No. 607,638. Patented July 19, 1898.

A. B. DU PONT.

ELECTRIC LINE SWITCH.

(Application filed Aug. 12, 1897.)

(No Model.)

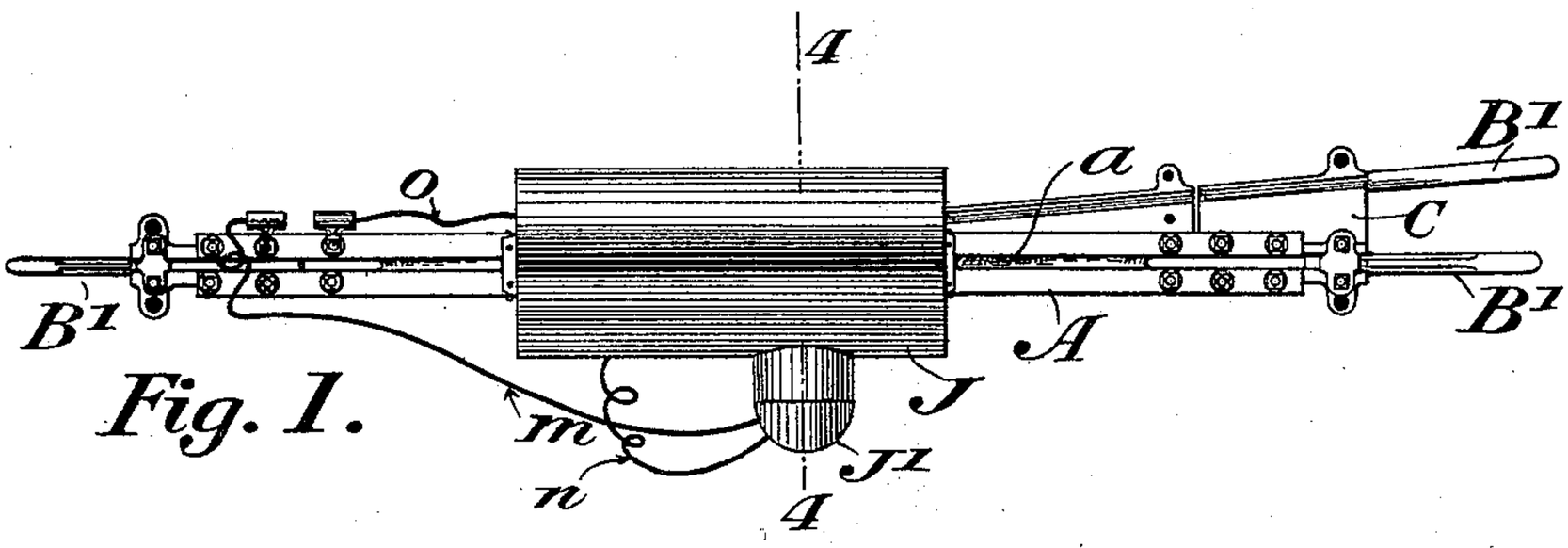

Fig. 1.

