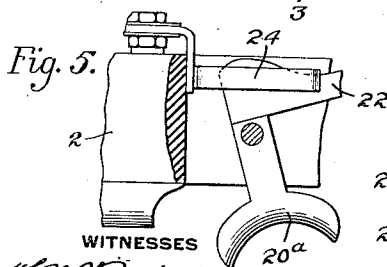
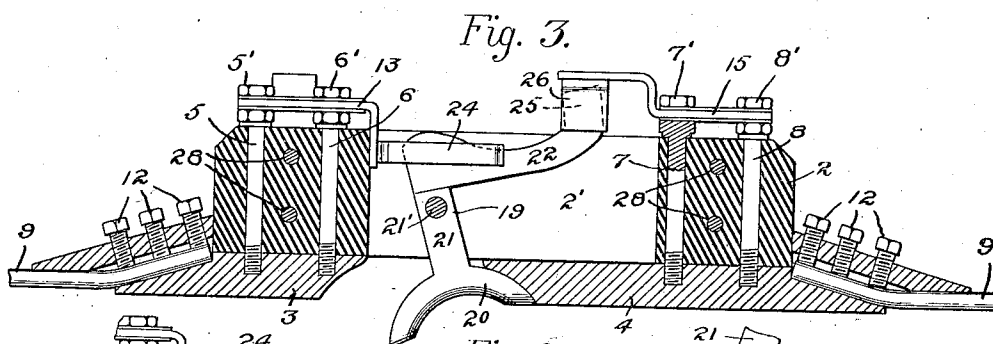
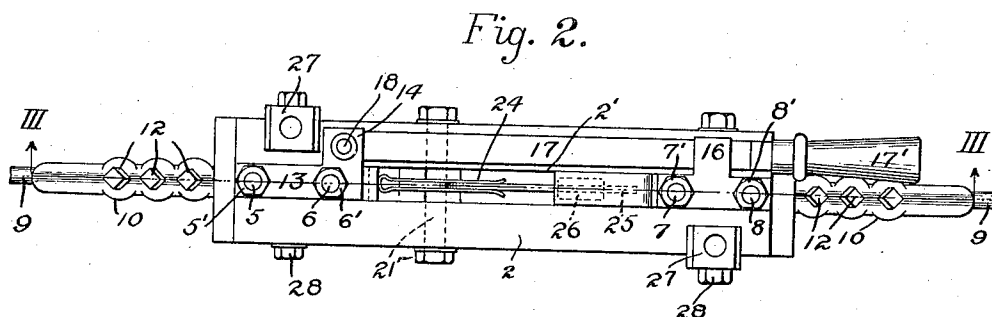
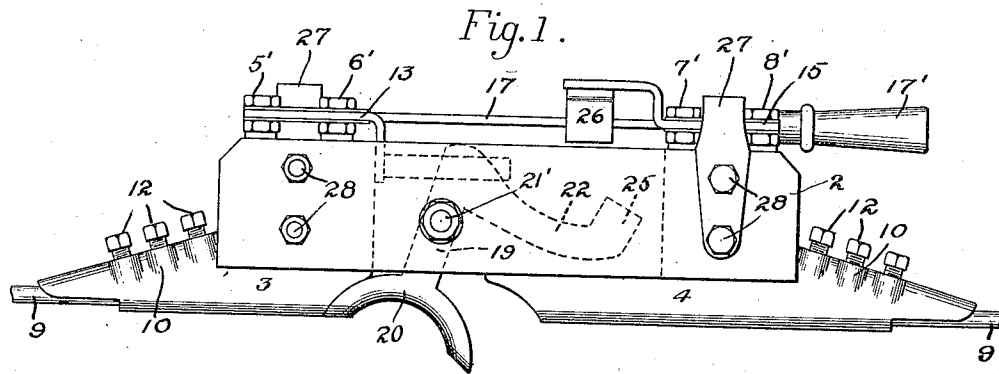


