

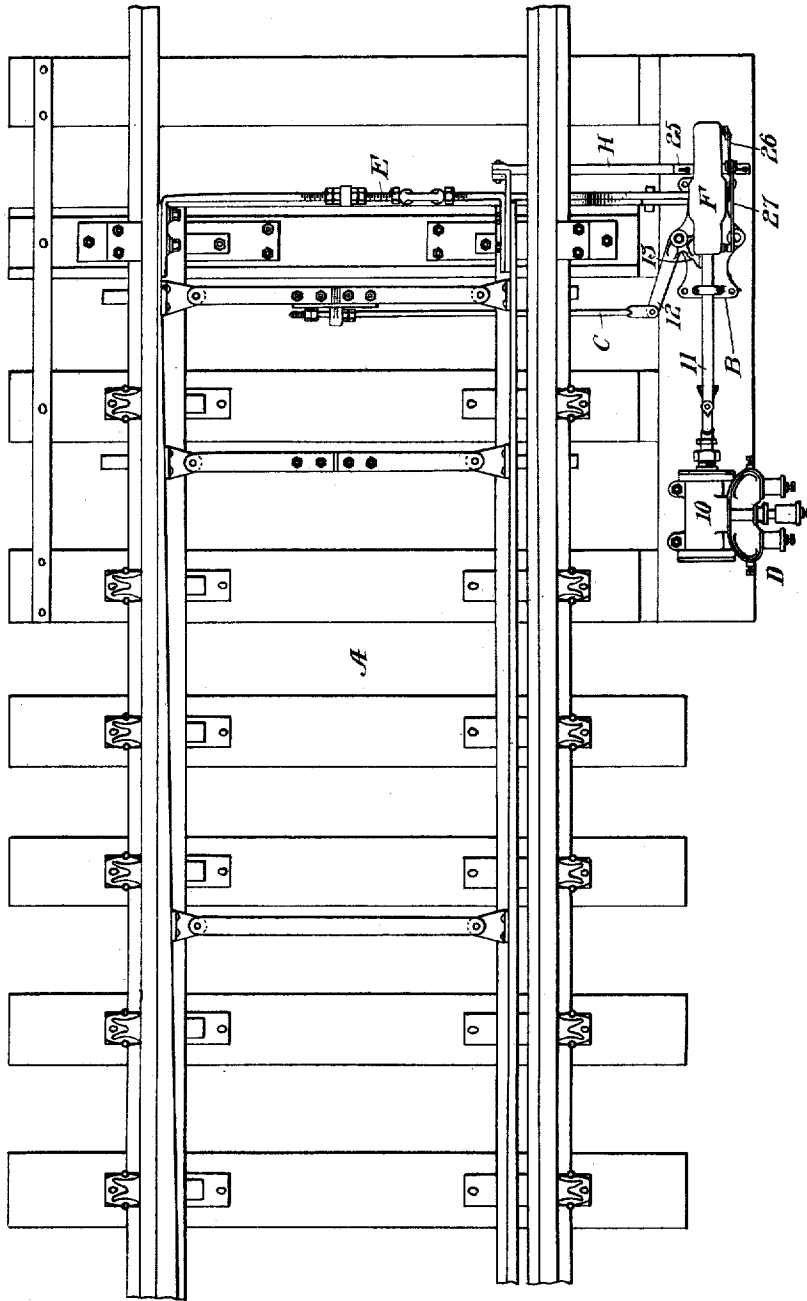
A. C. LIVERMORE.
CIRCUIT CONTROLLER.
APPLICATION FILED MAR. 16, 1911.

997,397.

Patented July 11, 1911.

3 SHEETS—SHEET 1.

FIG. 1



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CIRCUIT CONTROLLER.
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3 SHEETS—SHEET 2.

