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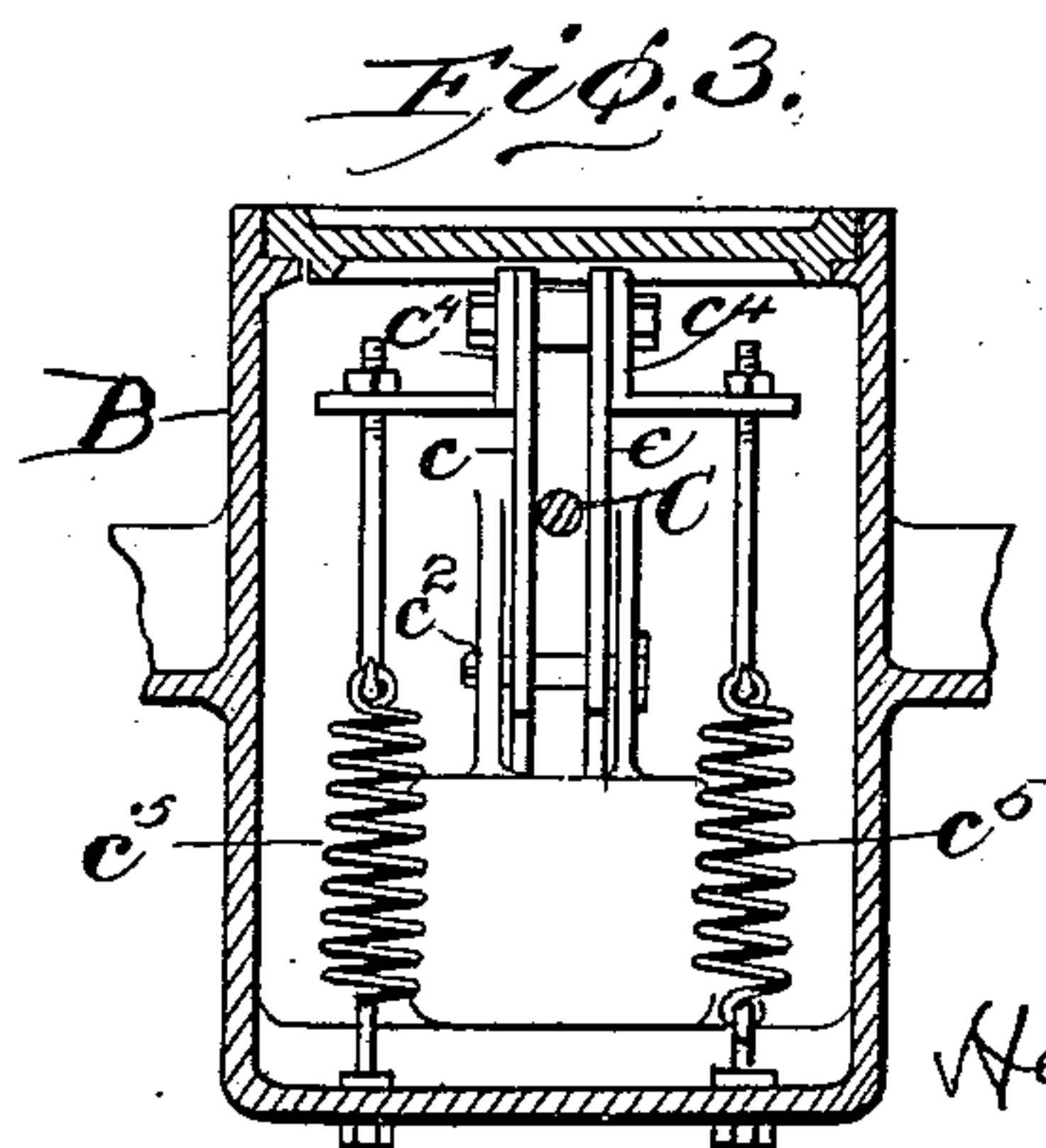
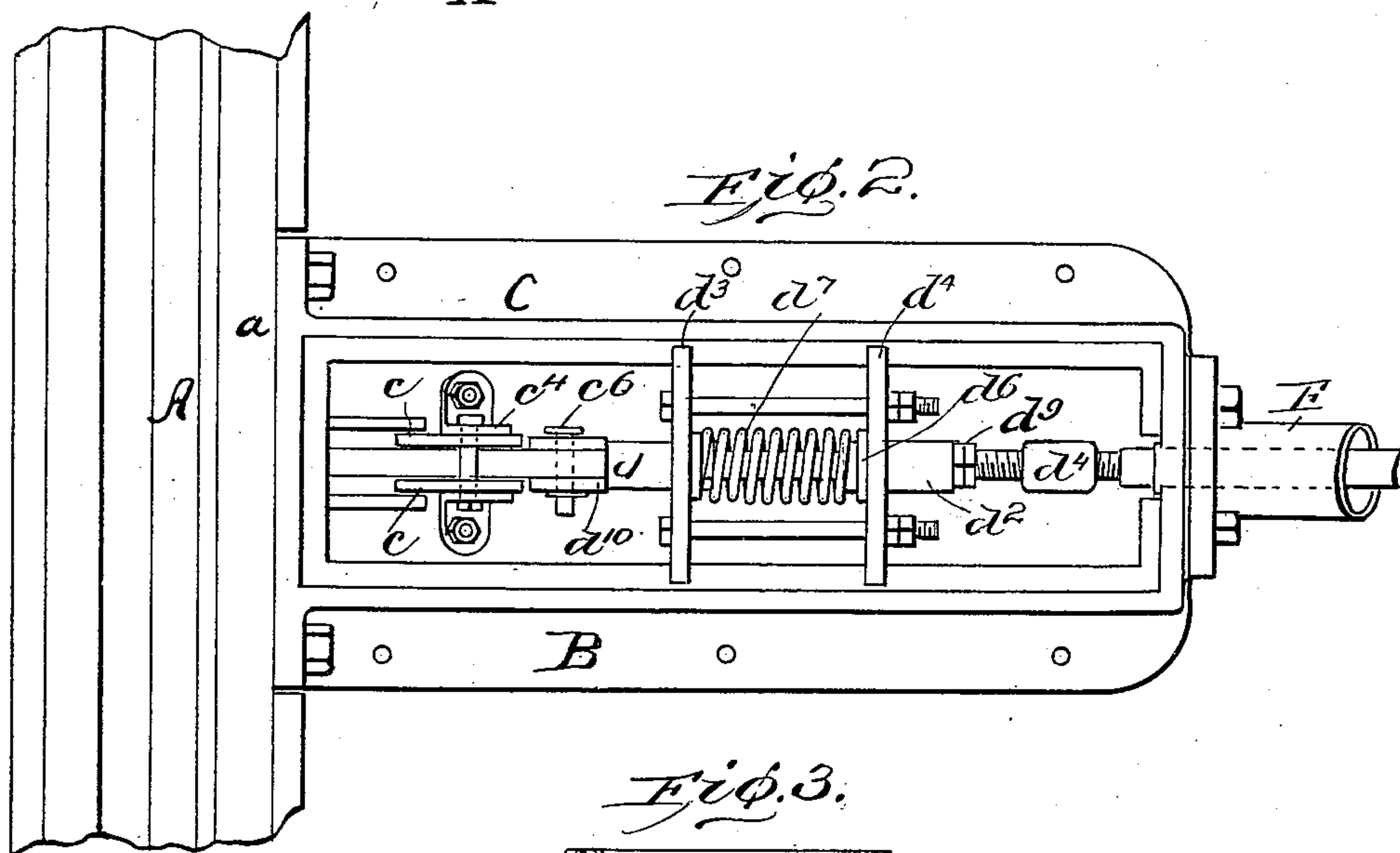
