No. 746,463. PATENTED DEC. 8, 1903.

C. M. CLARK.

ELECTRIC CONDUCTOR.

APPLICATION FILED DEC. 10, 1902

NO MODEL. 2 SHEETS—SHEET 1.

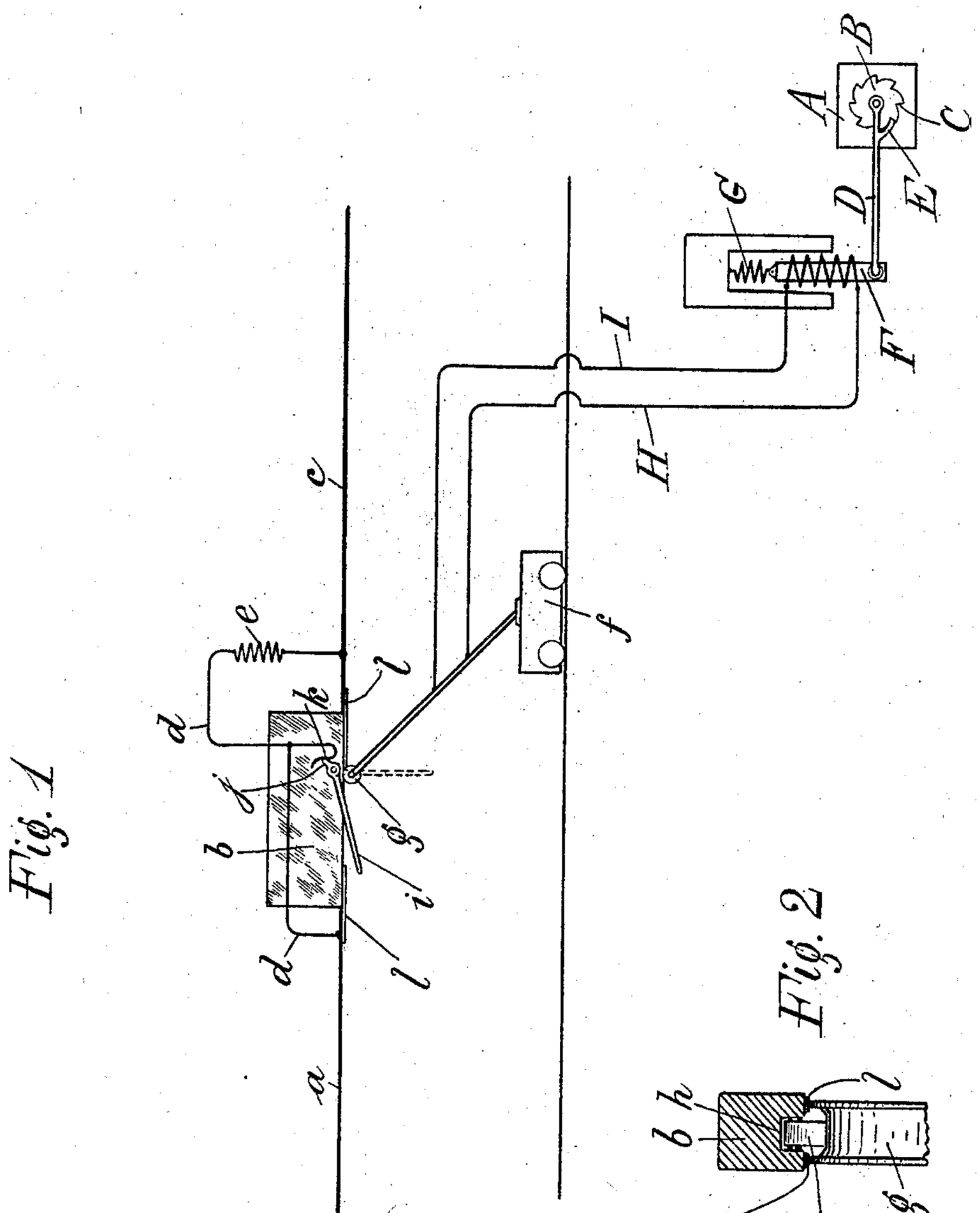

Fig. 1

Fig. 2

Witnesses
John L. Ramsey
Helen M. Parsons

Inventor
Charles M. Clark
By his Attorneys
Benjamin Reynolds & Stanton

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NO MODEL. 2 SHEETS—SHEET 2.

