

(No Model.)

2 Sheets—Sheet 1.

I. BISHOP & A. F. L. BELL.
CABLE RAILWAY SWITCH.

No. 473,652.

Patented Apr. 26, 1892.

Fig. 1.

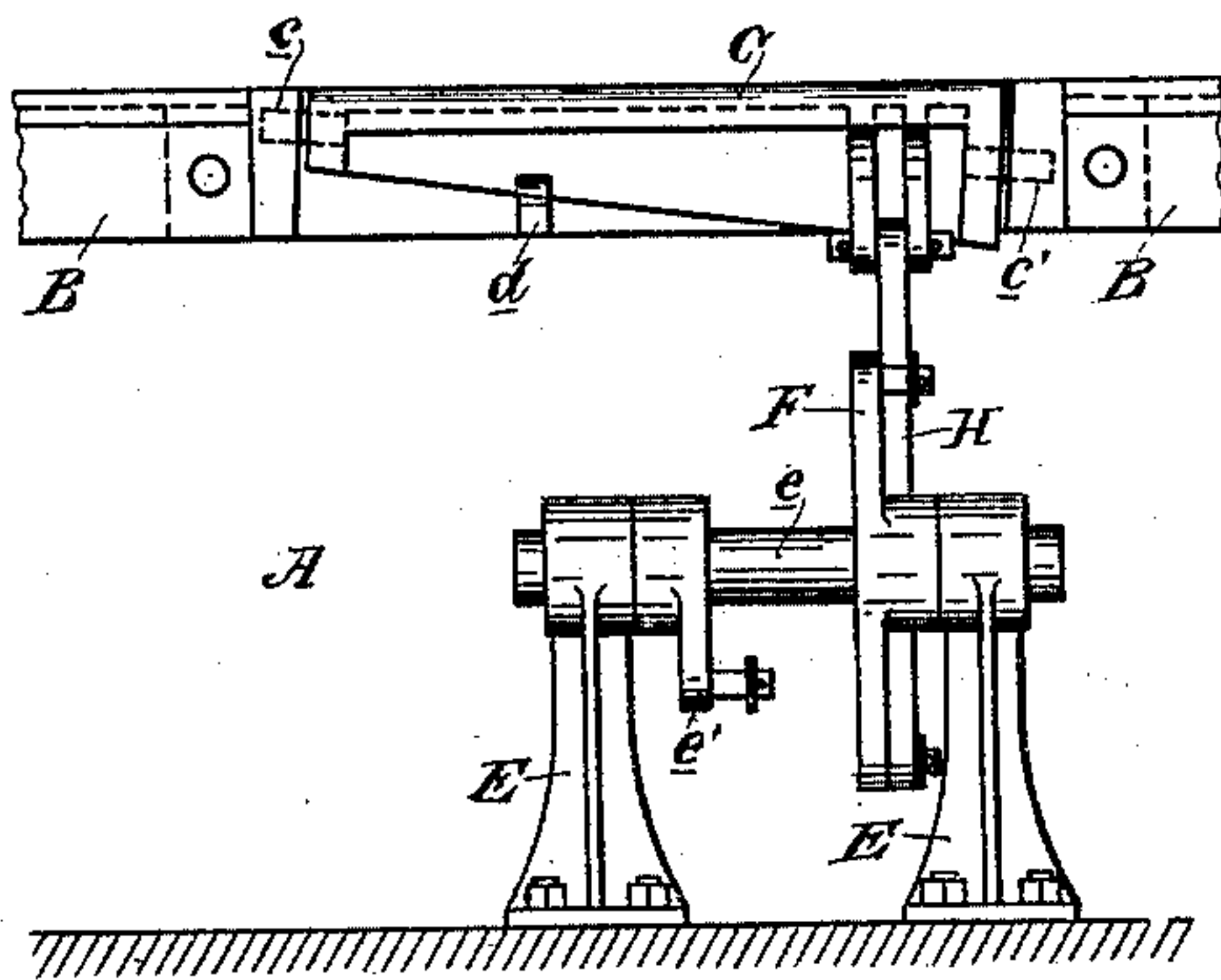


Fig. 2.