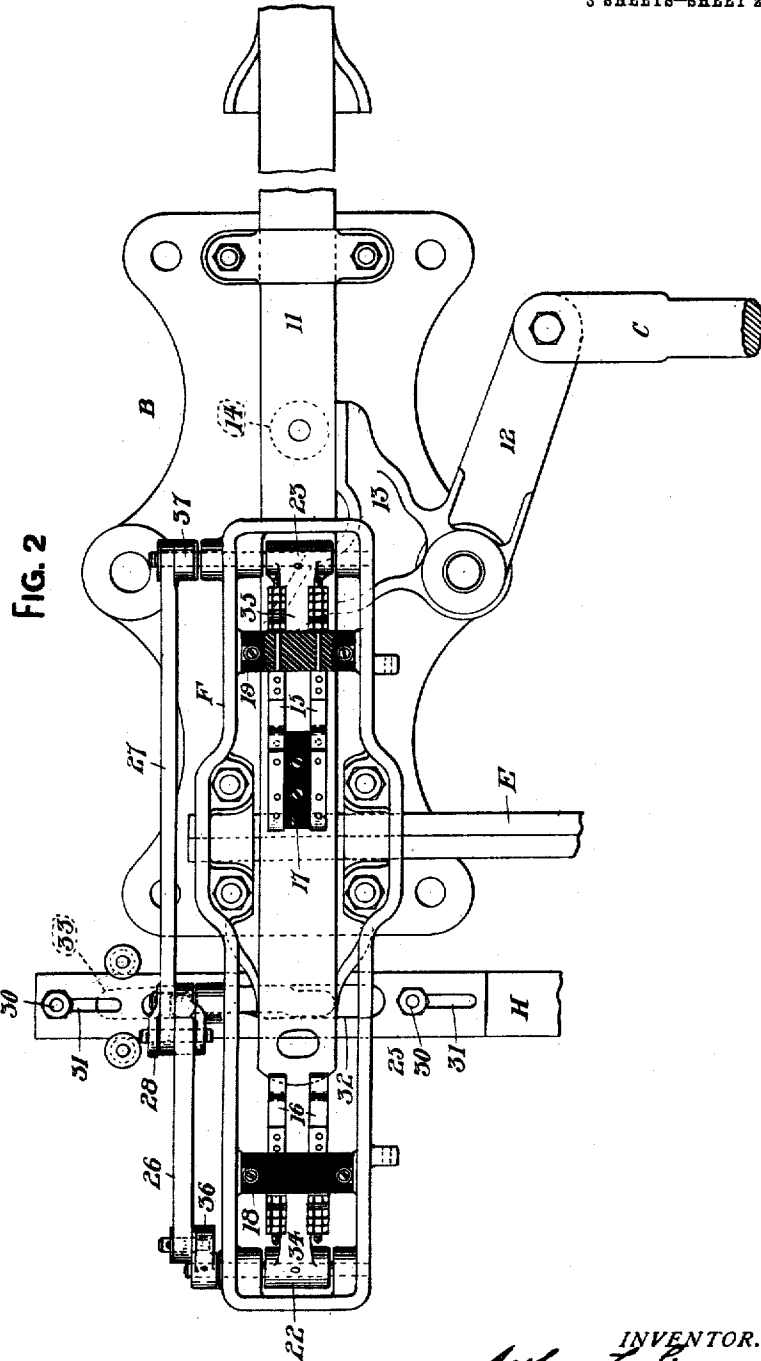


FIG. 2

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CIRCUIT CONTROLLER.
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3 SHEETS—SHEET 3.