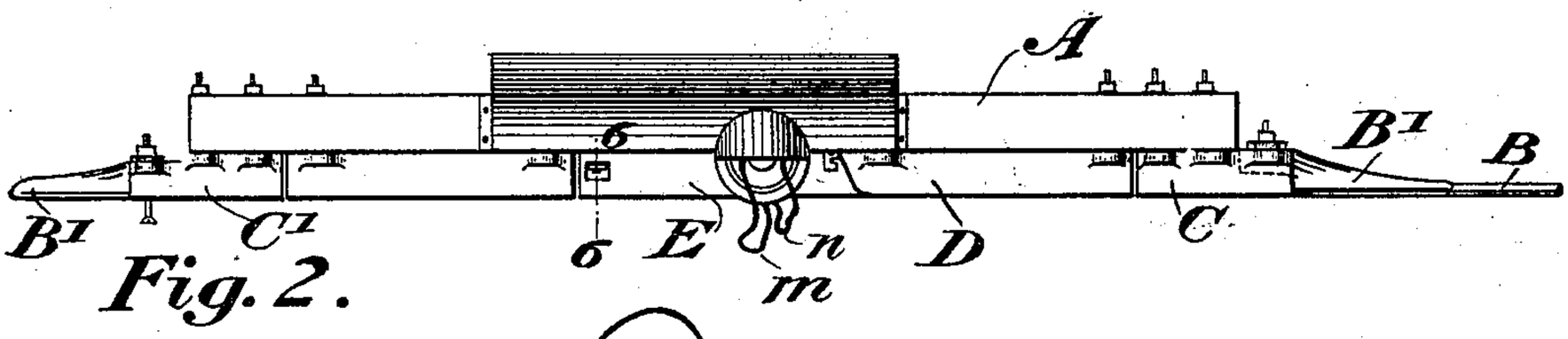

Fig. 2.

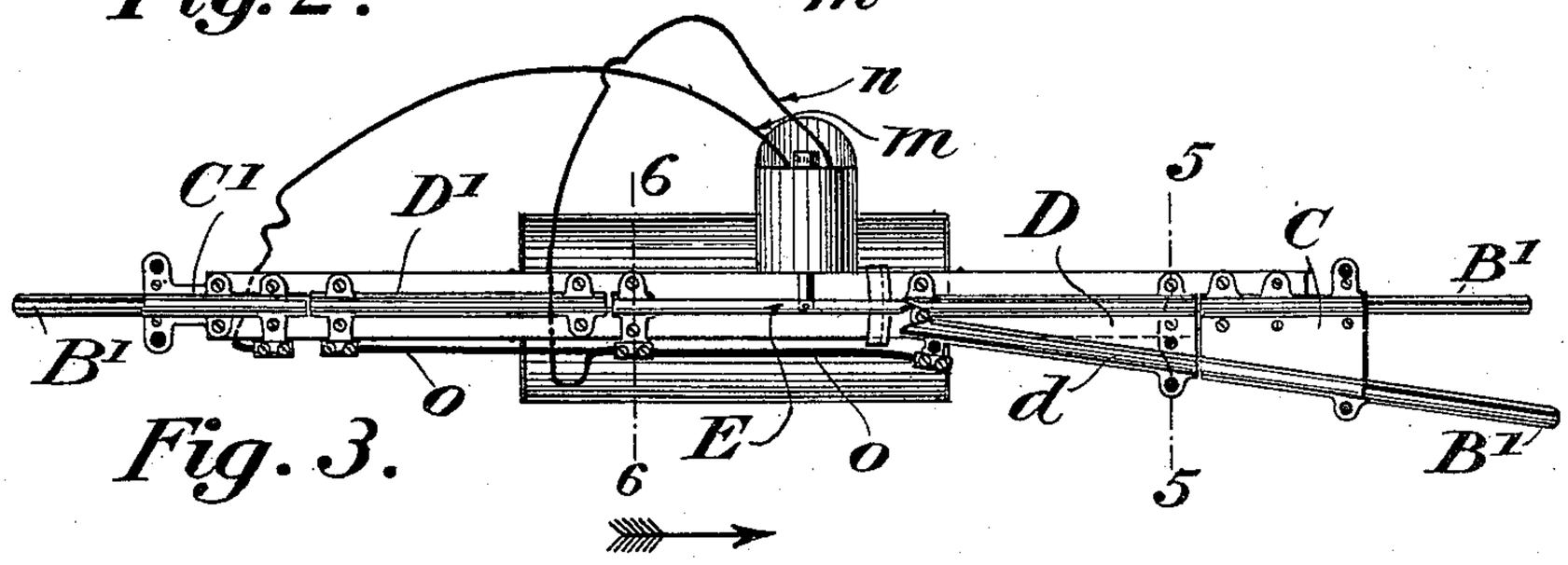

Fig. 3.