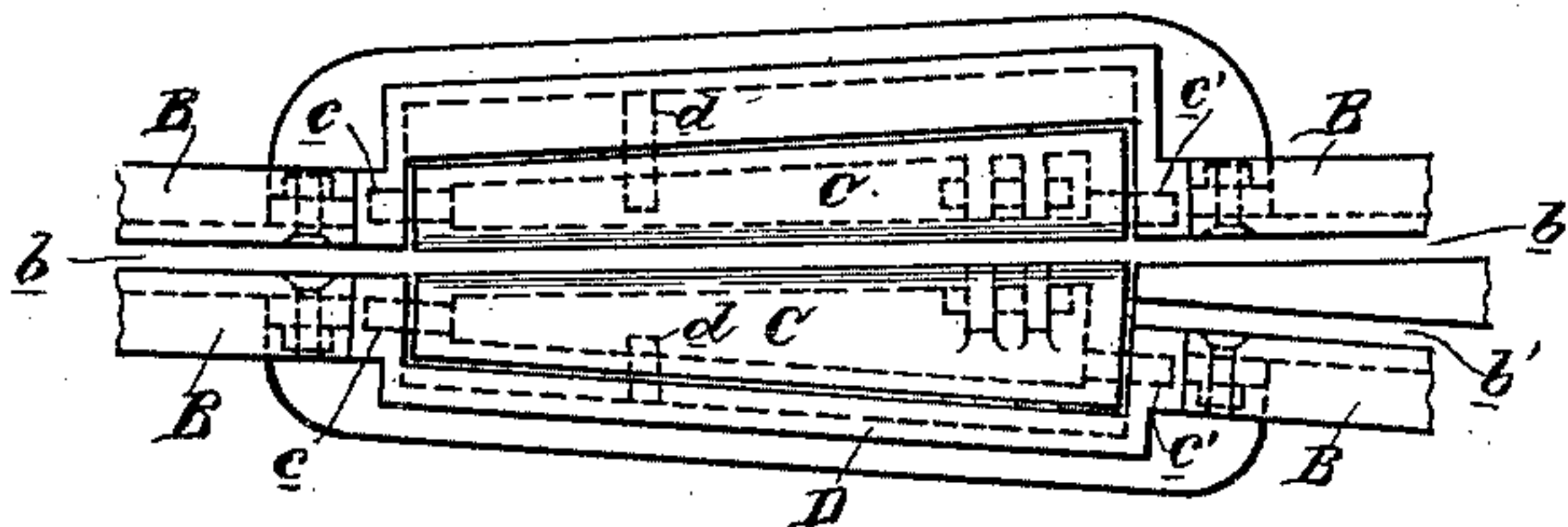
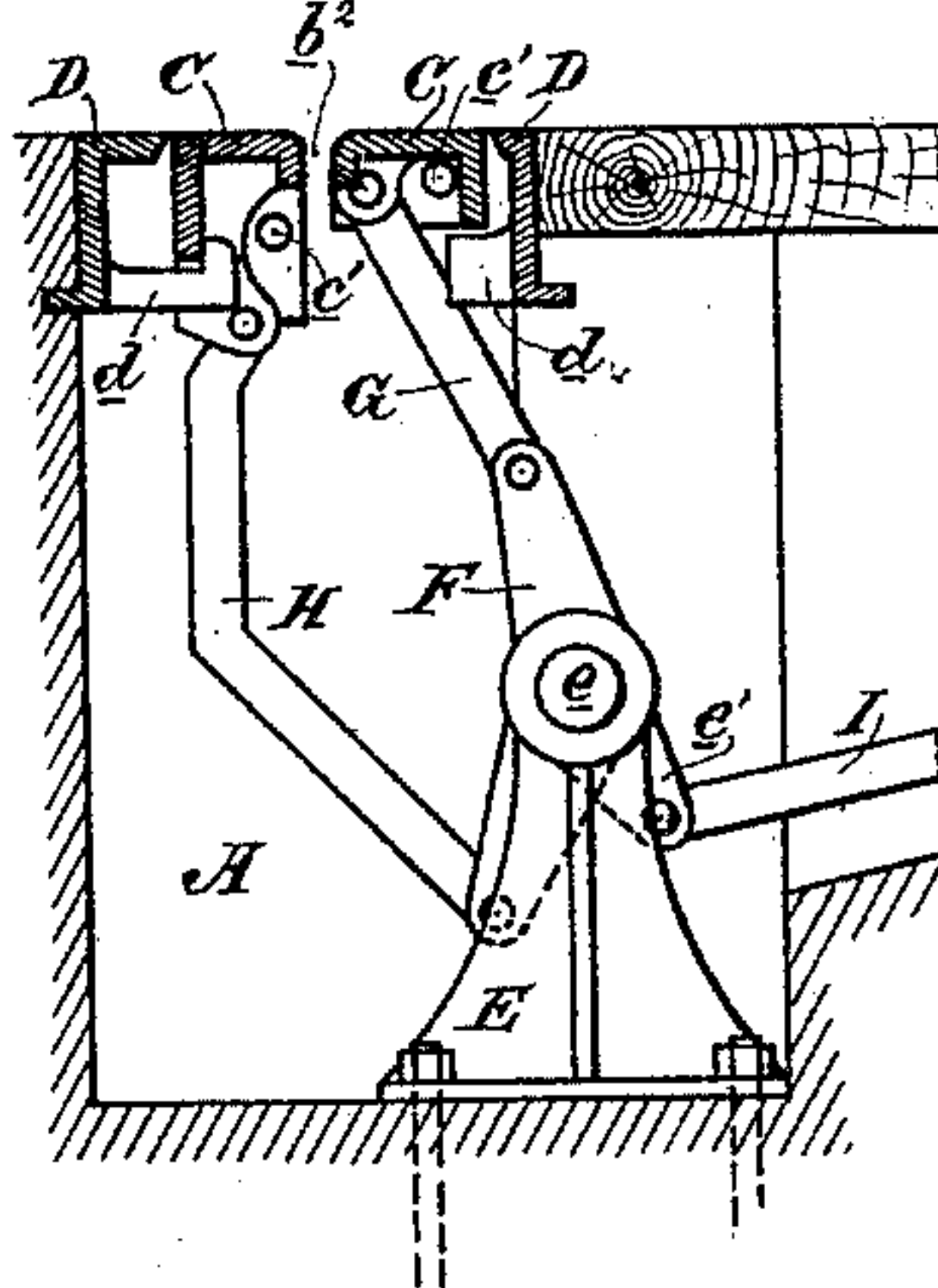