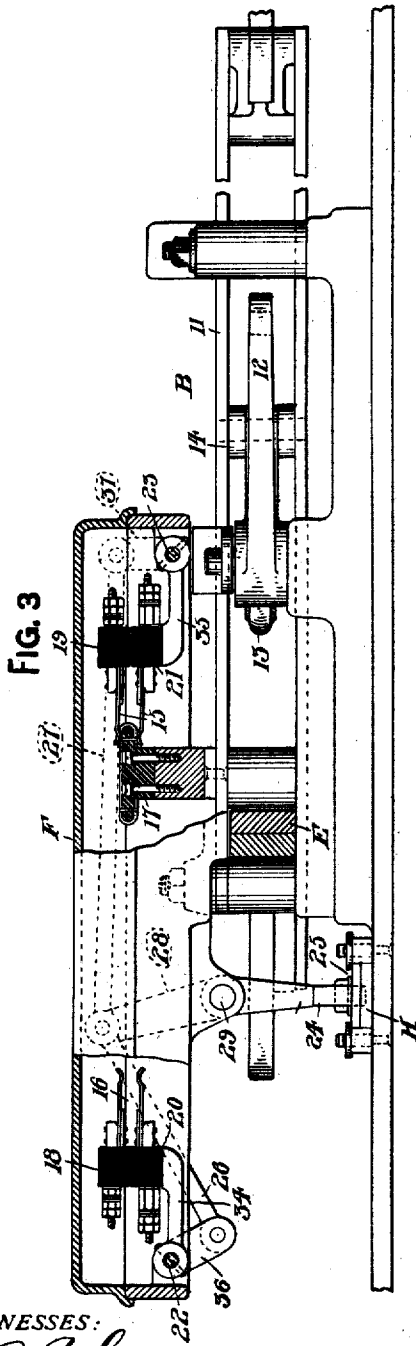


FIG. 3

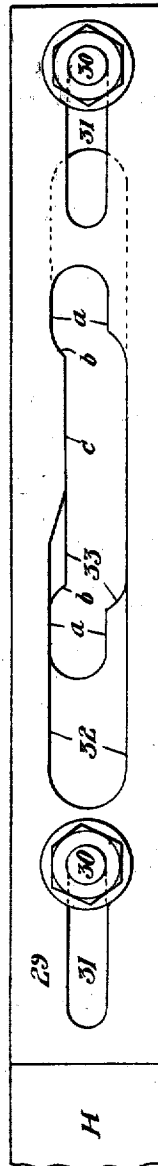


FIG. 4

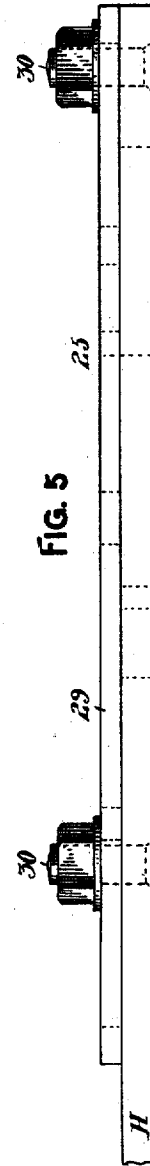


FIG. 5

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UNITED STATES PATENT OFFICE.

ARTHUR C. LIVERMORE, OF EDGEWOOD BOROUGH, PENNSYLVANIA, ASSIGNOR TO THE UNION SWITCH & SIGNAL COMPANY, OF SWISSVALE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

CIRCUIT-CONTROLLER.

997,397.

Specification of Letters Patent.

Patented July 11, 1911.

Application filed March 16, 1911. Serial No. 614,911.

To all whom it may concern:

Be it known that I, ARTHUR C. LIVERMORE, a citizen of the United States, residing in the borough of Edgewood, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Circuit-Controllers, of which the following is a specification.

My invention relates to circuit controllers operated conjointly by switch operating mechanisms and by switch rails.

I will describe one form of circuit controller embodying my invention, and then point out the novel features thereof in claims.

In the accompanying drawings, Figure 1 is a plan view showing a railway switch, an operating mechanism therefor, and a circuit controller embodying my invention.

Fig. 2 is a plan view showing on an enlarged scale a portion of the operating mechanism shown in Fig. 1, including the circuit controller, the cover for the circuit controller being removed. Fig. 3 is a view showing in side elevation, partly sectioned, the apparatus shown in Fig. 2. Figs. 4 and 5 are a plan view and side elevation respectively showing in detail a cam device shown in Figs. 2 and 3 and comprised in a circuit controller embodying my invention.

Similar reference characters refer to similar parts throughout the several views.

