April 27, 1954 A. H. GENTER 2,677,020

TROLLEY WIRE SECTION SWITCH

Filed Nov. 17, 1950 2 Sheets-Sheet 1

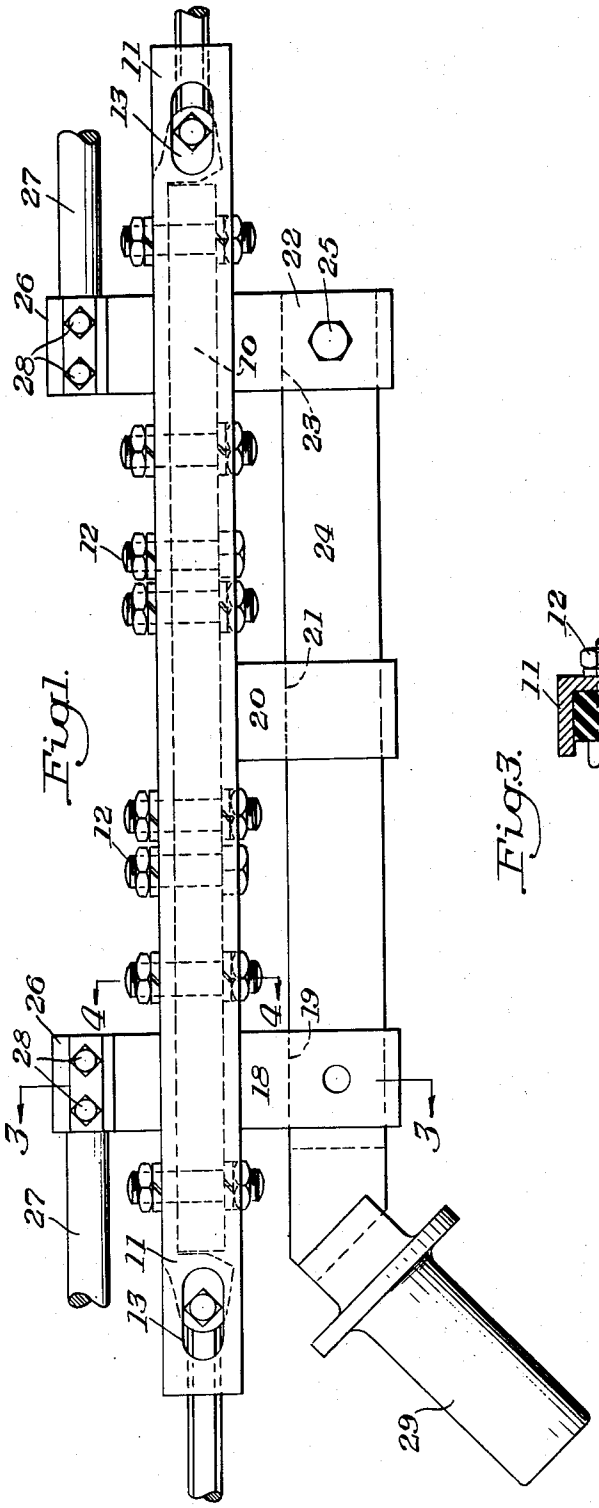


Fig1.

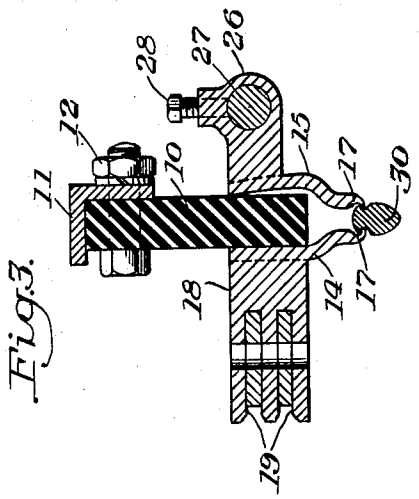


Fig3.

INVENTOR.
Albert H. Genter.
BY
Edward A. Laurence.
HIS ATTORNEY.