Fig. 3.

Fig. 4.

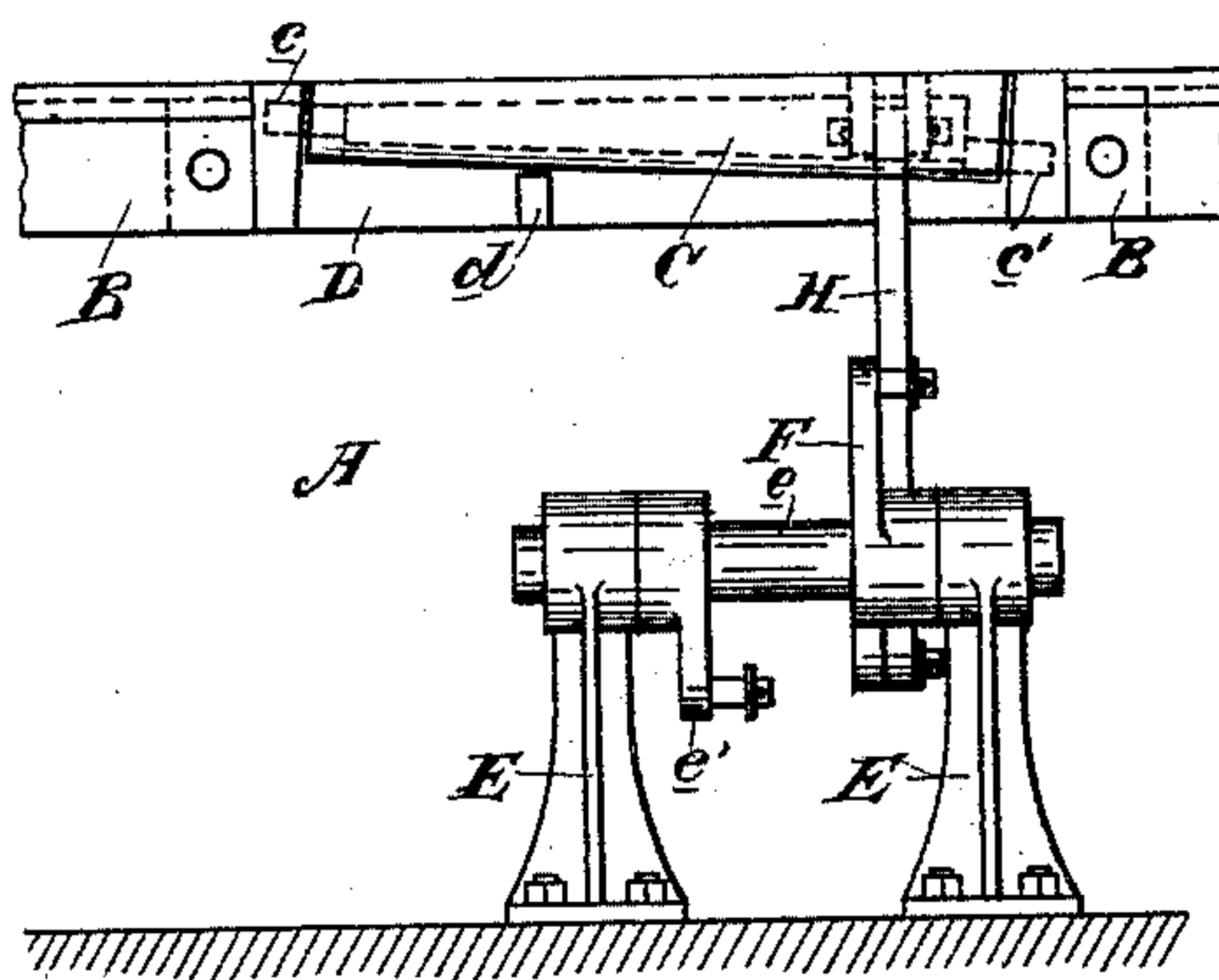


Fig. 5.