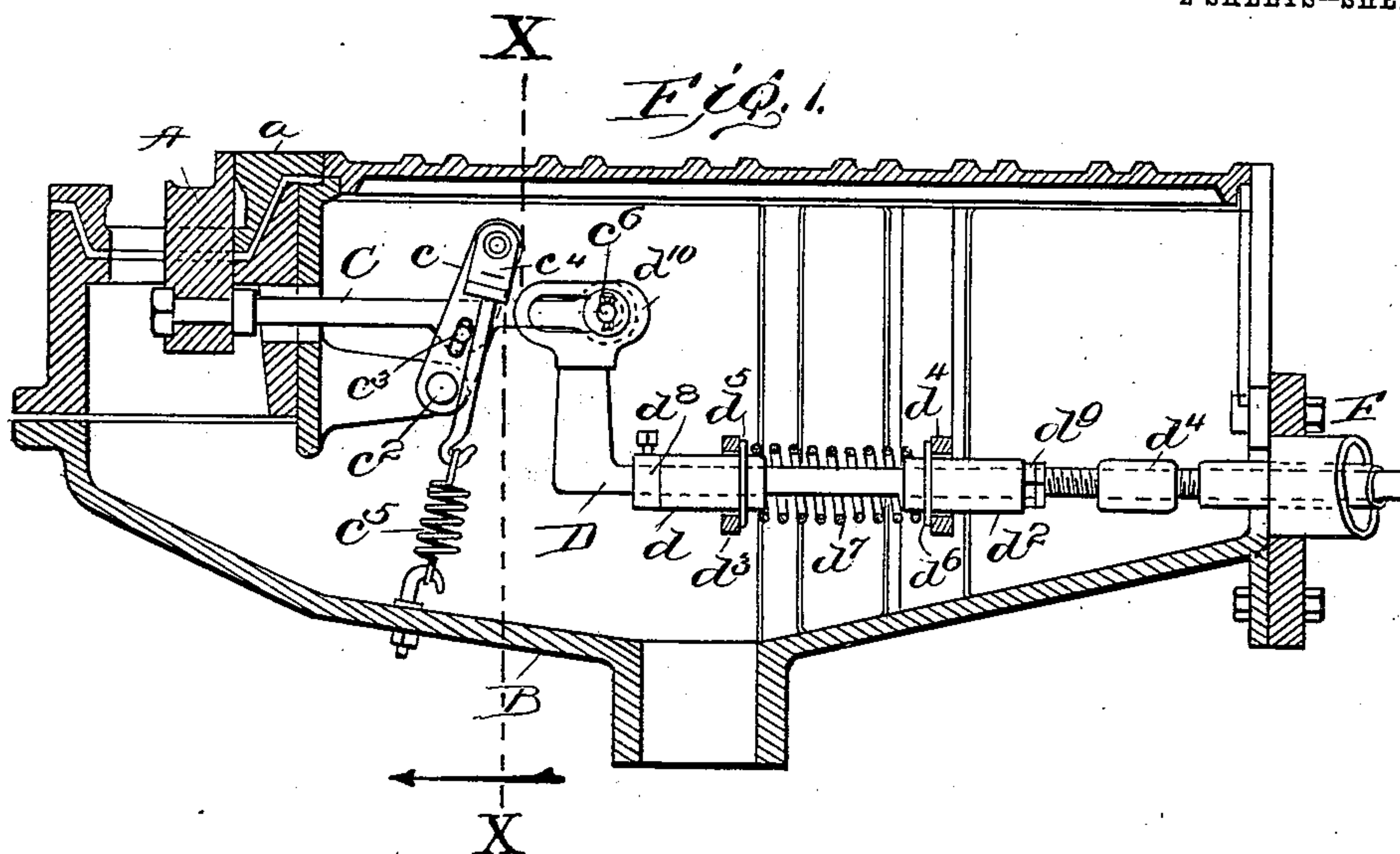
PATENTED FEB. 2, 1904.