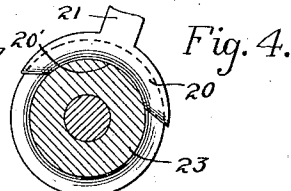
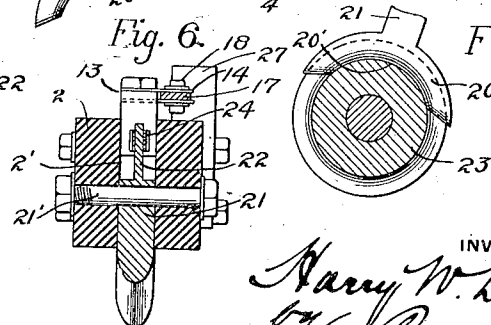
H. W. DAVIS.
SECTION SWITCH.
APPLICATION FILED JUNE 3, 1918.

1,327,463.

Patented Jan. 6, 1920.



F. N. Windridge,
J. E. Jackson.



INVENTOR
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UNITED STATES PATENT OFFICE.

HARRY W. DAVIS, OF EDGEWOOD PARK, PENNSYLVANIA.

SECTION-SWITCH.

1,327,463.

Specification of Letters Patent.

Patented Jan. 6, 1920.

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To all whom it may concern:

Be it known that I, HARRY W. DAVIS, a citizen of the United States, residing at Edgewood Park, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Section-Switches, of which the following is a specification.

My invention relates to section switches for electric trolley systems, and more particularly to automatic safety switches of the type which are especially adapted for use in mine trolley lines and are adapted to be operated by the trolley of a vehicle, and has for its principal object the provision of a device of this character that will automatically cut in or cut out an end or "plug" section of a trolley system.

Another and important object is the provision of a novel form of automatic switch member inclosed within an insulating mounting and having a head portion adapted to be firmly and positively engaged by the trolley wheel and moved on its pivot by the combined force of upward tension and forward momentum of the trolley wheel.

A further object of my invention is to provide a switch of this character having an auxiliary hand-operated switch which may be used to cut in the circuit without operating the automatic mechanism.

Other and various objects and advantages such as simplicity, durability, and the general improvement of the art will be brought out in the following specification and illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of my improved switch;

Fig. 2 is a top plan view thereof;

Fig. 3 is a sectional view on the line III, III of Fig. 2;

Fig. 4 is a detail view of the head of the automatic switch member showing a trolley wheel engaging the same;

Fig. 5 is a fragmentary view showing a modified form of automatic switch member having the terminals of its head portion formed with a more abruptly rounded face for a purpose which will be brought out fully in the following description;

Fig. 6 is a sectional view of the same on the line VI, VI of Fig. 5.

Referring more particularly to the accompanying drawings, the numeral 2 designates a block of fiber, wood, or other insu-

lating material having a centrally arranged recess for the reception of my automatic switch mechanism and having runner castings 3 and 4 secured thereto by bolts 5—6 and 7—8.

The runner castings 3 and 4 each terminate at their outer ends in holding portions for receiving and holding the ends of the trolley wire 9, and comprise an enlarged portion 10 having its upper face beveled upwardly on an angle, and having a recess therein for the end of the trolley wire extending upwardly on an angle corresponding with the angle of the upper face. Each of the portions 10 has a plurality of recesses therein for the reception of suitable set screws 12 which are adapted to be screwed down to firmly engage and hold the ends of the trolley wire.

The bolts 5—6 extend upwardly through the block 2 and pass through a hinge jaw block member 13 having a hinged jaw blade portion 14. The jaw-block 13 is held in position on the bolts 5—6 by suitable nuts 5'—6'.

The bolts 7—8 extend upwardly through the block 2 in a similar manner to the bolts 5—6 and pass through a break jaw-block member 15 having a break jaw 16, and such block is held in position on the bolts 7—8 by suitable nuts 7' and 8'.

A knife blade switch member 17 terminating at its one end in an insulating handle portion 17' is pivotally mounted in the hinge jaw blade 14 by means of pivot 18 and is adapted to have a side swing for opening or closing contact with the break jaw blade.

