

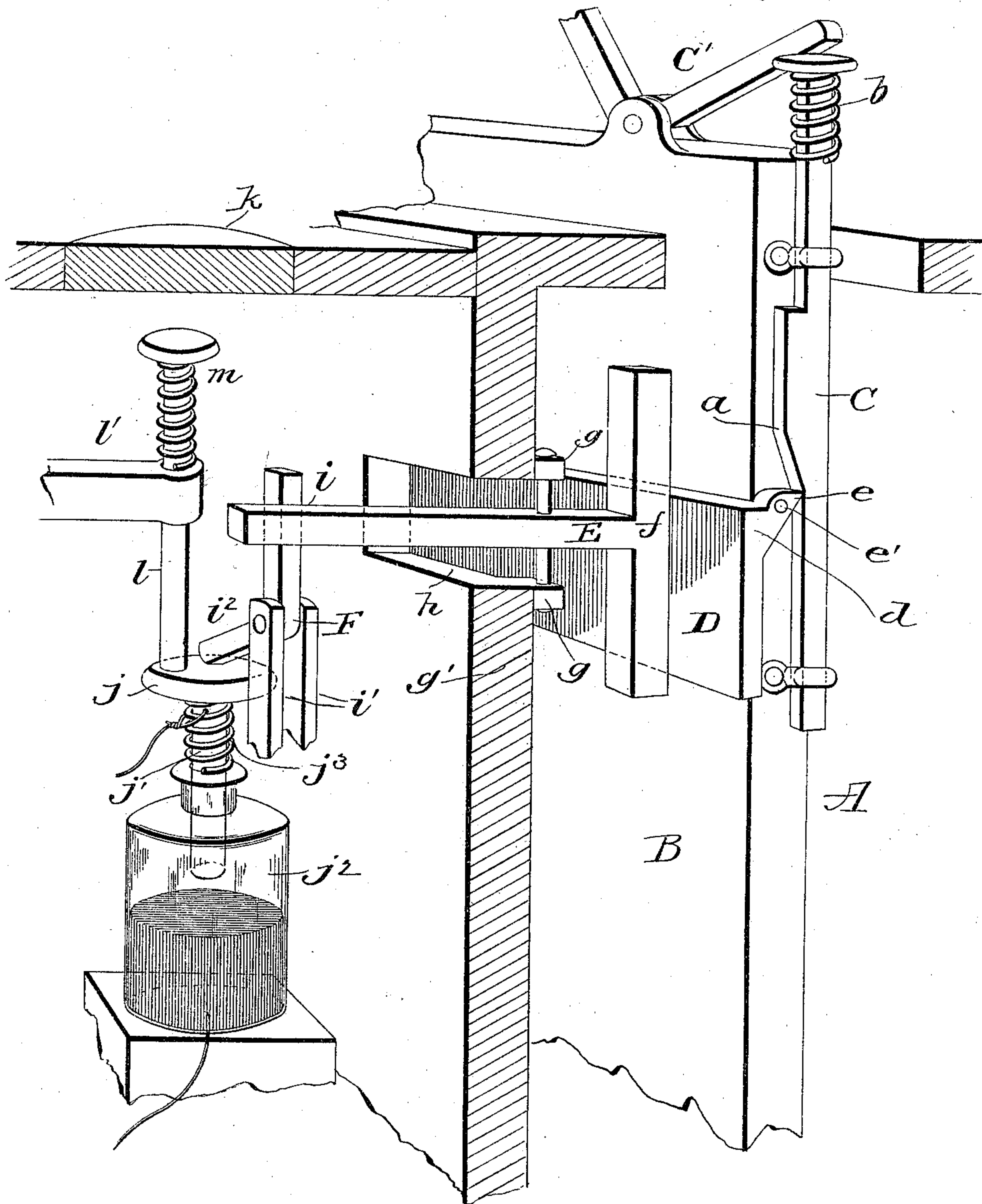
(No Model.)

3 Sheets—Sheet 1.

W. M. WOOD & J. C. MILLER.  
CABLE RAILWAY.

No. 542,670.

Patented July 16, 1895.