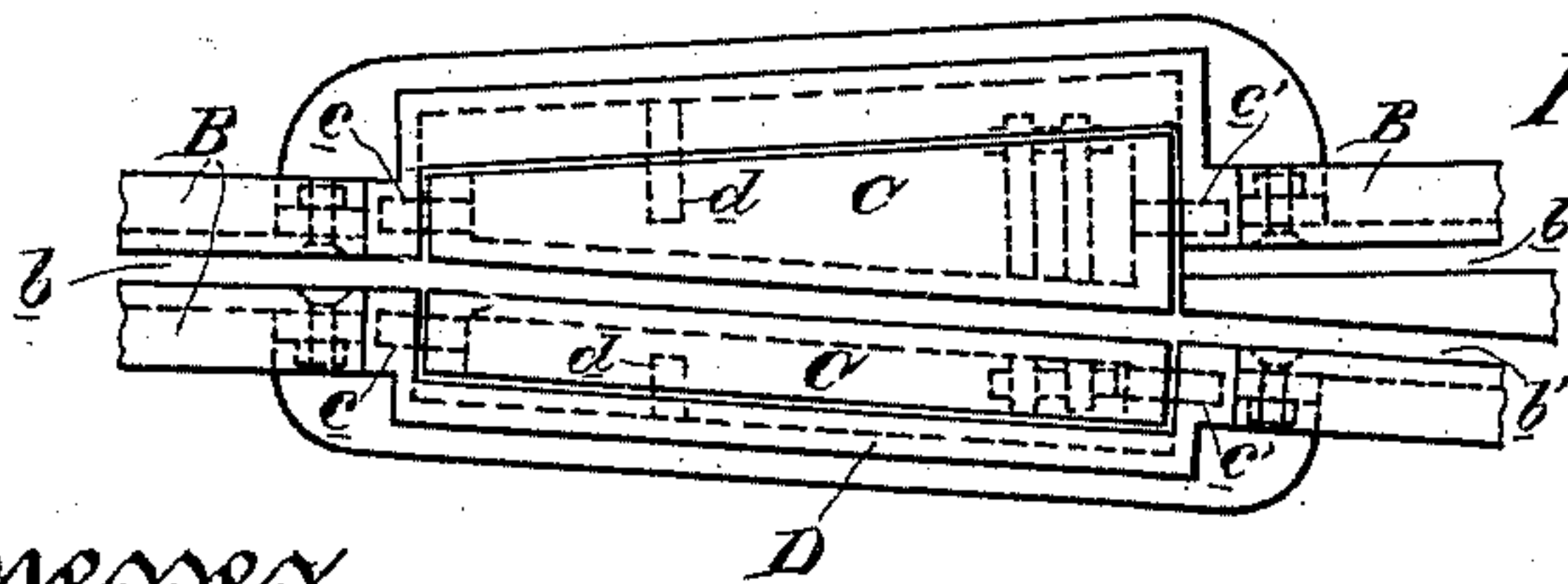
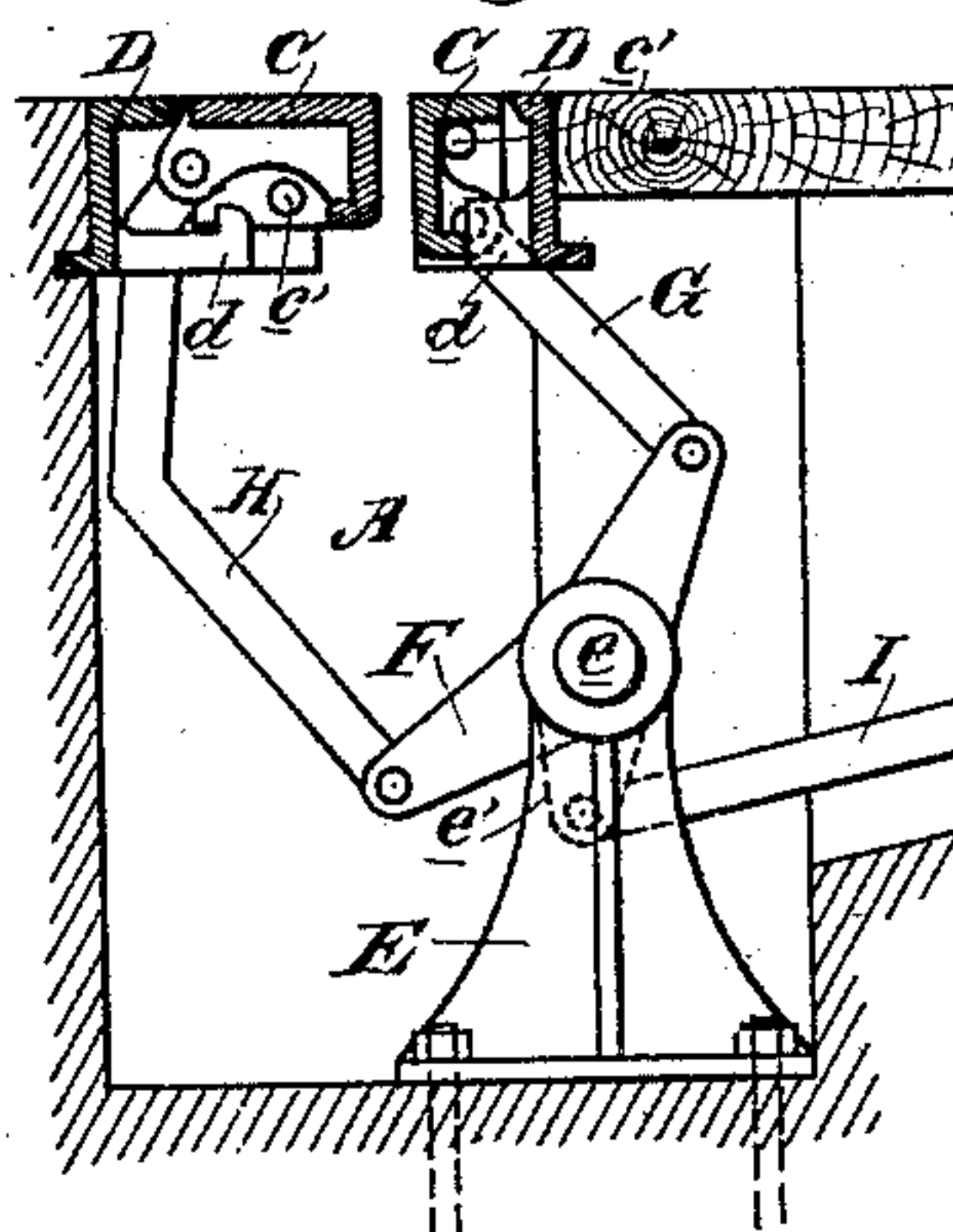


Fig. 6.

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2 Sheets—Sheet 2.

Patented Apr. 26, 1892.

Fig. 1.