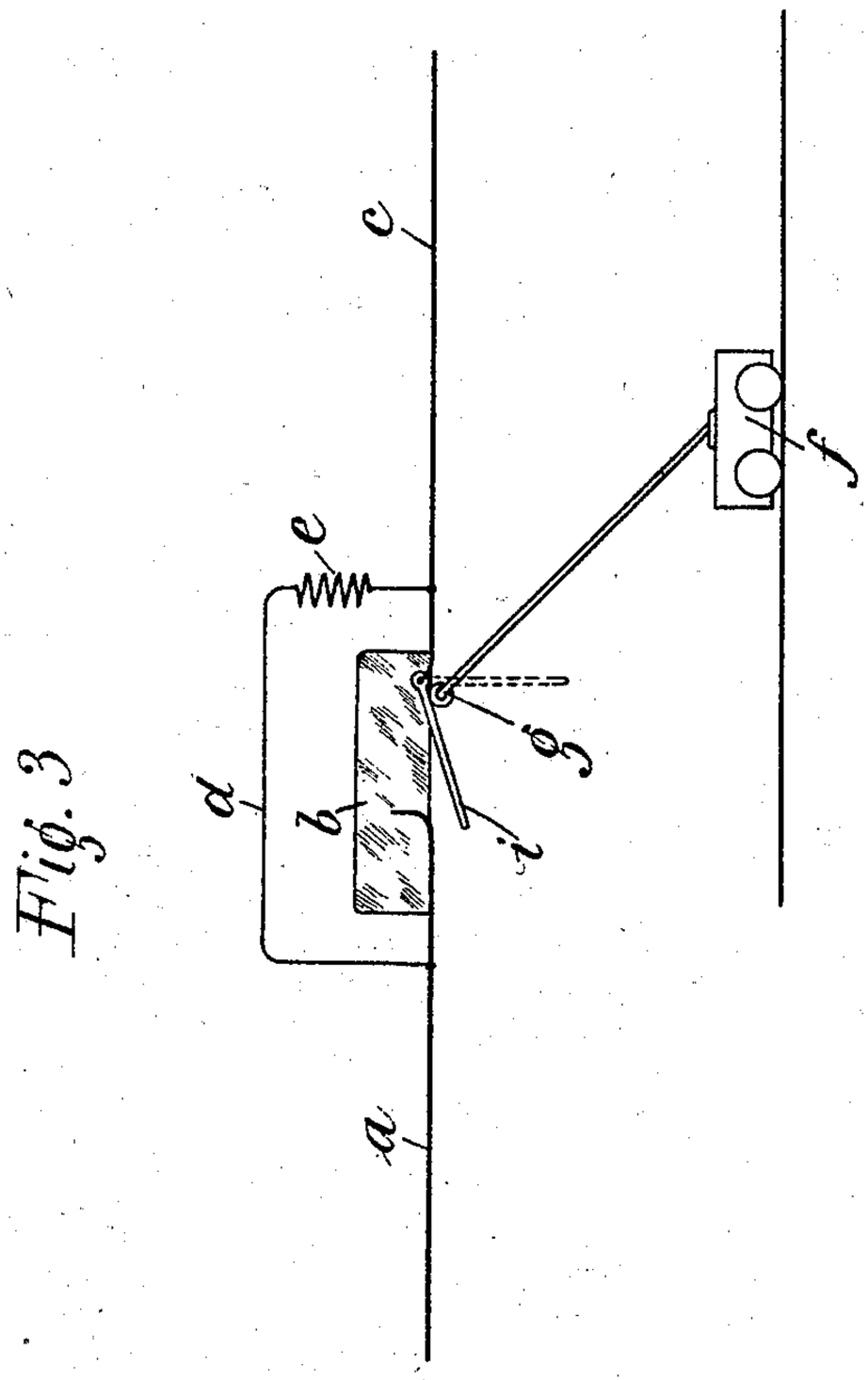

Fig. 3

Fig. 4

Witnesses
John L. Kanagan
Herman Bruns

Inventor
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No. 746,463. Patented December 8, 1903.

UNITED STATES PATENT OFFICE.

CHARLES M. CLARK, OF SOUTH ORANGE, NEW JERSEY.

ELECTRIC CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 746,463, dated December 8, 1903.

Application filed December 10, 1902. Serial No. 134,603. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. CLARK, a citizen of the United States, and a resident of South Orange, New Jersey, have invented certain new and useful Improvements in Electric Conductors, of which the following is a specification.

My invention relates to main conductors for electric lines in which dead sections or sections having reduced currents are employed for stopping the motor at predetermined points.

In the drawings forming part of this specification, Figure 1 represents diagrammatically a form of insulating-block embodying my invention. Fig. 2 is an end view of said block. Fig. 3 is a view showing a block of different form. Fig. 4 is a section showing the shape of the swinging lever on the block.

Though my invention may be used in any system of electric propulsion, I will describe it as used with telpherage systems. In many of these sytems the motor stops at predetermined points, is automatically reversed, and at the same time the load is automatically discharged and the telpher returns automatically to the starting-place.

The object of my invention is to provide means whereby I may use with such a system of telpherage a rotary switch which will be operated to reverse the motor by the breaking of the circuit through the same without causing such reversal when the trolley passes over the insulating-blocks forming the dead sections on the line.