Witnesses  
E. Nottingham  
G. F. Downing

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Attorney

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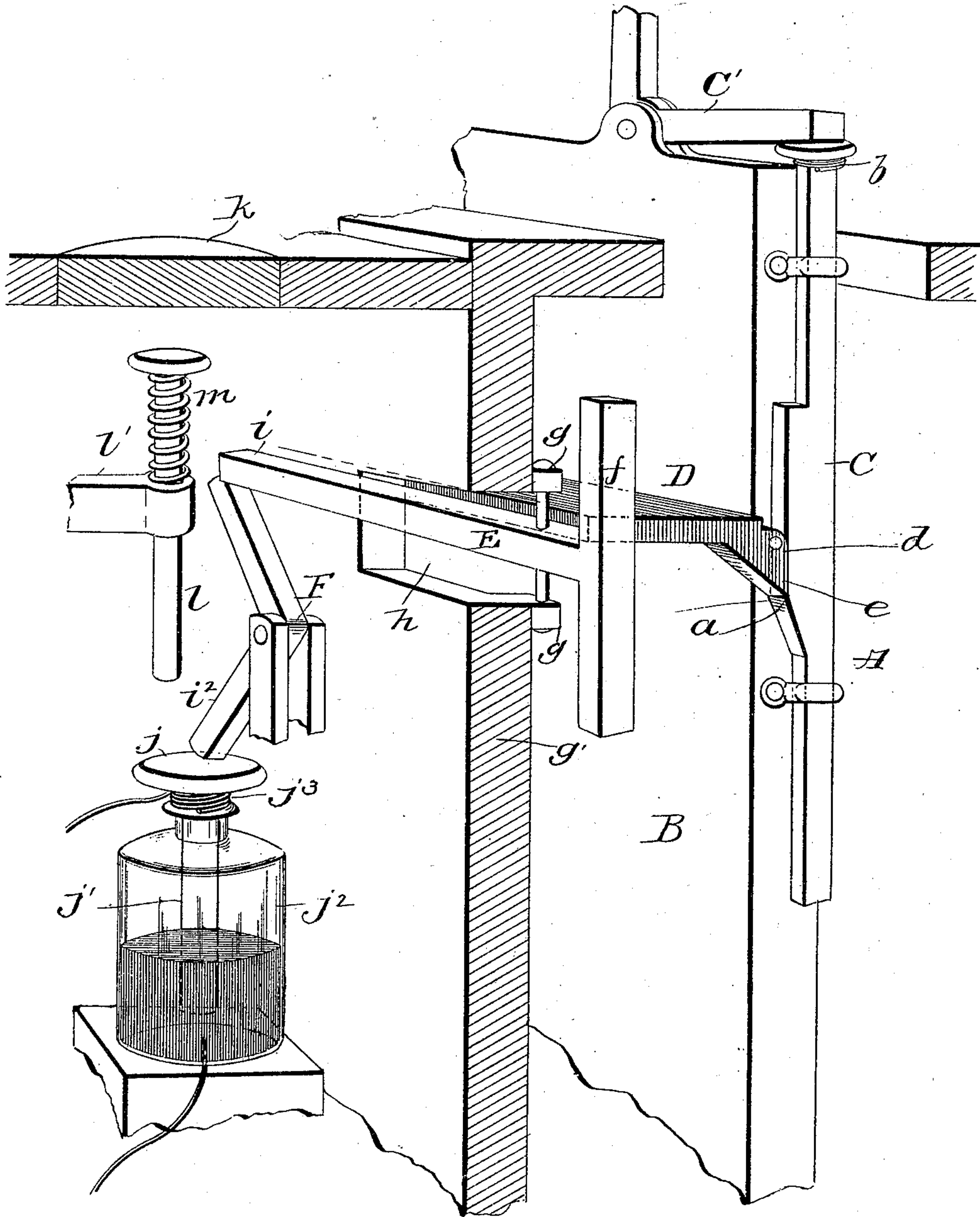


FIG. 2.

