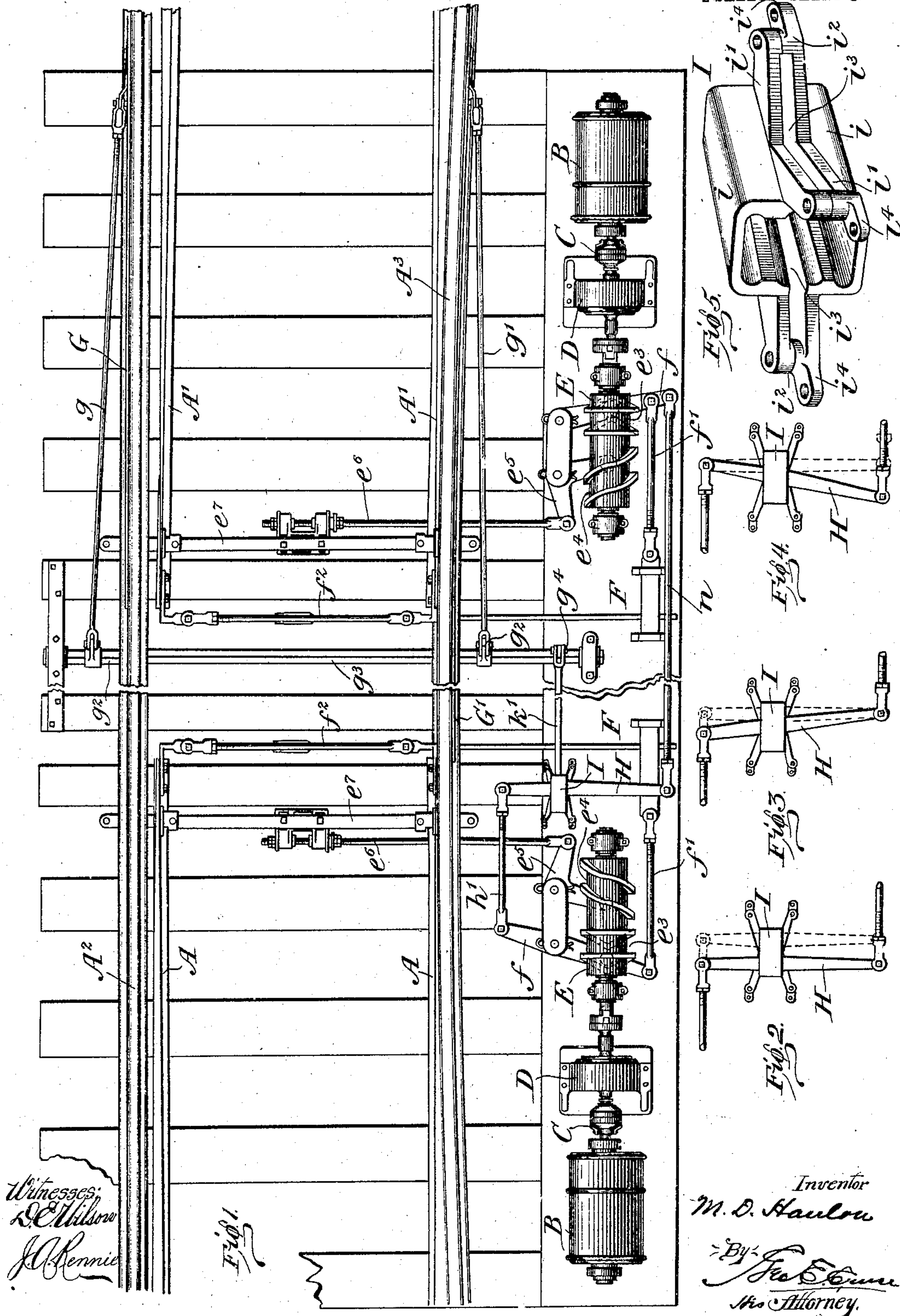


No. 791,025.

PATENTED MAY 30, 1905.