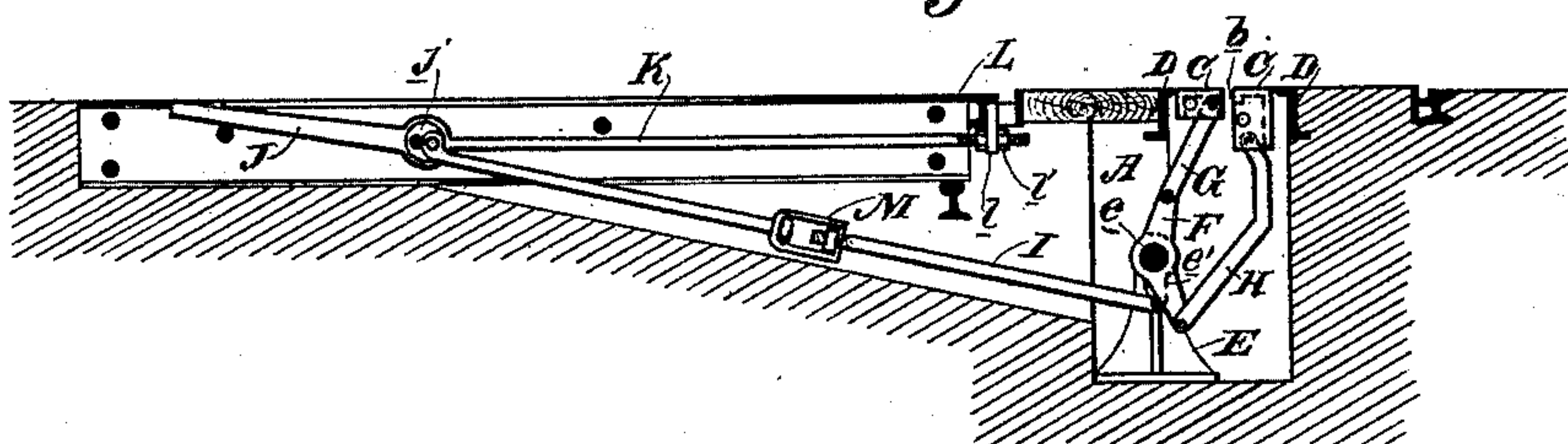
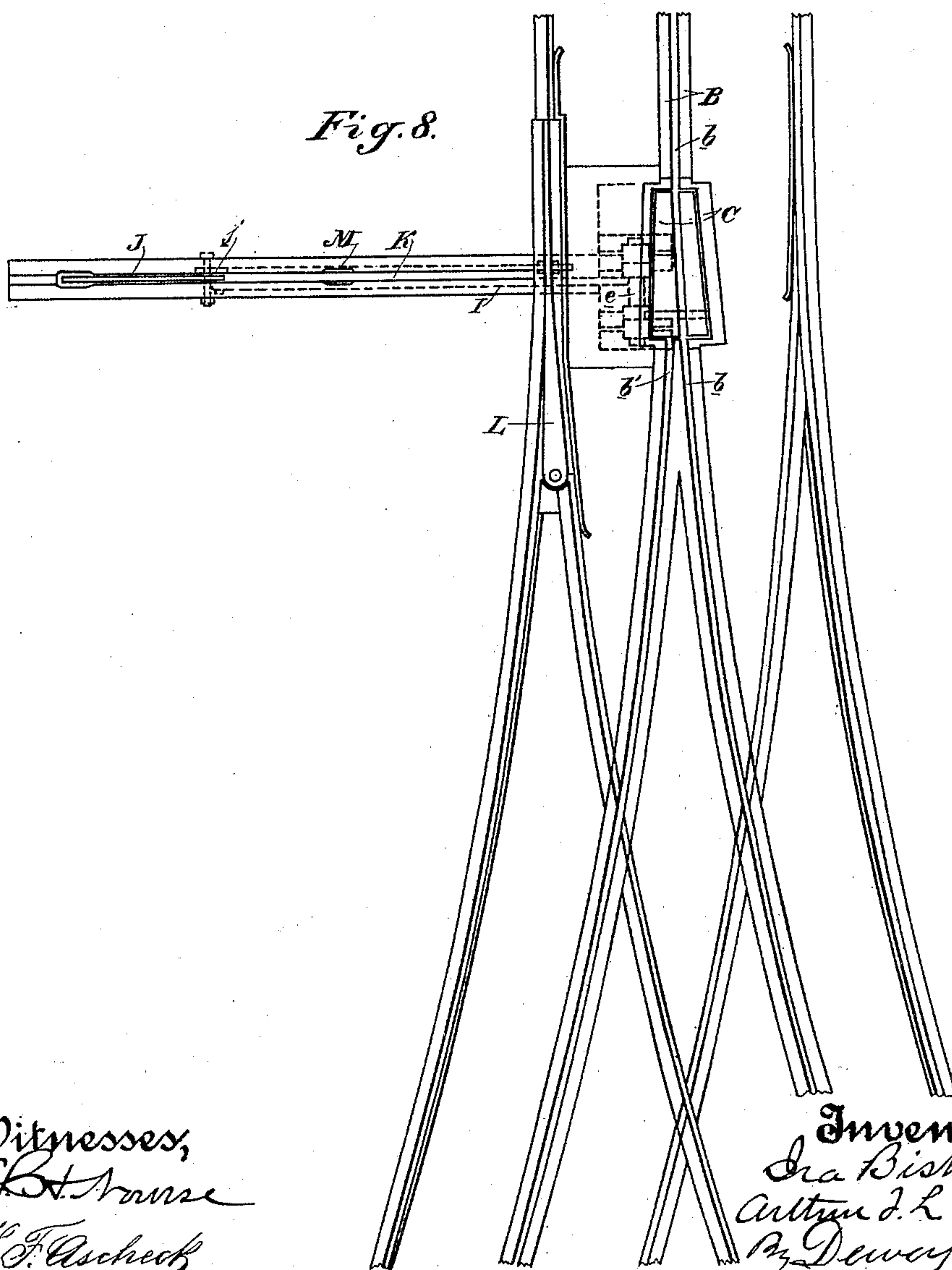