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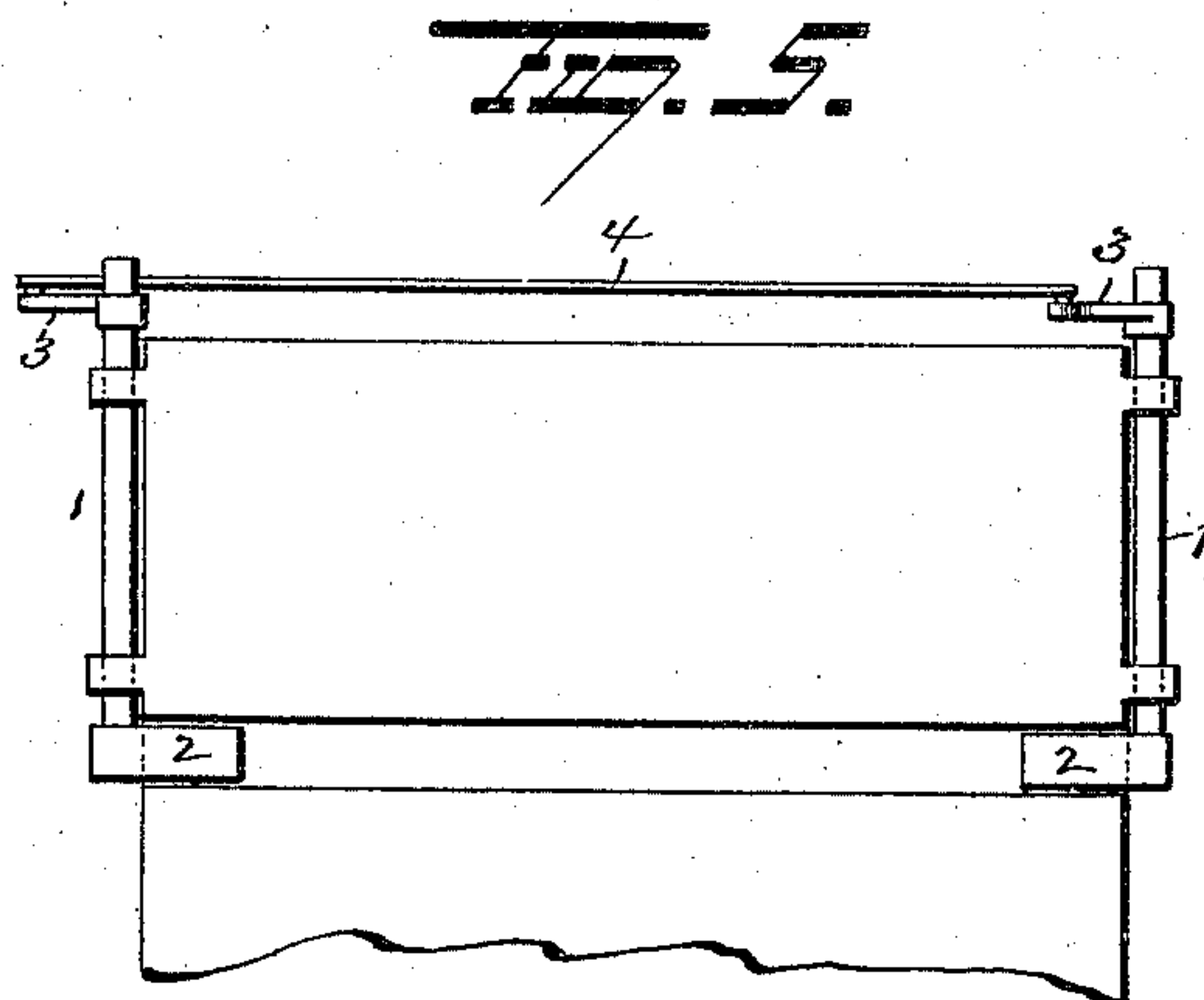