April 27, 1954 A. H. GENTER 2,677,020

TROLLEY WIRE SECTION SWITCH

Filed Nov. 17, 1950 2 Sheets-Sheet 2

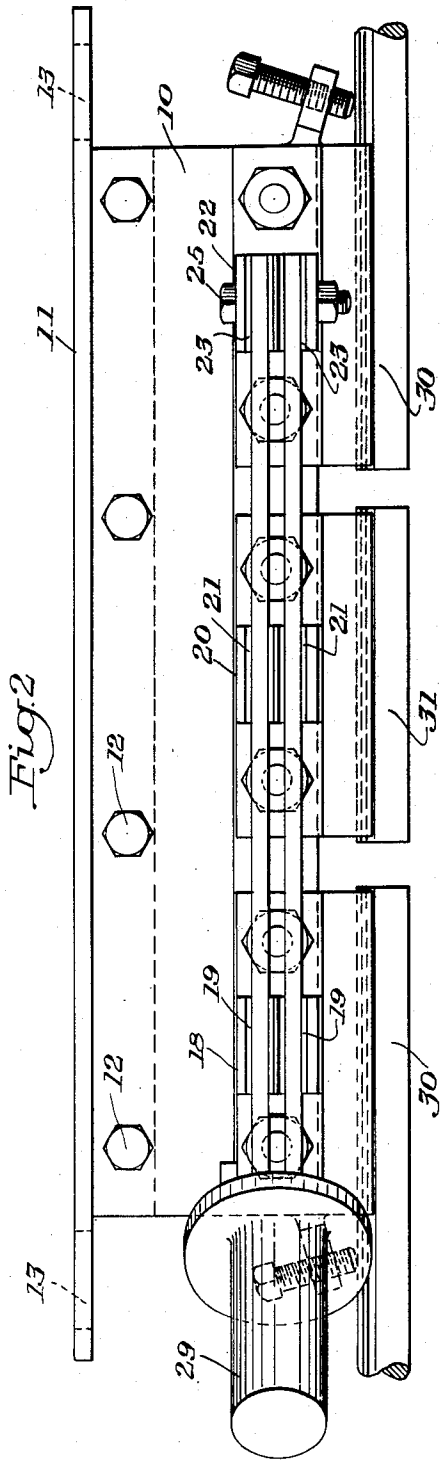


Fig. 2

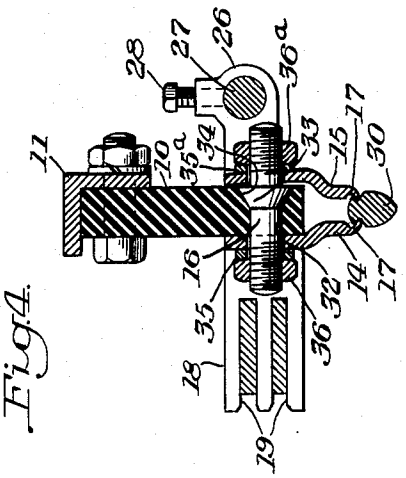


Fig. 4

INVENTOR.
Albert H. Genter.
BY
Edmund A. Laurence
HIS ATTORNEY.

Patented Apr. 27, 1954 2,677,020

UNITED STATES PATENT OFFICE

2,677,020

TROLLEY WIRE SECTION SWITCH

Albert H. Genter, Mount Lebanon, Pa.

Application November 17, 1950, Serial No. 196,233

2 Claims. (Cl. 191—39)

1

Where, as in a mine, the electrical current supplied from the feed wires to the section trolley wires is controlled by section switches, the interengaging elements, such as the hinged knife blade and the slotted jaw blocks of the switch must be maintained in proper relative position and accurate alignment to readily engage and disengage as the switch is closed or opened, inasmuch as any misalignment would prevent the successful operation of the switch. It is also important that the trolley wires be secured to the switch in such manner that they may be attached to the switch structure and detached therefrom without disturbing the connection of the feed wires to the switch.

Again the switch must be constructed so that it may be arranged for use either as a right-hand switch or a left-hand switch, as occasion demands.

Also the switch must be so constructed that when the switch is arranged to conduct current therethrough, there will be no leakage of electric current.

The type of section switches now in general use are not designed to solve the difficulties, and therefore fail to properly serve the requirements when operating under a heavy current flow.

My improved trolley wire section switch, hereinafter described, meets the requirements of a successful switch. When the switch is closed for the passage of current the knife blade of the switch connects in circuit with electric conductive material the point of attachment of the feed wires and the depending jaw plates which grip the trolley wire, so that no loss or leakage of current occurs. Again the trolley wires may be secured to and disconnected from the switch without disturbing the connections of the feed wires, and vice versa, the feed wires may be disconnected from the switch without disturbing the trolley wires.

