuit in a metallic conductor.

In all types of electric circuits both the closing and opening operation are accompanied by an arcing of the current between the ends of switch points due to the breaking down of dielectric properties of material between the switch points. In circuits having high potentials and current values such as are encountered in modern transmission systems, heavy arcs occur at the switch points of a switch due to charging currents at opening or closing operations of the switch and particularly at the opening of the switch.

In the operation of opening a switch, a path of high resistance between the ends of the metallic conductors or switch points is interposed and a heavy electric arc of intense heat is created and in consequence the switch points are burnt and pitted in a manner where in a short space of time they are required to be replaced.

Another object of the invention is in providing an electric switch with an auxiliary contact point.

A further object of the invention is in providing an electric switch with means whereby the breaking of the switch points can be carried on with a predetermined rapidity.

A still further object of the invention is in providing an electric switch with an additional pair of contact points which remain in contact for a period of time after the main contact points have been disconnected from one another.

Other and further objects will appear in the specification and be specifically pointed out in the appended claims, reference being had to the accompanying drawings, exemplifying the invention, and in which:

Figure 1 is a side elevation of this improved switch.

Figure 2 is a horizontal section taken approximately on the line II—II of Fig. 1.

Referring by numerals to the accompanying drawings, 1 designates a supporting post having a bracket 2 secured thereto and formed in said bracket is a pair of bearings 3 and horizontally supported in said bearings is a turnable shaft 4, said shaft being supported at its opposite end by a similar bracket and post not shown.

Mounted on and extended from the shaft 4 is a dead-end insulating member 5, said member having a hub 6 which is engaged over the shaft 4 and at its opposite end being provided with a bifurcated portion 7, and engaged between said bifurcated portion is one end of a line wire 8 which is secured to the portion 7 by a pin or bolt 9.

Oppositely disposed from the dead-end insulating member 5 is a dead-end insulating member 10, said member 10 having a hub 11 formed thereon which is mounted over the hub 6 of the member 5 and formed on said member in opposite disposition to the hub 11 is a bifurcated portion 12 and secured to said portion 12 by the pin 12*a* is one end of a load-wire 12*b*. Each of the members 5 and 10 are provided with an intermediately arranged insulated portion 13 for the purpose of preventing current being transmitted through said members.

Formed on the bifurcated portion 12 of the member 10 is a lug 14 and extended upwardly from said lug is a vertically disposed resilient contacting rod 15 and formed on the opposite side of said portion 12 is a lug 16 having a supporting leg 17 upwardly extended therefrom and secured to the upper end of said leg 17 is a pair of paralleling spring-clips 18 which are adapted to cooperate with the upper portion of the rod 15.

Extended upwardly from the portion 12 of the member 10 is a pair of stationary switch contacts 19 and for co-operation therewith is the hooded end 20 of a movable contact blade 21, said blade 21 being secured to a lever 22 which is secured on the shaft 4.

The lever 22 is provided with a counter balanced end 23 and an oppositely disposed end 24 to which the blade 21 is secured, and interposed between said ends 23 and 24 is an insulating portion 25.

Pivoted at 26 to the end 24 of the lever 22 is a link 27, said link being secured at 28 to

a link 29 which is pivoted at 30 to the bifurcated portion 7 of the insulating member 5 and secured at 31 to the blade 21 is an auxiliary contacting blade 32 which is disposed in sliding engagement with the contact rod 15. Secured to the extending end of the auxiliary blade 32 is a hook 33 for co-operation with the contact rod 15.

From an inspection of Fig. 1, it will be noted that the switch is in a closed position and in which the current will travel along the load-wire 12*b* through the bifurcated portion 12 and contact points 19 extending therefrom and through the switch blade 21 and to the links 27 and 29 and to the line-wire 8 through the bifurcated portion 7.