H. B. NICHOLS.
RAILWAY SWITCH MECHANISM.

APPLICATION FILED JULY 20, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



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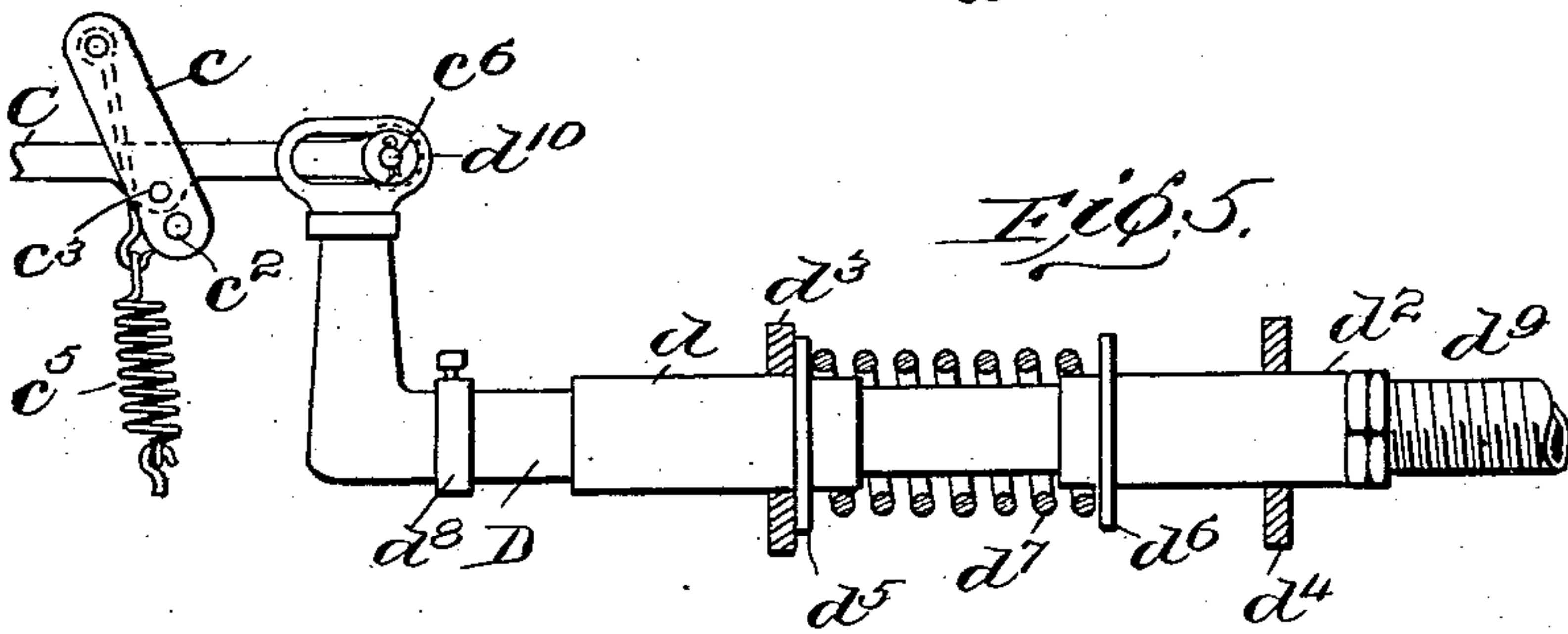
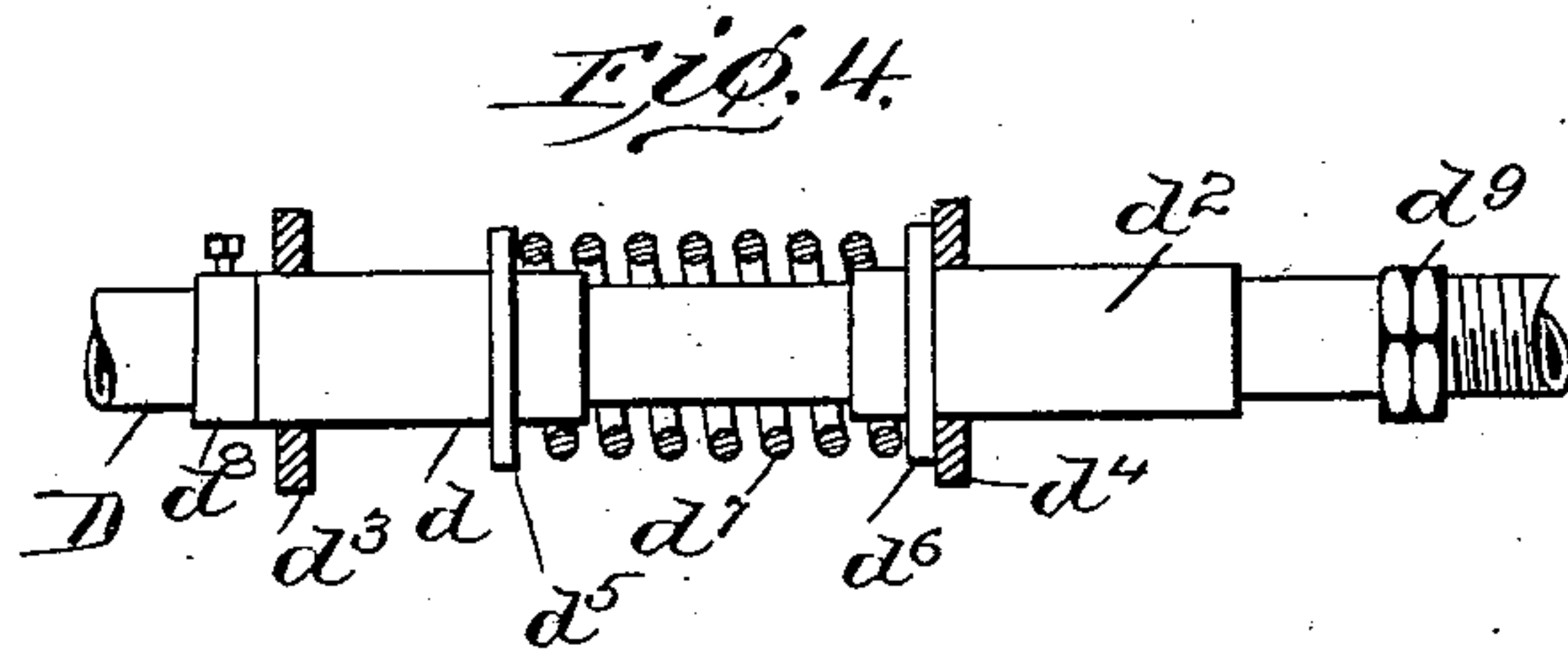
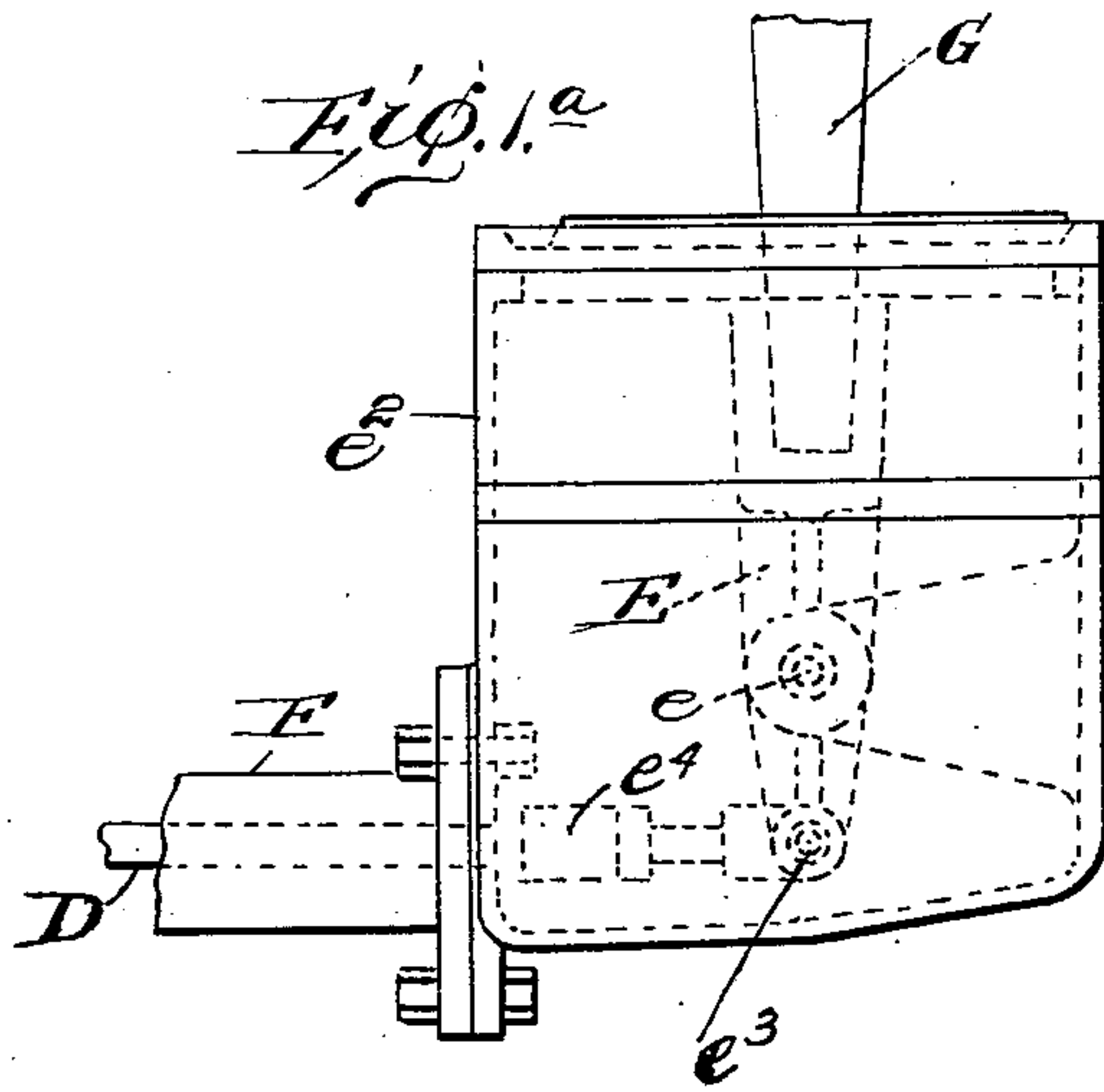
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2 SHEETS—SHEET 2