In the accompanying drawings, which illustrate a practical embodiment of the principles of my invention,

Fig. 1 is a top plan view of the section switch;

Fig. 2 is a side elevation of the same; and

Figs. 3 and 4 are cross-sectional views taken along the lines 3—3 and 4—4 in Fig. 1, respectively.

Referring in detail to the drawings, 10 indicates a plate, preferably of rectangular elongated shape and formed of suitable insulating material such as a dielectric plastic. A metal bar 11 of angular cross-sectional shape is secured to the top edge of the insulator plate 10,

2

as by means of bolts 12, which extend through holes in the depending flange of the angle bar and registering bolt holes in the insulator plate 10 adjacent the top edge of the latter. The ends of the angle bar 11 extend beyond the ends of the insulator plate 10 and are provided with holes 13 through which expansion bolts may be extended and tightened in holes in the mine roof to support the switch therefrom, or through which screw bolts may be extended to secure the switch to an overhead timber support.

Three pairs of jaw members are mounted on and depend from the insulator plate 10 at spaced intervals, each pair comprising plates 14 and 15 formed of conductive material, such as bronze. The jaw members 14 fit flat against the vertical side surface of the insulator plate 10 and extend below the latter, while the members 15 are arc-shaped, being curved longitudinally or otherwise formed so that their upper ends contact the side of the plate 10 opposite to the members 14, but the said plates 15 are otherwise out of contact with the said insulator plate. The lower extremities of the jaw members 14 and 15 are provided with inwardly facing trough-like grooves 17 which grasp the trolley wire sections from either side of the latter and clamp the same securely to the switch structure.

The pairs of jaw members 14—15 are secured to the opposite sides of the insulator plate 10 by means of bolts 16 which are formed of conductive material, such as steel or bronze, and which are later described in more detail. These bolts extend through holes in the upper portions of the pairs of jaw members and through registering holes in the insulator plate 10.

The jaw members 14 of the pair of members adjacent one of the ends of the insulator plate 10 is provided with an integral outwardly extending boss 18 which is slotted horizontally to provide parallel slots 19. The corresponding jaw member 14 of the pair of jaw members intermediate the bar 11 is likewise formed with a similar boss 20 provided with like parallel slots 21, while the jaw member 14 of the pair adjacent the other end of the bar 11 is provided with a similar boss 22 formed with similar slots 23. The bosses 18 and 22, adjacent the two ends of the bar 11, are punched with registering holes through their blades which are formed by the slots to provide for a pivotal connection for the double knife blade switch lever 24 which can thus be hinged by a bolt 25 at a point adjacent either end of the insulator plate to provide either a right-hand switch or a left-hand switch,

as may be suitable for the particular installation. The parallel blades of the remaining jaw members 14 are thus engaged when the switch is swung into its closed position with its blades engaged in the slots of the bosses, thus electrically connecting the bosses 18, 20 and 22. The double knife blade switch blade 24 is also formed of conductive material.

The corresponding members 15 of the end pairs of jaw plates 14—15 are provided on their outer surfaces with tubular sleeves 26 or other means in which the ends of the spaced sections 27 of the feed wire may be secured, as by the set screws 28. Thus the jaw members 14—15, adjacent the opposite ends of the insulator plate 10, are maintained in electrical conductivity with the feed wire sections 27, and when the switch lever 24 is in its closed position, as shown in Figs. 1 and 2, electric current is supplied to all three pairs of jaw members 14—15. The switch lever 24 is provided with an insulating handle 29.

30 indicates the interrupted and spaced apart ends of the trolley wire sections which are grasped and firmly held by the jaw members 14—15 adjacent the ends of the insulator plate 10 and a short intermediate section 31 of trolley wire is grasped by the central pair of jaw members, said intermediate section being short enough to provide insulating gaps between its ends and the section 30 and to prevent the direct flow of current therethrough when the switch is open. The intermediate section 31 prevents the trolley wheel from jumping from the wire as the car passes beneath the section switch.

The bolts 16, which are threaded at both ends, are employed to secure the pairs of jaw members 14—15 to the insulator plate 10, said bolts being of steel or other suitable conductive material and are arranged to extend through the registering holes 32 in the insulator plate 10 and the jaw members 14—15.