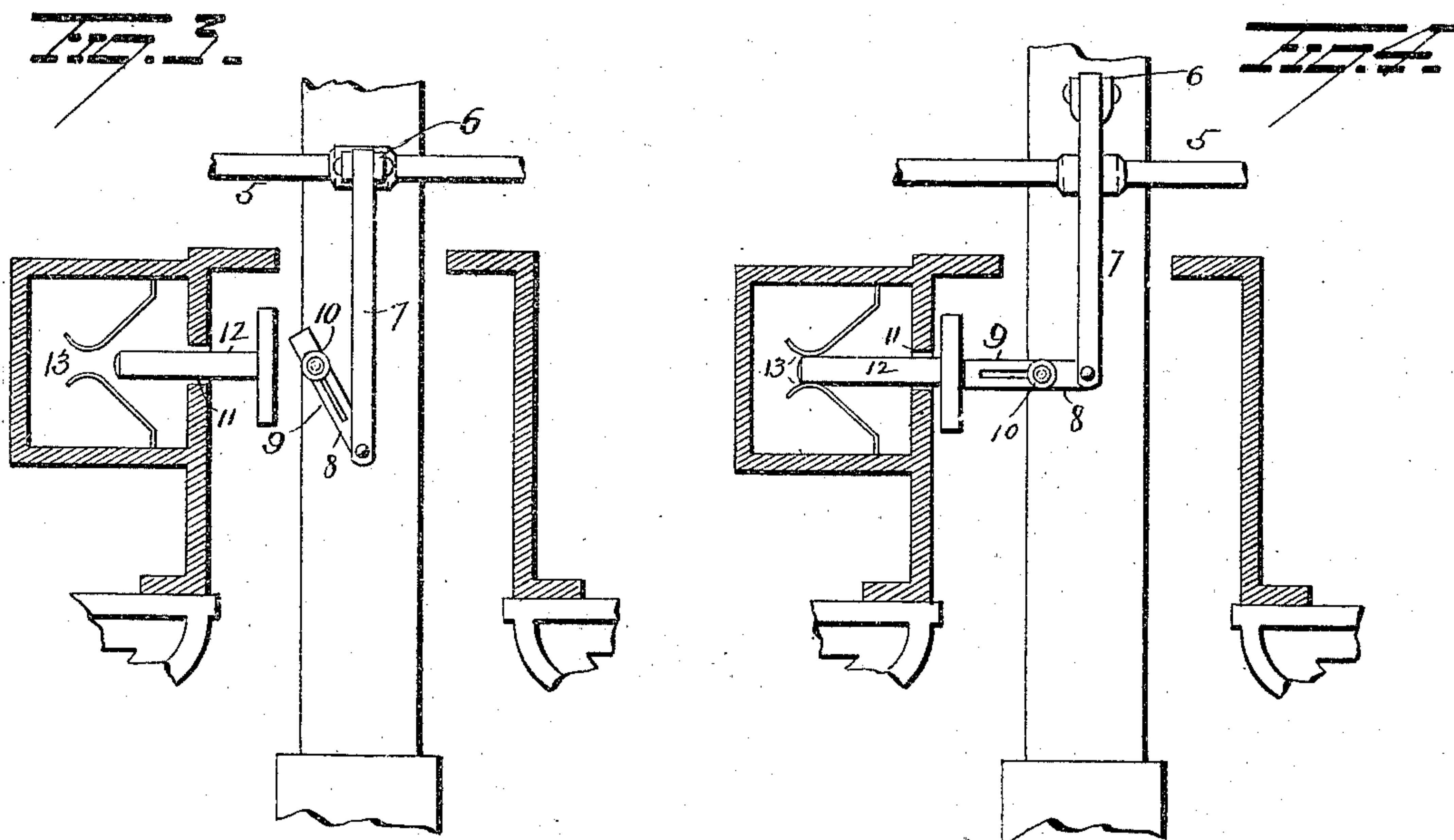
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# UNITED STATES PATENT OFFICE.