Witnesses

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UNITED STATES PATENT OFFICE.

HENRY B. NICHOLS, OF PHILADELPHIA, PENNSYLVANIA.

RAILWAY-SWITCH MECHANISM.

SPECIFICATION forming part of Letters Patent No. 750,996, dated February 2, 1904.

Application filed July 20, 1903. Serial No. 166,381. (No model.)

To all whom it may concern:

Be it known that I, HENRY B. NICHOLS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Railway-Switch Mechanism, of which the following is a specification.

My invention relates to railway-switch mechanism—that is, the mechanism or means through which a movable rail member is acted upon in effecting a switching operation, and has for one of its objects the provision of means for operating a switch from a point more or less distant from the track, at the same time permitting the operation of the movable switch member at the track independently.

A further object is to provide an operating-lever capable of movement in at least two directions for actuating the switch from a distance, positive means for retaining the movable member or members in either of its or their operative positions, and means to restore and maintain the operating-lever to and in a predetermined intermediate position after its movement in either direction irrespective of the position of the movable switch member or members.

A further object is the general improvement of railway-switch mechanism and the details of construction of the same, as will more fully hereinafter appear.

While the invention is particularly designed and peculiarly suited for application to street-railway work and while I shall illustrate and describe it in such an embodiment, I wish it to be understood that the invention is also well adapted with but slight modification to railway work in general. Also while I have shown the switch mechanism placed in casings below the street and sidewalk level, so as to be out of the way of surface travel, it will be understood that with but slight changes in details and proportions of parts the invention is readily adaptable to general surface work. These and other modifications are contemplated as strictly within the scope of the invention.