The location of the hand-operated switch on top of the insulating block 2 and the provision of the side swing, are decided advantages, since the switch blade and handle are protected from damage which may be caused by a trolley pole if the trolley wheel should jump from the wire, and since such switches are located so near the roof of a mine, there is little room left for the operation of a knife switch, the side swing of my knife switch therefore provides a construction that may be readily operated.

The hand-operated knife switch above described is an auxiliary switch or supplemental to the automatic switch to be described, and is to be used when it is desired to close the circuit in the trolley wire in the branch line while the automatic switch is open, and the opening or closing of such

knife switch will in no manner affect the operation of the automatic switch mechanism, other than to transmit the current from the main trolley wire through the same terminal connections as are engaged by the automatic switch.

The runner members 3 and 4 of the device are gapped or spaced apart and a switch member 19 is mounted within the recess 2' for movement in such gap. Switch member 19 comprises a head member 20, stem 21 pivotally mounted on pivot 21', and a contact blade 22. Head 20 is U or V-shaped in cross section for engagement by the groove of a trolley wheel and has convex outer contacting edge portions and a concave inner face. The concave inner face of the head 20 is of such shape and size as to form a socket 20' which will firmly and positively engage the trolley wheel 23 (as shown in Fig. 4) and hold the same. When the trolley comes into contact with the head 20 it will be positively placed and held in the socket 20' and the momentum of the vehicle to which the trolley is secured will carry the switch past the dead center of the pivot 21', at which point the upward tension of the trolley, together with the momentum of the wheel will force the switch member over and into engagement with the opposite runner member.

The stem 21 connects or joins the head 20 and contact blade 22 which extends to one side of said stem and which is adapted to have its one end in continuous contact with brush blades 24 secured to or formed integral with the hinged jaw block 13 and extending within the recess 2'. The brush blades 24 have a spring contact with the blade 22 and tend to hold such blade against displacement until the head 20 is engaged by the trolley wheel 23. The other end of the blade 22 is curved or turned upwardly forming a portion 25 adapted to engage a spring contact socket 26 formed integral with or secured to the break jaw block 15.

The portion 25 and socket 26 form an auxiliary contact connection which will complete the circuit before the head 20 contacts with the portion 4 of the runner and which will break the circuit after the head has been disengaged from the runner 4 in reverse movement but before it engages the runner 3. The blade 22 which extends to the one side of the stem 21 has its contact portion 25 positioned at a greater distance from the point 21' than head 20 and therefore will make a greater arc when the switch is operated than the head 20, and consequently cause a quick make or break with the socket 26, thus reducing the tendency of the current to arc or flash at this point. It will also be readily understood by those skilled in the art that I have provided a switch that will eliminate arcing or flashing at the

point of contact of the head 20 and runners 3 and 4, since such runners will be in the same electrical condition as the head at the time of making or breaking of the circuit.

If at any time the brush 24 or socket 26 should become worn or broken, they may be removed and replaced by simply removing the nuts 5'-6' and 7'-8' respectively and removing the blocks 13 and 15 to which they are attached without removing the switch from position.

Suitable hanger lugs 27 are secured to the block 2 by bolts 28 which preferably pass completely through the block and serve to reinforce the same. While I have shown only two of the hanger lugs 27, it will be understood that any other number may be used if desired.

In Fig. 5 I have shown a slightly modified form of head member for the switch 19, such head being designated by the numeral 20^a. The head 20^a has its one terminal nearest the main line curved in a more complete curve forming a more abrupt surface, so that if it should be desired to run a second vehicle into the branch while the first was still in, and the switch was swung over to complete the circuit in such branch, the trolley of such second vehicle will strike the convex surface of the head 20^a and due to its more abrupt shape, be guided around the same and over such switch without jumping.

The operation of the device will be readily understood by those skilled in the art from the above description. However, I wish to draw particular attention to the general simplicity of the device and its minimum number of parts, its non-sparking qualities, its automatic operation by means of the trolley without any auxiliary springs, etc., and the novel combination of automatic switch with the independently hand-operated auxiliary knife switch.