In Fig. 1 I have illustrated diagrammatically such a form of switch. A represents the switch, which is of a well-known type, on the spindle of which is a ratchet-wheel B, having teeth C. Freely movable on the spindle is a ratchet-lever D, carrying a pawl E. It will be observed that when the ratchet-lever is raised the pawl will pass freely over the teeth, and when the ratchet-lever is depressed the switch will be moved a part of a revolution, thus reversing the motor. I operate this lever by means of a solenoid, the core F of which is attached to the ratchet-lever D. Between the core and the end of the solenoid is a spring G, normally tending to depress the core. The solenoid is energized through wires H I, passing from the trolley-pole. It will be seen, therefore, that when the current is passing through the motor the solenoid will be energized, raising the core and the ratchet-lever D, but not moving the switch. When, however, the circuit is broken, the solenoid becomes deënergized and the spring G forces the core F and the ratchet-lever D downward, turning the switch a portion of a revolution.

In order to make my invention more clear, I will describe briefly the operation of a motor traveling along the line.

Referring particularly to Fig. 1, *a* represents the main conductor. In this main conductor is introduced an insulating-block *b*, thus dividing the line into two sections, the second one, *c*, of which is supplied with current through a by-pass *d*, provided with a resistance *e*, so regulated that a considerably-reduced current flows through the section *c*. *f* represents the telpher, and *g* the trolley therefor. Supposing the telpher to start from the left of the line looking at Fig. 1, it will travel along until the trolley strikes the insulating-block *b*, whereupon, as heretofore described, the circuit being broken through the motor, the switch will reverse; but the momentum of the motor will carry it past the block and on to the line *c*, where it will stop, there being a reduced current on said line, the current passing through the reversed motor causing it to act as a brake. Here the telpher automatically discharges its load and the motor immediately proceeds to move backward. When the trolley again strikes the insulating-block, the motor will, unless means be provided to prevent it, again be reversed, for the current through said motor while on the section *c* has energized the solenoid and lifted the ratchet-arm D. To prevent this reversing of the motor at this point is the object of my invention. Referring to Figs. 1 and 2, the block *b* has in the bottom thereof a groove *h*, between the sides of which is freely pivoted a lever *i*, which normally hangs in a vertical position, as indicated in dotted lines. This lever is provided with a projection *j*, which when the lever is swung to the left will engage with a spring contact-piece *k*, which is in electrical connection with the by-pass *d*. The under side of the block on each side of the groove is provided with

metallic pieces *l*, which are in electrical connection with the sections *a* and *c*, respectively, but which run only a part of the length of the block. The groove *h* is of such a depth as to allow the lever to swing up so that the trolley can pass freely under it in either direction. When the trolley passes from left to right looking at Fig. 1, it passes on to the block *b*, and after it has left the metallic piece *l* no current can pass through the motor, and the switch will be reversed, as heretofore described. The trolley passing along by its own momentum will swing the lever *i* to the right and pass on to the section *c* of the line, where the motor will stop, as heretofore described. When the motor starts back after its load is discharged, the trolley strikes the lever *i* before it leaves the metallic piece *l* and moves said lever so that the projection *j* is in engagement with a contact *k*, thus maintaining the circuit through the motor. As the telpher continues its travel it will move along under the lever *i* and on to the metallic piece *l* and thence to the main line *a*. The lever *i* is of such a length that the trolley is in engagement with the section *l* before its contact with the lever *i* is broken. This, as will be readily seen, effectually prevents the reversal of the motor when passing the insulation-block on the return trip of the telpher. Instead of using the contact-piece *k* I may connect the lever directly to the by-pass.

In Figs. 2 and 3 I have shown a different form of the invention. In this case the lever is freely pivoted, as in the first instance. It is connected directly to the section *c* of the line. The wire of the section *a* of the line runs along underneath the block, as clearly shown. The lever *i'* is of such a length that when the trolley passes from right to left it bridges the space between the extensions of the lines *c* and *a*. The lever is grooved on its under side or its side next to section *c* in order that when the telpher travels toward the right it may move up in contact with the wire, so as to prevent any breaking of the circuit when the trolley is passing from *i'* to *c*. The operation of the device is precisely the same as heretofore described in connection with Figs. 1 and 2.

It will be observed that this invention may be used with the section *c* as a dead section and energized only when it is desired to start the telpher back, for in such case the motor would be automatically reversed when its trolley reached the dead section, and when said section was energized and the motor started back the current would be maintained until the trolley struck the main conductor, as heretofore described.

What I claim, and desire to secure by Letters Patent, is—

1. An insulating device for electric conductors having means for breaking the circuit through the motor when it passes in one direction and means for maintaining the circuit when passing in the other direction, substantially as described.

2. An insulating-block for conductors having a freely-pivoted lever attached thereto and electrical connections whereby movement of the lever in a given direction will maintain the circuit through the motor, substantially as described.

3. An insulating-block, a freely-pivoted lever attached thereto, a contact-point in electrical connection with the line, and a projection on the lever adapted to engage said contact-point when the lever is swung in a given direction, substantially as described.

In witness whereof I have hereunto set my hand, in the city, county, and State of New York, this 4th day of December, 1902.

CHARLES M. CLARK.

In presence of—
E. M. HARRISON,
JOHN J. RANAGAN.