WILLIAM M. WOOD AND JAMES C. MILLER, OF ELMIRA, NEW YORK, ASSIGNORS OF ONE-THIRD TO CHARLES F. WRIGHT, OF SUSQUEHANNA, PENNSYLVANIA.

## CABLE RAILWAY.

SPECIFICATION forming part of Letters Patent No. 542,670, dated July 16, 1895.

Application filed May 29, 1894. Serial No. 512,907. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM M. WOOD and JAMES C. MILLER, of Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Cable Railways; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to an improvement in cable railways, the object of the invention being to produce simple and effectual means whereby the cable can be stopped in case of accident or for other reason by the manipulation of devices carried by the car, regardless of the location of the car relatively to the power-house.

A further object is to provide means by which the machinery which drives the cable of a cable road can be stopped by the manipulation of simple and efficient devices carried by the car.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view illustrating our improvements, showing the normal positions of the various parts. Fig. 2 is a view showing the positions which the devices will assume when they are manipulated. Figs. 3, 4, and 5 are views of modifications.

A represents a conduit such as usually employed for the accommodation of a cable and grip device, and in said conduit our improvements are illustrated.

B represents a grip of any preferred form of construction and may be connected with a car in any suitable manner. To one end of the grip B a vertically-movable rod or bar C is connected and made with a cam or shoulder *a*. The rod or bar C is maintained at the upper end of its movement by means of a spring *b*, and said rod or bar is adapted to be depressed for a purpose presently explained by means of a bell-crank lever *C'*, pivotally con-

nected to the top of the grip, and said bell-crank lever can be turned on its fulcrum by means of any suitable device carried by the car on the platform thereof.

A comparatively light plate D is normally disposed parallel with one face of the grip B and provided with lugs *d* adapted to lie parallel with the ends of the grip and by means of which the plate is pivotally connected to the ends of the grip, one of said lugs being made with a shoulder *e* to be engaged by the shoulder *a* of the rod or bar C when the latter is depressed, whereby to cause said plate D to turn on its pivots *e'* and assume a horizontal position, as shown in Fig. 2. When the plate D is thus made to move from its position parallel with the grip to a position at right angles thereto, it will engage the T-shaped end *f* of a lever E, pivotally supported between its ends to lugs *g* projecting from the conduit-frame *g'* and projecting through a slot *h* in said conduit-frame. The outer end *i* of the lever E is adapted to engage a bell-crank lever F, pivotally supported in suitable standards *i'*, and the arm *i<sup>2</sup>* of said bell-crank lever is adapted to engage a button *j* at the upper end of a plunger or contact rod *j'*, the latter being adapted to be made to project into mercury in a vessel *j<sup>2</sup>* to close or open an electrical circuit through any suitable mechanism located at the power-house for stopping the machinery which operates the cable. This stop mechanism may be made to operate a clutch whereby to stop the transmission of power to the cable.

From the construction and arrangement of parts above described it will be seen that when the bell-crank lever *C'* is operated, as above described, the vertically-movable rod C will be depressed, the plate D moved outwardly and caused to turn the T-shaped lever E on its fulcrum, and the latter will engage the bell-crank lever F and cause it to turn on its fulcrum and force the plunger *j'* into contact with the mercury in the vessel *j<sup>2</sup>*, against the resistance of a light spring *j<sup>3</sup>*, thus closing an electrical circuit through stop mechanism located at the power-house, whereby to stop the motive power to the cable, as above explained.



The plate D will extend the full length of the grip, and the devices above described for closing the circuit through the stop mechanism will be located at suitable intervals throughout the length of the road.

The devices above described are exceedingly simple in construction, sure in operation, and effectual in all respects in the performance of their functions.

10 If it be desired to open instead of close an electrical circuit for the purposes above described, this may be easily done by simply reversing the position of the T-shaped lever E, whereby to cause it to raise the plunger  $j'$  out  
15 of contact with the mercury in the jar or vessel  $j^2$ , instead of depressing said plunger in order to make side contact, as above described.

To the side of the usual slot through which the grip-arm passes we prefer to make hand-  
20 holes  $k$ , each provided with a suitable cover, one of such hand-holes being located over each circuit-closer. Below each hand-hole a vertically-movable rod  $l$  is supported in a suitable bracket  $l'$  and maintained normally at  
25 the upper end of its movement by means of a spring  $m$ , the lower end of said rod terminating immediately over the button  $j$ , carried by the plunger  $j'$ . By this means the circuit-closer can be operated manually at various  
30 points along the road to stop the cable in the manner above explained.