Fig. 8.



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UNITED STATES PATENT OFFICE.

IRA BISHOP AND ARTHUR F. L. BELL, OF SAN FRANCISCO, CALIFORNIA.

CABLE-RAILWAY SWITCH.

SPECIFICATION forming part of Letters Patent No. 473,652, dated April 26, 1892.

Application filed January 29, 1892. Serial No. 419,708. (No model.)

To all whom it may concern:

Be it known that we, IRA BISHOP and ARTHUR F. L. BELL, citizens of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Cable-Railway Switches; and we hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to that class of switches especially adapted, by reason of their control of the slot, to cable railways.

Our invention consists in opposing rotary sections of the slot-irons so mounted that the position of the space between them at one end shall always remain constant and in alignment with the inleading main slot and at the other end shall be variable and be brought into alignment with the outleading main slot or with the branch slot, according to the position to which the sections are rotated.

It also consists in connection with said rotary sections of the novel mechanism by which they are operated and the novel connections by which the track-switch is operated simultaneously with the slot-switch sections.

The object of our invention is to provide a simple and effective switch for the slots of cable railways, accurate in its operation and adapted without fail to throw one slot fully open while the other is fully closed.

Referring to the accompanying drawings for a more complete explanation of our invention, Figure 1 is a side elevation of our slot-switch in position to open the main slot and close the branch slot. Fig. 2 is a cross-section of the same, the operating mechanism being in elevation. Fig. 3 is a plan of the same. Fig. 4 is a side elevation of our slot-switch, the parts being in position wherein the branch slot is open and the main slot is closed. Fig. 5 is a cross-section of the same, the operating mechanism being in elevation. Fig. 6 is a plan of the same. Fig. 7 is an elevation showing the connection between the operating mechanism of the slot-switch and that of the track-switch. Fig. 8 is a plan of the same.

A is the tube or tunnel of the cable railway. In the upper portion of this are secured slot-irons B, between which are formed the main slot b and the branch slot b' , Figs. 3 and 6. At the point of divergence of these slots is located our switch.

C C are sections of slot-irons, which said sections form the switch. They are angular

bars set opposite each other, and a space is left between their adjacent sides, which may be termed the "switch-slot" b^2 . These sections are fitted in brackets D of suitable character, to which they are each pivoted by means of end pins or pivots, whereby they may be rotated through a quarter-revolution. At one end their pivot-pins c are so located that no matter to what position the sections may be turned the space or slot b^2 between them shall remain in alignment with the inleading main slot b , as is shown in Figs. 3 and 6. At their other ends their pivot-pins c' are so located that when said sections are turned to one position the space between them shall be in alignment with the outleading main slot b , as is shown in Fig. 3, and when turned to the other position the space between them shall be in alignment with the branch slot b' , as shown in Fig. 6. In the first case the branch slot is fully closed by one of the sections, and in the latter case the outleading main slot is fully closed by the other section. This arrangement is easily effected by what may be termed a "central location" of the pivot-pins at one end and an "eccentric location" of the pivot-pins at the other end, whereby it follows that by a quarter-rotation in opposite directions one way or the other the main slot is kept open while the branch slot is closed, and the branch slot is kept open while the main slot is closed.

It will be seen that these sections C C are here shown as having each at their eccentrically-pivoted ends sides of unequal width and at their centrally-pivoted ends sides of equal width. This, while not essential to the result of effecting a variation in the position of the space between them, which is due wholly to the position of their pivot-pins, is of advantage in practice in enabling them to always fill up the space between themselves and the adjacent edges of the brackets D, in which they are mounted, thus keeping the roadway filled up. Extending outwardly from the brackets D are fixed arms d , which serve as stops and supports for the rotary sections C C, so that they will come accurately to place and will remain stable under the weight of wagon traffic. Any suitable means may be provided for rotating the sections C C.