The end portions of the holes 32 in the insulator plate 10, adjacent the face of said plate at which the jaw members 15 are to be mounted, are provided with countersunk, preferably conical, seats or enlargements 33, and the bolts 16 intermediate of their extremities, are provided with corresponding enlargements 34 shaped to fit said seats 33. Thus in assembling the switch at the factory or shop, the bolts are inserted from the right in Fig. 4 with the enlargements 34 seated in the seats 33. The jaw members 14 are then placed in position with the left-hand extremity of the bolts protruding outwardly through the jaw member. The washers 35 are then slipped on the extremities of the bolts against the jaw plate and the nuts 36 are applied to the bolt end and tightened to clamp the jaw plates 14 fixedly to the insulator plate 10. The switch is then ready for installation, being first secured to the mine roof or overhead support by means of expansion or other bolts extending upward through the holes 13 in the ends of the angle bar 11 into the roof or overhead structure. The feed wire end portions 27 are then inserted in the sleeves 26 and the set screws 28 are tightened against the same.

The end portions of the trolley wire sections 30 are then placed in grooves 17 in the jaw members 14 of the end pairs of jaw members 14—15 and the intermediate section 31 of the trolley wire is placed in the groove 17 of the plate 14 of the central pair of plates 14—15, the corresponding jaw members 15 are then mounted on the right-hand end of the bolts 16 in Fig. 4, and the washers 35 and the nuts 36*a* are mounted on the bolts and screwed up against the jaw members 15, causing the members 15 to swing on their upper extremities where they engage the side of the insulator plate, thus moving the lower end portions of the members, which are provided with the groove 17, to engage the trolley wire sections already correspondingly engaged by the lower end of the corresponding members 14.

When the trolley wire sections are to be released from the switch, all that is necessary is to loosen the nuts 36*a*, causing the members 15 to be relieved from pressure so that they may be backed off sufficiently to release the trolley wire sections.

The intermediate trolley wire section 31 is a dead section which is intended to prevent the accidental flow of current from the hot end of the switch, when the switch handle is in its off position, to the cold end of the switch, which might occur in case the current collector, when the switch is in its off position, halts in place to bridge the spaced ends of the trolley wire sections. By the provision of the dead trolley wire section, which is of sufficient length that the collector is unable to bridge the ends of the two sections 30, but will engage either one of the sections 30 and the intermediate dead section 31, such an accident is prevented.

When the trolley wire sections are to be disconnected the bolts 36*a* are backed off to release the trolley wire sections from the pairs of jaw plates. The ends of the feed wire 27 are then released from the tubular sleeves 26. The bolts securing the plate 10 to the mine roof or structure are then withdrawn and the section switch as a unit may then be removed for repairs or replacements.

The jaw members 14—15 are formed as is the switch lever 24 of electrically conductive material, such as bronze, so that there will be no obstruction in the flow of current from the feed line sections to the trolley wire sections when the switch is closed for the conduction of current, thus providing a direct connection of conductive material between the feed wires and the trolley wires.

I claim:

1. A trolley wire section switch comprising an elongated plate of dielectric material, a hanger independently secured to said plate for suspending it from an overhead support, three spaced pairs of coacting jaw members for gripping axially aligned and spaced apart sections of trolley wire, the upper portion of each jaw member of a pair being on opposite sides of said plate, one jaw member of each pair having only its upper edge engaging said plate, the lower edge of each jaw member having a grip to engage one side of a trolley wire remote from the collector underrun portion thereof, said plate and jaw members having registering holes below the upper edge of the latter, a bolt means extending through said registering holes to clamp said jaw members on said plate and on said trolley wire sections, aligned switch blade receiving means on one of each pair of coacting jaw members, and switch means for electrically connecting the blade receiving means on each of the jaw members along one side of said plate.

2. The structure of claim 1 characterized in that said bolt means are threaded at both ends, a head on each bolt intermediate the threaded ends, a recess adjacent each hole in said plate and complementary to said heads, and nut mem-

bers for said bolt ends to clamp the jaw members carrying the switch blade receiving means to said plate independently of the other jaw members of each pair and to clamp the trolley wire sections.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
197,721	Cornell	Dec. 4, 1877
228,429	Williams	June 1, 1880
868,368	Steinberger	Oct. 15, 1907
948,789	Mead	Feb. 8, 1910
1,451,559	Wahlberg	Apr. 10, 1923
1,962,259	Ritchie et al.	June 12, 1934
2,492,300	Lewis	Dec. 27, 1949
2,495,569	Conrad	Jan. 24, 1950
2,596,022	Genter	May 6, 1952