For operating the switch, a lever 34 is rigidly secured at one end to the shaft 4, said lever at its opposite end having an operating rod 35 depended therefrom to a position in easy reach of the operator and when it is desired to open the switch a pushing effort is given to the rod 35 thereby causing the lever 34 to turn the shaft 4 and inasmuch as the switch lever 22 is rigidly secured to the shaft 4 by the set screw 36, said switch lever is caused to be swung in the direction indicated by the arrow 37 in Fig. 1 and in which the contacting portion 20 of the switch blade 21 will be disconnected from the contact points 19. On account of the auxiliary blade 32 which is secured to the switch blade 21 being in sliding contact with the contact rod 15, there will be no interruption of the current flow when the contacts 19 and 20 are parted as the current will continue to flow through the switch blade 21 by reason of the current traversing the contact rod 15 and auxiliary blade 32. As the swinging movement of the lever 22 continues, the auxiliary blade 32 will slidingly engage the rod 15 and inasmuch as the hook portion 33 of the blade 32 is disposed so as to overlap the rod 15, said rod will be engaged by the hook 33 and the rod will be disengaged from the spring-clips 18 and bent by the pulling force of the hook 33 in the direction indicated by dotted lines 15*a*, Fig. 1, the hook 33 releasing the rod 15 as soon as it has traveled to the upper end of the rod and inasmuch as the rod 15 is resilient said rod upon being released will whip away from contacting engagement with the hook 33 with great rapidity and will be engaged and held by the spring-clips 18 immediately upon the return of said rod to its normal position. The rod upon being released from the hook 33 of the auxiliary blade 32 will leave its contacting position with the hook 33 with such speed and quickness whereby little or no arcing will be drawn between the hook 33 and the rod end and in consequence there will be no arcing flame formed and the rod 15 and hook 33 will not therefore be burnt or pitted.

When it is desired to close the switch, a pulling force is given to the operating rod 35 and the switch lever 22 will be swung into its former position and during the return swinging movement of said lever 22, the deflecting portion 37 which is formed on the hook 33 will engage the rod 15 thereby slightly bending said rod to one side and in which the auxiliary blade 32 will be slidingly engaged against said rod.

If it is desired, more than one switch of the character disclosed can be mounted upon the same shaft and the operating thereof will be simultaneously carried on with the turning of the shaft.

It is to be noted that the mounting of the switch is greatly simplified in that the shaft 4 which operates the switch also serves as a sole support for the switch and in addition thereto the dead-end insulators 5 and 10 which support respective wires 8 and 12*b*, are also supported from the shaft 4. This improved mounting construction while being inexpensive in its manufacture can be mounted in place with a minimum amount of labor.

What I claim is:—

1. An electric switch comprising a blade, a contact member for said blade, an auxiliary blade having a hook portion extending from said blade, a stationarily held contact member for said auxiliary blade, said auxiliary blade being in sliding contact with said last mentioned contact member adapted to have the hook portion thereof engage and flex said contact member, and catching means cooperable with said contact member after it has been flexed and released by said hook portion.

2. An electric switch comprising a lever, a blade extended from said lever, a contact member for said blade, an auxiliary blade extended forwardly of said blade adapted to be moved with said lever, a stationarily held resilient contact member for co-operation with said auxiliary blade being in sliding engagement therewith, hook means on the extending end of said auxiliary blade adapted to over-engage and flex said resilient contact member as said blade is being moved by said lever, and catching means cooperable with said contact member for preventing rebound thereof.

3. An electric switch comprising a lever, a contact member for said lever, said lever having a portion for co-operation with said contact member, an operating shaft for said lever on which said lever is mounted, and a pair of dead-end insulators supported transversely from said shaft.

4. In an electric switch, a horizontally supported shaft, a pair of dead-end insulators supported from said shaft and extended transversely thereof, a contact member mounted on one of said insulators, a lever secured to said shaft, a blade extended from said lever for co-operation with said contact

member, and means secured to said shaft for rocking it.

5. An electric switch having a blade and a flexible contact co-operable therewith, said blade having means for engaging and drawing said contact in the direction of the opening travel of the blade, said blade adapted to slidably engage said contact and permit said contact to swing in the opposite direction, and catching means for said contact for preventing rebound thereof.

6. In an electric switch, an operating shaft, a lever mounted on said shaft, a contact member for said lever, and conductors supported transversely from said shaft.

7. An electric switch having a blade and a flexible contact cooperable therewith, said blade having means for engaging and drawing said contact in the direction of the opening travel of the blade whereby said blade will slide from the end of said contact and permit said contact to swing with rapidity in an opposite direction, and catching means cooperable with said contact for preventing rebound thereof.

8. An electric switch comprising a lever, a contact member for said lever, said lever having a portion for cooperation with said contact member, an operating shaft to which said lever is mounted, and a pair of dead-end insulators supported transversely from said shaft resiliently supported at their extending ends.

9. An electric switch comprising an operating shaft, supports for said shaft, a lever fixed on said shaft, a contact member for said lever, and conductors supported transversely from said shaft having swinging connection therewith.

10. An electric switch comprising an operating shaft, a lever fixed on said shaft, a contact member for said lever, and conductors swingingly mounted at one end on said shaft.

11. An electric switch comprising an operating shaft, a lever fixed on said shaft, a contact member for said lever, and conductors swingingly supported at one end on said shaft, and resiliently supported at their extending ends.

12. An electric switch comprising an operating shaft, a lever fixed on said shaft, a contact member for said lever, conductors swingingly supported at one end on said shaft, and a line wire connected to each conductor.

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