We show the following mechanism: Within the tube A is supported, in suitable bearings E, a rock-shaft e . Upon this shaft is secured

a cross-crank F, with the upper arm of which a link G is connected, the upper end of said link being connected with one of the switch-sections C. With the lower arm of the cross-crank is connected a link H, the upper end of which is connected with the other switch-section C. Upon the rock-shaft *e* is also mounted a crank-arm *e'*, to which a connecting-rod I is attached. The operation of this mechanism is plainly seen by reference to Figs. 2 and 5, which show the two positions assumed, the first in turning the slot-switch sections to a position to open the main slot and the second in turning the sections to a position to open the branch slot.

In Fig. 7 the necessary connection between the slot-switch-operating mechanism and the track-switch-operating mechanism is shown.

The connecting-rod I is attached at its outer end to the cam or eccentric head *j* of an operating-lever J. To this same head is connected a rod K, the other end of which is adjustably connected with a downwardly-extending lug *l* on the lower portion of the switch-tongue L, which said tongue is shown clearly in Fig. 8. The adjustable connection of the rod K with the lug *l* is made by threading it through said lug and controlling its position by nuts *l'*. A turn-buckle M may be located in the connecting-rod I to adjust its length when necessary.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A slot-switch for cable railways, consisting of opposing rotary slot-rail sections so mounted that at one end the position of the space between them shall be constant and remain in line with the inleading main slot and at the other end shall be variable and be brought by their rotation into line with either the outleading main slot or with the branch slot, substantially as herein described.

2. A slot-switch for cable railways, consisting of separated rotary slot-rail sections pivoted centrally at one end and eccentrically at the other end, whereby the position of their intervening space remains constant at the former end and is variable at the latter end, substantially as herein described.

3. A slot-switch for cable railways, consisting of the separated rotary slot-rail sections having the pivot-pins *c* at one end and the pivot-pins *c'* at the other end, said pins being so located that at the former end the position of their intervening space remains constant and in line with the inleading main slot and at the other end is variable to bring it in line with either the outleading main slot or with the branch slot, substantially as herein described.

4. In a cable railway, the rotary separated angular sections of the slot-switch, each of said sections having its sides of equal width at one end and unequal at the other end and each being so mounted that at the former ends the position of the space between them shall be constant and remain in line with the inlead-

ing main slot and at the latter ends shall be variable and be brought into line with either the outleading main slot or with the branch slot, substantially as herein described.

5. In a cable railway, the rotary separated angular sections of the slot-switch, each of said sections having its sides of equal width at one end and unequal at the other end, and each being pivoted centrally at the former ends, whereby the position of the space between them at said ends shall remain constant and in alignment with the inleading main slot and pivoted eccentrically at the latter ends, whereby the position of the space between them at said ends shall be variable and be brought into alignment with either the outleading main slot or with the branch slot, substantially as herein described.

6. In a cable railway, the combination of the rotary unequal-sided slot-rail sections forming the slot-switch, and the brackets D, in which they are mounted and operate, substantially as herein described.

7. In a cable railway, the combination of rotary slot-rail sections forming the slot-switch and the brackets D, in which they are mounted, said brackets having the stops and supports *d*, substantially as herein described.

8. In a cable railway, the combination of opposing separated slot-switch sections pivoted centrally at one end and eccentrically at the other, for the purpose described, and mechanism within the cable-railway tube for rotating said sections in opposite directions, substantially as herein described.

9. In a cable railway, the combination of opposing rotary slot-switch sections and the means for operating them, consisting of the rock-shaft, with the crank F, the links G and H, connecting the arms of said crank with said sections and the crank *e'* of the rock-shaft and the rod I, substantially as herein described.

10. A cable-railway switch consisting of opposing rotary slot-switch sections, the track-switch tongue L, the operating-lever J, having the eccentric or cam head, and connections from said head to the slot-switch sections and to the track-switch tongue, respectively, whereby they are operated simultaneously, substantially as herein described.

11. A cable-railway switch consisting of rotary slot-switch sections, the rock-shaft with its crank and connected links for operating said sections, the track-switch tongue L, the operating-lever J, with its cam-head, the rod I, connecting said head with the rock-shaft of the slot-switch sections, and the rod K, connecting said head with the track-switch tongue, substantially as herein described.

In witness whereof we have hereunto set our hands.

IRA BISHOP.

ARTHUR F. L. BELL.

Witnesses:

B. F. WILKINSON,
S. MCADAMS.