M. D. HANLON.
APPARATUS FOR MOVING SWITCH RAILS.
APPLICATION FILED FEB. 17, 1905.

2 SHEETS—SHEET 1.



Witnesses:
J. E. Gurne
J. Rennie

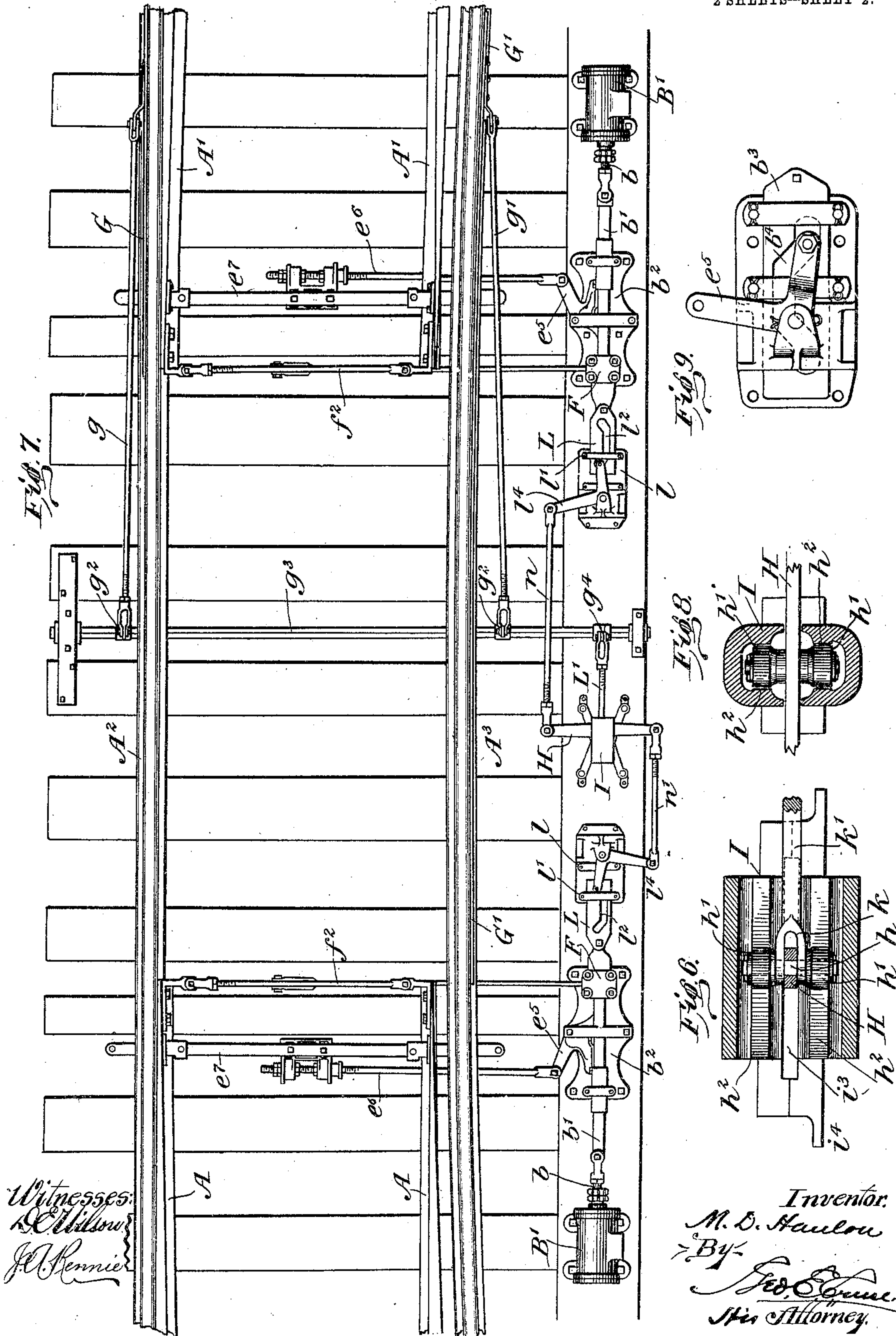
Fig. 1

Inventor
M. D. Hanlon
By J. E. Gurne
His Attorney.

M. D. HANLON.
APPARATUS FOR MOVING SWITCH RAILS.

APPLICATION FILED FEB. 17, 1905.

2 SHEETS—SHEET 2.



Witnesses:
J. A. Rennie

Inventor:
M. D. Hanlon
By: J. A. Rennie
His Attorney.

UNITED STATES PATENT OFFICE.

MARQUIS D. HANLON, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR TO
THE UNION SWITCH AND SIGNAL COMPANY, OF SWISSVALE, PENN-
SYLVANIA, A CORPORATION OF PENNSYLVANIA.

APPARATUS FOR MOVING SWITCH-RAILS.

SPECIFICATION forming part of Letters Patent No. 791,025, dated May 30, 1905.

Application filed February 17, 1905. Serial No. 246,046.

To all whom it may concern:

Be it known that I, MARQUIS D. HANLON, a citizen of the United States, residing at Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Moving Switch-Rails, of which the following is a specification.