An embodiment of my invention is illustrated in the accompanying drawings, in which—

Figure 1 is a central longitudinal section showing my switch mechanism or the principal part thereof contained within an inclosing casing. Fig. 1^a is a side view of the remainder of said mechanism, showing the operating-lever. Fig. 2 is a plan view of the portion shown in Fig. 1, the cover of the casing being removed. Fig. 3 is a transverse sectional view taken on the line $x-x$ of Fig. 1 looking in the direction of the arrow. Fig. 4 is a detail showing one of the parts in one of its operative positions; and Fig. 5 is another detail, showing another position of the same part with the addition of retaining means for the switch-rod.

Referring to the drawings, A is a movable switch member or point mounted in any suitable way at the intersection of two railway-tracks upon the rail portion a . Adjacent to this part of the track is an inclosing casing B, in which is contained the greater portion of the switching mechanism. Connected to the lower part of the movable switch member A is a switch-rod C, the other end of which is joined by a lost-motion connection to an extension-rod D, by means of which motion may be transmitted to the switch-rod C and thence to the movable switch member A from a distance more or less remote from the track. This point may be located at the edge of the sidewalk, where an operating-lever E is provided, pivoted at e within the casing e^2 . The extension-rod works within a connecting-tube F, which is joined at one end to the casing B and at the other end to the casing e^2 .

Owing to the jarring of the car-wheels upon the track and the passage of other vehicles over the switch, the movable switch-point as ordinarily constructed often becomes displaced, thereby causing annoyance, inconvenience, and delay. I therefore provide means for retaining the movable switch member positively in either of its operative positions, these means consisting in this instance of pivoted arms c , pivoted at c^2 to lugs upon the casing, these arms being connected to the switch-rod C by the pivot c^3 . The free ends of arms c are connected above the switch-rod by a yoke c^4 , which is extended for the attachment upon either end thereof of tension-springs c^5

by means of bolts. These springs are attached at their lower ends to the bottom of the casing, as shown in Figs. 1 and 3, and exert a pressure downward upon the arms c upon either side of their pivot c^2 when said arms are rocked upon said pivot, thereby retaining the switch-rod C, and consequently the movable switch member A, in either its extreme right-hand or left-hand position.

The extension-rod D has slidingly mounted upon it two sleeves d d^2 , which are journaled in fixed lugs d^3 d^4 . The sleeves d d^2 have flanges d^5 d^6 , respectively, pressed outwardly from between said lugs by a compressed coiled spring d^7 . A fixed collar d^8 upon the extension-rod D is adapted to force the sleeve d against the resistance of spring d^7 when the extension-rod is moved in one direction, and a collar d^9 is adapted to force the sleeve d^2 against the pressure of said spring when the extension-rod is moved in the opposite direction.

The lost-motion connection between the switch-rod C and the extension-rod D consists in this instance of a slotted enlargement d^{10} upon said extension-rod, in which moves a connecting-pin c^6 , secured to the switch-rod. The said slot is of such length that when the extension-rod D is in its normal or intermediate position (shown in Fig. 1) the pin c^6 may travel within the slot and lie against either of its ends when the switch-rod C is in either of its extreme positions.

The lower end of the operating-lever E is pivoted at e^3 to the distant end of the extension-rod D, suitable adjusting-nuts being provided, as at e^4 d^{11} . An operating-handle G is fitted to the operating-lever E and forms an extension of the latter, projecting through the cover of the inclosing casing e^2 , as shown in Fig. 1^a.