One feature of a circuit controller embodying my invention is the provision of means for positively moving the contacting members of the device into and out of position for engagement according to whether or not the movable rails of the switch are in an extreme position of their stroke; and for positively holding such contacting members out of engagement when the movable rails are not in an extreme position of their stroke, so that at such times all circuits controlled by the circuit controller are held open.

Referring now to Fig. 1, the reference character A designates a railway switch, the movable rails of which are operated by a switch operating mechanism B through the medium of an operating rod C. The operating mechanism B may be of a type such as is shown and described in United States Letters Patent No. 329,643, granted to J. T. Hambay, on November 3, 1885, although I

do not desire to limit myself to this particular type of mechanism, it being understood that a circuit controller embodying my invention may be employed in connection with any switch operating mechanism. The switch operating mechanism B is actuated by a suitable motor, here shown as being a pneumatic motor device D comprising a cylinder 10 whose piston is operatively connected with an operating bar 11 of the switch operating mechanism.

Referring now more particularly to Figs. 2 and 3, it will be seen that the operating mechanism B comprises a pivoted crank carrying on one arm an alligator jaw 13 and having its other arm 12 operatively connected with the switch operating rod C. The alligator jaw 13 is actuated by the longitudinal movements of the bar 11 through the medium of a roller or stud 14 carried by that bar, as fully explained in the above mentioned Patent No. 329,643.

E designates a lock rod secured to the movable switch rails and adapted to be locked by the operating mechanism B in a usual and well-known manner.

F designates a circuit controller embodying my invention. As here shown, this circuit controller comprises two sets of oppositely located contact springs 15 and 16, each set comprising two pairs of springs, and each pair comprising an upper and a lower spring.

17 designates a contacting member or bridging member carried by an operating bar 11 and adapted to electrically connect the two contact springs of each pair in one set or the other according to whether the operating mechanism is in one extreme position of its movement or the other. Although I have here shown two pairs of contact springs in each set, I do not wish to limit myself to this particular number. In fact any desired number of pairs may be employed according to the number of circuits to be controlled; if desirable, only one set of springs may be employed, so located that they will be engaged by the contacting member 17 when the operating mechanism is in one extreme position of its movement.

In order to control the signal or other circuits by the actual position of the switch rails, I provide means for positively moving one of the contact springs of each pair into and out of position for engagement with the

contacting member 17 according to whether or not the switch rails are in an extreme position of their stroke. In the illustrated embodiment of my invention, one of the contact springs of each pair, here shown as being the upper spring, is mounted in a block 18 or 19 of insulating material, which blocks are rigidly secured to the framework of the circuit controlling device. The other contact spring of each pair is mounted in a block 20 or 21, of insulating material, the block 20 being mounted on an arm 34 carried by a rocking shaft 22, and the block 21 being similarly mounted on an arm 35 carried by a rocking shaft 23.

36 designates an arm secured to the rocking shaft 22, to which arm is pinned a link 26. Similarly 37 designates an arm secured to rocking shaft 23, to which arm is pinned a link 27. These links 26 and 27 are both connected with a rocker arm 28 pivoted at a point 29. The lower end of rocker arm 28 carries a dog 24 which coacts with a cam 25. This cam is rigidly connected with the switch rails by a bar H (see Fig. 1), and may be constructed in a manner such as I will now describe.

Referring more particularly to Figs. 4 and 5, it will be seen that the cam 25 comprises the bar H and a plate 29 fastened together by means of bolts 30. The plate 29 is provided with a suitable slot 32, and the bar H with a suitable slot 33, which slots are so cut as to accommodate the dog 24 and to move this dog in one direction or the other according to whether or not the switch rails are in an extreme position of their stroke. The bolt holes in the plate 29 are elongated to form slots 31 by means of which the plate may be adjusted relatively to the bar H in order to adjust the cam, to effect the proper movements of the dog 24 according to the length of the stroke of the switch rails.