My invention relates to apparatus for moving, shifting, or operating railway-switches and in which the motive power may be either electric or pneumatic.

I will describe a railway-switch-operating apparatus embodying my invention and then point out the novel features thereof in claims.

In the accompanying drawings, Figure 1 is a top plan view of a railway-switch-operating apparatus embodying my invention and showing it connected to two switches to be operated independently by electric motors. Figs. 2, 3, and 4 are top plan views of a floating lever and its support, showing in full and dotted lines positions the lever will assume in operating the detector-bars. Fig. 5 is a perspective view of the lever-guide. Figs. 6 and 8 are vertical sections thereof, taken at right angles to each other. Fig. 7 is a top plan view showing switch-operating apparatus embodying my invention and operated by a pneumatic motor. Fig. 9 is a bottom plan view, on enlarged scale, of the lever and cam-plate of Fig. 7 for operating the switch-rails.

Referring now to Figs. 1 and 7, A A and A' A' indicate oppositely-facing pairs of switch-rails, adapted to cooperate with the rails A² and A³ in the usual manner. According to my present invention there is an operating apparatus for moving and locking each pair of switch-rails independently, and there is one set of detector-bars for both switches, which will be operated when either one or both of the switches is operated. As shown in Fig. 1, this operating apparatus is substantially the same as that described in my prior application, upon which Patent No. 762,997, dated June 21, 1904, was granted, and comprises an electric motor B, an electric clutch C, a speed-reducing gear D, and a cam-

cylinder E, there being a separate operating apparatus for each pair of switch-rails. The cam-cylinders E have two grooves $e^3 e^4$, of which the latter operates the switch-rails through the medium of a bell-crank lever e^5 and rod e^6 , connected to the bridle-rod e^7 , joined to the switch-rails. The locking means for the switch-rail is indicated generally by F and is operated by the cam-groove e^3 through the medium of the lever f and rod f' . The locking-bar connected to the switch-rails is indicated by f^2 . The operation of all the parts of the operating apparatus so far described is the same as set forth in the said patent and need not be specifically set forth herein.

G and G' indicate detector-bars adapted to protect both switches and to be operated simultaneously no matter which of the pairs of switch-rails is moved or if both pairs are moved together. It is unnecessary to describe in detail how these detector-bars are mounted, for this, as well as the manner in which they move, is well known in the art. As shown in the drawings, they are connected by the rods g and g' to arms g^2 on a rock-shaft g^3 , so that when the shaft g^3 is rocked in one direction both detector-bars will be lifted higher than the rails A² A³, providing there is nothing to prevent their having this movement, and when the shaft is rocked in the other direction the bars will be returned to normal position, and I therefore provide some means for rocking the shaft g^3 when either or both pairs of switch-rails moves. In the present instance I have shown a floating lever H, supported to move laterally in a guide I. This guide is shown more particularly in Figs. 5, 6, and 8, and, as shown, consists of two substantially U-shaped body portions $i i$, each having two arms i' extending tangentially from each side. The two body portions are arranged so that their side edges oppose each other, and bosses i'' are formed on the arms i' to keep the side edges of the two body portions apart, and thereby forming a slot or opening i^3 between the two body portions through which the lever H extends and in which it may move laterally.

The arms of the upper part will be secured to those of the lower part in any suitable manner and the entire guide be secured to a suitable support by the feet i^4 .

5 Referring now particularly to Figs. 6 and 8, it will be seen that a bolt h passes through the lever H within the guide and that the forked end k of a rod k' straddles the lever H, and the bolt h also passes through the
10 forked end. The rod k' is thus pivotally connected to the lever H within the guide. Rollers h' are also supported upon the bolt to engage ribs h^2 on the inner surface of the guide, so that the lever H can move freely laterally,
15 but not lengthwise, in the guide. The rod k' extends through one end of the guide I and is connected to an arm g^4 on the rock-shaft g^3 . One end of the lever H is connected to the lever f of one operating apparatus by a rod
20 n and the other end to the lever f of the other apparatus by the rod n' .