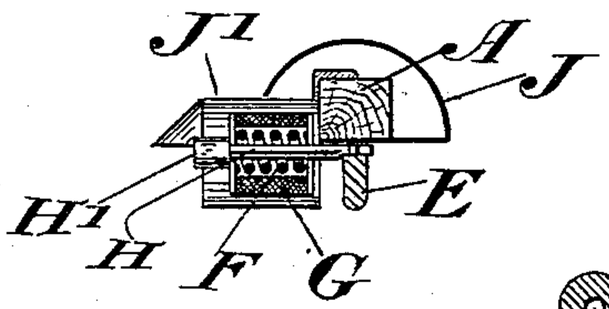

Fig. 4.

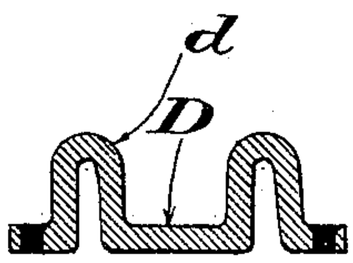

Fig. 5.

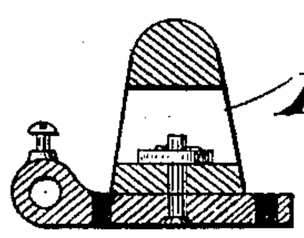

Fig. 6.

WITNESSES:

H. C. Stitt.

C. F. Kress, Jr.

INVENTOR

A. B. du Pont

BY

Richard Eyre

ATTORNEY.

UNITED STATES PATENT OFFICE.

ANTOINE B. DU PONT, OF DETROIT, MICHIGAN, ASSIGNOR TO THE STEEL MOTOR COMPANY, OF JOHNSTOWN, PENNSYLVANIA.

ELECTRIC-LINE SWITCH.

SPECIFICATION forming part of Letters Patent No. 607,638, dated July 19, 1898.

Application filed August 12, 1897. Serial No. 647,982. (No model.)

To all whom it may concern:

Be it known that I, ANTOINE B. DU PONT, of Detroit, Wayne county, Michigan, have invented certain new and useful Improvements in Electric-Line Switches, of which the following is a specification.

My invention relates to switches for electric-railway suspended conductors; and it is the object of my invention to provide a durable and efficient switch the position of which is under the control of the operator, which is so arranged that the trolley-wheel may pass through the switch at a high rate of speed without danger of losing engagement therewith, and it will be so constructed that the groove of the trolley-wheel will at all times act as the contact portion thereof.

A further object of my invention is to provide a switch which may be set at any desired position in advance of the point at which the branch conductor diverges from the main conductor.

I attain these objects by providing a switch having a tongue which is normally held by a spring in position to continue the trolley-wheel on the straight track, and to move the tongue for transferring the trolley-wheel to the branch conductor I provide a magnet which is energized by the current passing from the trolley-wire through an energizing-coil, thence through an insulated section of the switch to the car-motors.

My invention further consists in the improved construction, arrangement, and combination of parts, which will be hereinafter described.

Referring to the drawings, Figures 1, 2, and 3 are respectively plan, side, and inverted plan views of a switch embodying the features of my invention. Figs. 4, 5, and 6 are sections on the lines 4 4, 5 5, and 6 6, respectively.

The conductor B, which is shown only in Fig. 2, enters the end section B′ B′ of the switch and thence passes through a groove *a* in the top of a continuous insulating-block A, preferably of wood, while under the end sections B′ B′ the trolley-wheel rides on the under side of the conductor B.

C and C′ and D and D′ are preferably brass castings of substantially the shapes indicated, which are secured to the under side of the block A.

When the trolley-wheel passes from B′ to C or to C′, it leaves the conductor B and rides directly on the rib or ribs of the castings.

E is the tongue of the switch and as shown in Fig. 3 is set for the straight track. If, therefore, a trolley-wheel enters the switch and travels in the direction of the arrow, it will have a continuous passage without change of level from C′ to D′, to E′, to D, to C.