The operation of the cam 25 and the dog 24 is as follows: When the switch rails are in one extreme position or the other of their stroke, the dog 24 is held by cam surfaces *a*, in which position the movable contact springs in the sets 15 and 16 are held in position for engagement with the contacting member 17. This position of the parts is shown in Figs. 2 and 3. When, however, the switch rails are moved a small distance away from one of their extreme positions, the dog 24 is immediately moved by cam surface *b*, by which movement the movable contact springs are rocked out of position for engagement with the contacting member 17. As long as the switch rails are not in one of their extreme positions, the contact springs are positively held in this non-engaging position by the engagement of cam face *c* with the dog 24. One of the important features of my invention is this positive movement of the contact springs into and

out of engaging position, and the positive holding of the contact springs out of engaging position while the switch rails are not in an extreme position of their stroke.

It will be evident from the foregoing description that any circuits which may be controlled by the contact springs 15 and 16 will be closed only when the movable switch rails are in an extreme position of their stroke, and that a very slight displacement of these movable rails from such extreme positions will effect an opening of all circuits controlled by the contact springs.

Having thus described my invention, what I claim is:

1. In combination, a switch rail; a switch operating mechanism connected therewith; a circuit controller comprising a contact spring, a contacting member operatively connected with the switch operating mechanism and adapted to engage with the contact spring when the said operating mechanism is in one extreme position of its movement; and means operatively connected with the switch rail for moving the contact spring into and out of position for engagement with the contacting member according to whether or not the switch rail is in an extreme position of its stroke.

2. In combination, a switch rail; a switch operating mechanism connected therewith; a circuit controller comprising a pair of contact springs, a contacting member operatively connected with the switch operating mechanism and adapted to engage with the contact springs when the said mechanism is in one extreme position of its movement; and means operatively connected with the switch rail for moving one of the contact springs into and out of position for engagement with the contacting member according to whether or not the switch rail is in an extreme position of its stroke.

3. In combination, a switch rail; a switch operating mechanism connected therewith; a circuit controller comprising two oppositely arranged sets of contact springs each set having a plurality of pairs of springs, a contacting member operatively connected with the switch operating mechanism and adapted to engage with one of the sets of contact springs or the other when the said mechanism is in one extreme position of its movement or the other; and means operatively connected with the switch rail for moving one of the contact springs of each pair into and out of position for engagement with the contacting member according to whether or not the switch rail is in an extreme position of its stroke.

4. In combination, a switch rail; a switch operating mechanism connected therewith; a circuit controller comprising a contact spring, a contacting member operatively connected with the switch operating mechanism

nism and adapted to engage with the contact spring when the said mechanism is in one extreme position of its movement; means operatively connected with the switch rail for holding the contact spring in position for engagement with the contacting member when the switch rail is in an extreme position of its stroke, and for holding the contact spring out of position for engagement with the contacting member when the switch rail is not in an extreme position of its stroke.

5. In combination, a switch rail; a switch operating mechanism connected therewith; a circuit controller comprising a contacting member operatively connected with the operating mechanism, a rocking shaft, a contact spring carried thereby; and mechanism interposed between the switch rail and the rocking shaft and operated by the switch rail for rocking the contact spring into and out of position for engagement with the contacting member according to whether or not the switch rail is in an extreme position of its stroke.

6. In combination, a switch rail; a switch operating mechanism connected therewith; a circuit controller comprising a contacting member operatively connected with the op-

erating mechanism, a rocking shaft, a contact spring carried thereby; a cam device connected with the switch rail, a rocker arm, a dog carried by the rocker arm and coacting with the cam device, and a link connecting the rocker arm with the rocking shaft.

7. In combination, a switch rail; a switch operating mechanism operatively connected therewith; a circuit controller comprising a rocking shaft, a contact spring carried thereby, a contacting member operatively connected with the switch operating mechanism and adapted to engage with the contact spring when the said mechanism is in an extreme position of its movement; and mechanism interposed between the switch rail and the rocking shaft and operated by the switch rail for rocking the contact spring into and out of position for engagement with the contacting member according to whether or not the switch rail is in an extreme position of its stroke.

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

ARTHUR C. LIVERMORE.

Witnesses:

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I. J. HARTER.