Referring now to Figs. 7 and 9, B' indicates a pneumatic motor with a reciprocating piston b . I have not deemed it necessary to illustrate
25 this motor in detail nor its connections to the compressed-air reservoir or other source of supply, as these may be of any preferred type, and the mode of operation of these devices is well known. The piston is connected to a sliding bar b' , supported in suitable guides on a
30 base-plate b^2 , and this bar may cooperate with the locking-bar f^2 of the switch-rails to lock the latter, or it may operate a lock for this purpose. The bell-crank lever e^5 for moving the switch-rails is operated by a sliding cam-plate b^3 , having a cam-slot b^4 , the plate b^3 being connected to and operated by this bar b' .
35 L is a cam-plate connected to the end of the bar b' and supported to slide on a base-plate l in a guide l' . This plate is provided with a cam groove or slot l^2 , which operates the bell-crank lever l^4 , connected by a rod n or n' to the floating lever H, it being understood that each switch is provided with a duplicate
45 set of the devices just described. The cam-slot l^2 is so formed that the lever l^4 will first be moved in one direction, then remain at rest, and finally be moved back to its original position during a complete endwise movement of the cam-plate L in either direction.
50 The cam-groove e^3 on the cylinder E will also operate the lever f in the same manner during a complete revolution of the cylinder in either direction, and therefore the operation of the floating lever H will be the same with either
55 the electric or pneumatic apparatus.

The normal position of the lever H is shown in dotted lines in Figs. 2, 3, and 4. When the motor B for the switch-rails A A is operated, the lever H will first move to the position shown in full lines in Fig. 3, which will
60 rock the shaft g^3 and lift the detector-bars. The lever H will remain at rest while the switch-rails are being moved and will then return to its normal position, thereby again

rocking the shaft g^3 and lowering the detector-bars. The cam-slot b^4 in the cam-plate b^3 is so formed that while the lever H is operating the lever e^5 will not be moved. The same operation will occur in connection with the switch-rails A' A', Fig. 4 showing the position in full lines the lever H will assume to lift the detector-bars. 70

In the event the switch-rails A A and A' A' are to be moved together and both motors are operating at the same time both ends of the lever H will be moved uniformly and the lever will assume the position shown in full lines in Fig. 2. 75

When the switch-rails A A only are to be moved, the lever H will have a fulcrum at its pivotal connection with the rod n , and when the rails A' A' only are to be moved the lever H will have a fulcrum at its pivotal connection with the rod n' . 80 85

What I claim as my invention is—

1. In an apparatus for moving railway-switches, the combination of two pairs of switch-rails, two motors and connections for independently moving the respective pairs of switches, one set of detector-bars for both switches, and means for moving the detector-bars when either of said motors is operated. 90

2. In an apparatus for moving railway-switches, the combination of two pairs of switch-rails, two motors and connections for independently moving the respective pairs of switches, one set of detector-bars for both switches, and means for moving the detector-bars when either or both of said motors is operated. 95 100

3. In an apparatus for moving railway-switches, the combination of two pairs of switch-rails, two motors and connections for independently moving the respective pairs of switch-rails, a set of detector-bars common to both switches and a floating lever connected to the detector-bars and to both motors. 105

4. In an apparatus for moving railway-switches, the combination of two pairs of switch-rails, two motors and connections for independently operating the respective pairs of switch-rails, one set of detector-bars common to both switches, a rock-shaft to which the detector-bars are connected, and a floating lever, connected to the rock-shaft and to both motors. 110 115

5. In an apparatus for moving railway-switches, the combination of two pairs of switch-rails, two motors and connections for independently moving the respective pairs of switch-rails, one set of detector-bars common to both switches, a floating lever connected to the detector-bars, and connections between the lever and motors, including cams, whereby the lever is operated to lift and lower the detector-bars when either of said motors is operated. 120 125

6. In an apparatus for moving railway-switches, the combination of two pairs of 130

switch-rails, two motors and connections for independently moving the respective pairs of switch-rails, one set of detector-bars common to both switches, a floating lever connected to the detector-bars, and connections between the lever and motors, including cams, whereby the lever is operated to lift and lower the detector-bars when either or both of said motors is operated.

7. In an apparatus for moving railway-switches, the combination of two pairs of switch-rails, two motors and connections for independently operating the respective pairs of switch-rails, locking means for the switch-rails operated by said motors, one set of detector-bars common to both switches, a rock-shaft connected to the detector-bars, a floating lever connected to the rock-shaft, and connections between the said lever and both motors, including cams, whereby the detector-

bars are raised and lowered during a complete operation of either or both motors.

8. In apparatus for moving railway-switches, the combination of two pairs of switch-rails, two motors for respectively operating said pairs of rails independently, detector-bars for the switches, a floating lever connected to the detector-bars, a guide-casing for the lever in which it may move laterally but not longitudinally, and connections between said lever and both motors, whereby the operation of either motor will operate said lever to move the detector-bars.

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

MARQUIS D. HANLON.

Witnesses:

W. L. McDANIEL,

JAMES CHALMERS, Jr.