The operation of the switch mechanism as thus described is as follows: In Fig. 1 the movable switch member A is shown in its extreme right-hand position, where it is held by the tension of springs c^5 . In order to move the switch member A to its other extreme position in effecting a switching operation, the operating-handle G is moved to the right, thus causing the extension-rod to move in the opposite or left direction. By a contact of the lock-nuts or collar d^9 with sleeve d^2 this movement forces said sleeve along through bearing-lug d^4 , compressing spring d^7 . In this movement the extension-rod slips through sleeve d , which remains stationary, and by pressure upon connecting-pin c^6 moves the switch-rod C in the same direction until arms c pass over center, when the tension of springs c^5 assists in continuing this movement and throws the rods C and the movable switch member A into their extreme left-hand position, as shown in Fig. 5. The handle G is then released, and spring d^7 then returns the extension-rod D and the operating-lever E to their original positions. Simi-

larly in switching back to the first position handle G is moved in a left-hand direction, thus compressing spring d^7 in the opposite direction, as shown in Fig. 4, and again throwing arms c over center. When it is desired to operate the switch at the track itself, as by means of a bar held by the motorman or by an attendant standing at the switch, this is done in the usual manner, and the switch-rod C then moves freely, pin c^6 working within the slot upon extension-rod D and springs c^5 acting as before. It will thus be seen that the switch may be moved and is held in either of its operative positions independently of the position of the extension-rod D, and when the switch has been operated by the operating-lever E the extension-rod is automatically returned to its normal or intermediate position irrespective of the operative position of the movable switch member.

Having described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination with a movable switch member, of a switch-rod connected thereto, an extension-rod, and a lost-motion connection between said switch-rod and said extension-rod.

2. The combination with a movable switch member, of a switch-rod connected thereto, an extension-rod, a slotted enlargement upon said extension-rod, and coöperating means upon said switch-rod working within said slot.

3. The combination with a movable switch member, of a switch-rod connected thereto, an operating-lever in mechanical relation to said switch-rod, means for retaining said movable switch member in either of its operative positions, and means for maintaining said operating-lever in a predetermined position independent of the position of said switch member and switch-rod.

4. The combination with a movable switch member, of a switch-rod connected thereto, an operating-lever in mechanical relation to said switch-rod, spring-pressure means connected to said switch-rod for retaining said movable switch member in either of its operative positions, and means for maintaining said operating-lever in a predetermined position independent of the position of said switch member and switch-rod.

5. The combination with a movable switch member, of a switch-rod connected thereto, an extension-rod having a lost-motion connection with said switch-rod, an operating-lever connected to said extension-rod, and automatic means for restoring said operating-lever to a predetermined position after a switching operation.

6. The combination with a movable switch member, of a switch-rod connected thereto, an extension-rod having a lost-motion connection with said switch-rod, an operating-lever connected to said extension-rod, means for retain-

ing said movable switch member in either of its operative positions, and means for maintaining said operating-lever in an initial predetermined position irrespective of the position of said movable switch member.

7. The combination with a movable switch member, of a switch-rod connected thereto, an operating-lever in mechanical relation to said switch-rod and capable of movement in at least two directions, and automatic means for returning said operating-lever to an intermediate position after movement in either direction.

8. The combination with a movable switch member, of a switch-rod connected thereto, an extension-rod having a lost-motion connection with said switch-rod, and a spring operatively related to said extension-rod to be compressed by the movement of said extension-rod in either direction and return the same to its initial position.

9. The combination with a movable switch member, of a switch-rod connected thereto, an extension-rod having a lost-motion connection with said switch-rod, two flanged sleeves slidably mounted upon said extension-rod, fixed bearing-lugs for said sleeves, a spring between said sleeves in engagement with said sleeve-flanges, and a stop-collar for each sleeve secured to said extension-rod.

10. The combination with a casing, of a movable switch member adjacent thereto, a switch-rod within said casing connected to said movable switch member, lever mechanism pivoted in coöperative relation to said switch-rod, and a spring connection between said lever mechanism and a lower portion of said casing arranged to pass over the dead-center of said lever mechanism pivot when the switch-rod is moved from one of its operative positions to another.

11. The combination with a casing, of a movable switch member adjacent thereto, a switch-rod within said casing connected to said movable switch member, pivoted arms mounted adjacent said switch-rod and connected therewith, a yoke for said pivoted arms, and a spring connection between said yoke and a lower portion of said casing arranged to pass over the dead-center of said pivoted arms pivot when the switch-rod is moved from one of its operative positions to another.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY B. NICHOLS.

Witnesses:

FRANCES HEAD,
W. C. TWINING.