While I have shown and described in particular one preferred form of my invention, it will be understood that various changes in design and details of construction may be made by those skilled in the art without departing from the spirit of my invention as defined in the appended claims.

What I claim is:

1. A switch for trolley conductors comprising an insulating block having an aperture therein, runner members secured on the end portions of said block and having their inner terminals spaced apart, and a pivoted switch member adapted to close the contact between said runner members having an abruptly concaved terminal for snugly engaging a trolley wheel and providing a positively engaging lever connection therewith.

2. A switch for trolley conductors comprising an insulating block having an aperture therein, runner members secured on the

end portions of said block and having their inner terminals spaced apart, and a pivoted switch member mounted for movement between said spaced terminals of said runner members and having a blade adapted to close the circuit between said members, said switch member having a receiving socket conforming to the periphery of and adapted to be operated by the trolley wheel of a vehicle, and provided with terminals adapted to engage each runner member alternately.

3. A switch for trolley conductors comprising an insulating block having an aperture therein, runner members secured on the end portions of said block and having their inner terminals spaced apart, a pivoted switch member mounted for movement between said spaced terminals of said runner members and having a blade adapted to close the circuit between such members, said switch member having a head portion V-shaped in cross section and having its under surface cut away to form a concave socket conforming to the curvature of and adapted for the reception of a trolley wheel, providing a continuation of one of the runner members by one of its terminals and a downwardly extending lever abutment by the other.

4. A switch comprising a block of insulating material having a centrally arranged recess, runner members secured to the end portions of said block and having their inner terminals spaced apart, and an automatic switch member pivotally mounted in said aperture and adapted to close the circuit between said runner members, said switch member comprising a head member, a stem and a blade, said switch member having a receiving socket adapted to be engaged and operated by the trolley wheel of a vehicle and said blade portion being adapted to be thrust through a sufficiently long arc to close the circuit between the terminals of said runner members before said head member contacts therewith.

5. A switch comprising a block of insulating material having a centrally arranged recess, runner members secured to the end portions of said block and having their inner terminals spaced apart, and an automatic switch member pivotally mounted within said aperture and adapted to close the circuit between said runner members, said switch member comprising a head portion, a stem, and a blade, said head portion being V-shaped in cross section and having its under surface cut away forming a concave socket for the reception of a trolley wheel and to provide by either terminal a down-

wardly extending shifting lever and adapted to be operated by the trolley wheel of a vehicle, and said blade portion being adapted to be thrust through a sufficiently long arc to close the circuit between said runner members before said head member contacts therewith.

6. A switching device comprising a block of insulating material having a centrally arranged aperture, runner members secured to the under face of said block and having their inner terminals spaced apart, contact members arranged on the upper face of said block and in circuit with said runner members, a switch member pivotally mounted within said aperture, said switch member comprising a head portion, a stem, and a blade, said blade having a brush engagement with one of said contacts, and being adapted to engage the other of said contacts to close or open the circuit between said runners by rotation around its pivot, said head portion being abruptly concaved to conform to the curvature of and adapted to be engaged by the trolley wheel of a passing vehicle to operate the same and being adapted to contact by one of its ends with one of the runners after the circuit has been closed by said blade portion.

7. A switch for trolley wheel conductors comprising an insulating base, runner members secured on the end portions of said base and having their inner terminals spaced apart and provided with concaved contact faces, and a pivoted switch member adapted to close the contact between said runner members having a swinging head portion abruptly concaved to form a socket adapted to engage and temporarily hold the trolley wheel of a vehicle and provided with oppositely extending lever-providing contact arms rounded on their upper edges to engage the concave contact faces of the runner members.

8. The combination with a switch of the class described comprising an insulating base having at its lower end portions spaced runner members and upper contact members in circuit therewith and an intervening pivoted contact member therefor provided with a trolley-wheel-engaging socket adapted to be positively thrust in one direction or the other by a trolley wheel, of an auxiliary hand lever and blade pivotally mounted above the insulating base by its end to one of said upper contact members and adapted to engage with or disengage from the other of said contact members.

In testimony whereof I hereunto affix my signature.

HARRY W. DAVIS.