Instead of the devices above described for operating the T-shaped lever those shown in Fig. 5 may be adopted. In this form of the  
35 invention oscillatory rods 1 are mounted at the respective ends of the grip and provided at their lower ends with arms or wings 2, which when in their normal positions lie parallel with the face of the grip, but which when the  
40 oscillatory rods are moved will be projected outwardly and made to engage the T-shaped lever E and operate the circuit-closer in the manner above explained. To the upper end of each oscillatory rod a crank-arm 3 is se-  
45 cured, and said crank-arms are connected together by a rod or bar 4. The rod or bar 4 is connected to any suitable device on the platform of the car by means of which to operate it to oscillate said rods 1.

50 Instead of the devices above described for manipulating an electrical circuit for controlling the operation of a stop mechanism at the power-house, the devices shown in Figs. 3 and 4 may be employed. In this form  
55 of the invention a shaft 5 is mounted on the grip, preferably on one end thereof, and adapted to be operated from the platform of a car by means of any suitable devices. From the shaft 5 a crank-arm 6 projects, and to the  
60 end of said crank-arm a rod 7 is pivotally connected, the other end of said rod being pivotally connected to one end of a lever 8. The lever 8 is provided with an elongated slot 9 for the accommodation of a pin 10, by

which said lever is connected with the grip. 65 The framework of the conduit is made with a slot 11, through which a T-shaped bar 12 projects, said bar being made to enter between and electrically connect two contact-springs 13, with which wires leading to the stop mech- 70  
anism at the power-house are connected.

From the construction and arrangement of parts just described it will be seen that when the shaft 5 is oscillated the lever 8 will be turned and made to force the T-shaped bar 75 between the contact-springs 13, thus closing the circuit through said stop mechanism.

Various other slight changes might be made in the details of construction of our invention without departing from the spirit thereof or 80 limiting its scope, and hence we do not wish to limit ourselves to the precise details of construction herein set forth; but,

Having fully described our invention, what we claim as new, and desire to secure by Let- 85  
ters Patent, is—

1. In a cable railway, the combination with a conduit and a grip carried by a car, of contact devices located in the conduit, an arm mounted in the wall of the conduit adapted 90 to be disposed between the contact devices and the grip, and a movable device carried by the grip for operating said arm to close an electric circuit through said contact devices, substantially as set forth. 95

2. In a cable railway, the combination with a conduit, and a grip carried by a car, of a circuit closer located in said conduit, a plate pivoted to the grip, a lever pivoted in the conduit, a bell-crank lever adapted to engage the 100 circuit closer and to be engaged by said first-mentioned lever, and devices carried by said grip and adapted to be operated from the car for turning said pivoted plate and causing it to operate said levers to manipulate the cir- 105  
cuit closer, substantially as set forth.

3. In a cable railway, the combination with a conduit, and a grip carried by a car, of a circuit closer, a bar connected to said grip and having an inclined shoulder, a bell-crank lever pivoted to the grip and adapted to be op- 110 erated from the car for moving said bar, a plate pivotally connected to the grip and made with a shoulder to be engaged by the shoulder on said bar whereby to move said 115 plate outwardly, a T-shaped lever pivoted between its ends in said conduit and adapted to be operated by the movement of said pivoted plate, a bell-crank lever pivotally supported between its ends adapted to engage 120 said circuit closer and to be engaged by said T-shaped lever, said circuit closer being adapted to be connected in an electrical circuit with a stop mechanism at the power house, substantially as set forth. 125

4. In a cable railway, the combination with a conduit having hand-holes in its top, of a circuit closer located under each hand-hole and



adapted to be connected in circuit with a stop  
mechanism at the power house, and a spring  
sustained rod over each circuit closer, where-  
by to permit the operation of said circuit  
5 closer through the hand hole, substantially as  
set forth.

In testimony whereof we have signed this

specification in the presence of two subscrib-  
ing witnesses.

WILLIAM M. WOOD.  
JAMES C. MILLER.

Witnesses:

JOHN C. GALLAGHER,  
F. D. CROSS.