F is a compression-spring which tends to draw the tongue E over toward the coil B. This tongue is connected by a brass rod H to an iron armature H′, so that when the coil G is energized it will act as a solenoid and draw the armature inward, pushing the tongue E toward the rib *d* of the casting D.

J is a sheet-metal roof which protects the underlying parts from rain, &c. J′ is a similar roof for the protection of the magnet-coil.

I have found in practice that the mechanical construction of this switch, as above described, is strong and reliable while simple and compact. The connection between the solenoid and the free end of the tongue is particularly advantageous in that it acts upon the tongue through considerable leverage, a solenoid-magnet being better adapted for a long pull than for a strong pull.

Sections D and D′ are insulated by an air-space from the sections C and C′. One end *m* of the magnet-coil is connected to the section C′, which is in direct connection with the conductor B. The other end *n* of the magnet-coil is connected to the tongue E, which is in turn connected by the wires O to sections B and B′.

If now the motorman desires to keep to the straight track, no matter which direction he may be going, he has only to be careful that he take no current to his motors while the trolley-wheel is on sections D, E, and D′. If he wants to switch from the main track to the branching track, or vice versa, he must, on the contrary, arrange to have current passing through the motors while his trolley-wheel is on the said sections. If he does this, the path of the current will be from the trolley B to the section C′, through wire *m*, through the coil G, through the wire *n* (possibly also

through the wire *o*) to the insulated sections, thence through the motors. In this way he energizes the magnet and for a moment sets the tongue E over against the rib *d*. The end of the tongue E and both ribs of the section D are tapered, so that the latter may act as stops for the movement of the tongue.

With the switch which I have described the car may travel under it at a high rate of speed, and from the nature of the switch the contacting section may be placed at any position desired—as, for example, half a block ahead of the switch in case some special condition makes this desirable. In practice, however, it is better to place this switch at such a position that the trolley-wheel is at or about the section C′ just after the car upon which it is carried has taken the curve for the branching track. By placing the switch in this position less is left to the memory of the motorman, as at this place it is the usual practice to have current passing to the motors if the car is to pass to the branch track, while it is easy for the motorman to remember that the switch should be passed with the controller "off" if it is his intention to keep to the straight track.

I desire to be understood as not limiting myself to the specific details which I have shown and described, as modifications which are within the scope of my invention will readily suggest themselves to others skilled in the art.

Having thus described my invention, what I claim, and desire to protect by Letters Patent, is—

1. A switch for suspended electric conductors comprising the combination of a continuous insulating member secured to and suspended from the main conductor, metal sections depending from the said insulating member and disconnected electrically from the main conductor, a movable tongue between said depending sections, and a magnet for actuating said tongue having a coil whose terminals are in connection with the main conductor and with the ribbed sections.

2. A switch for electric conductors comprising the combination of a tongue, ribbed sections at each end of the tongue insulated from the main conductor, a spring for holding the tongue in one of its operative positions, a solenoid-coil having its terminals connected respectively to the main conductor and to the ribbed sections and an armature connected to the said tongue and actuated by the current in the said coil.

3. In a switch for electric conductors the combination of the insulating member A, the main conductor B, the ribbed sections D and D′ depending from said insulating member and disconnected from said conductor, the pivoted tongue E, the magnet for operating said tongue, and the roof J.

4. In a switch for electric conductors, the combination of a pivoted tongue, a magnet and spring for controlling the position of the tongue, a ribbed section, connected through the magnet-coil with the main conductor, at each end of the tongue, and roofs protecting the tongue, ribbed sections and magnet.

5. In a switch for suspended electric conductors, in combination, a continuous suspended insulating member, depending ribbed sections and a pivoted tongue secured thereto, a solenoid also secured to said insulating member, and having a spring-pressed armature connected directly to the tongue near its free end, and sheet-metal roofs J and J′ also secured to said insulating member and protecting the tongue and magnet.

In testimony whereof I have affixed my signature in presence of two witnesses.

ANTOINE B. DU PONT.

Witnesses:

GEORGE C. WALDO,

CLAUDE B. KING.