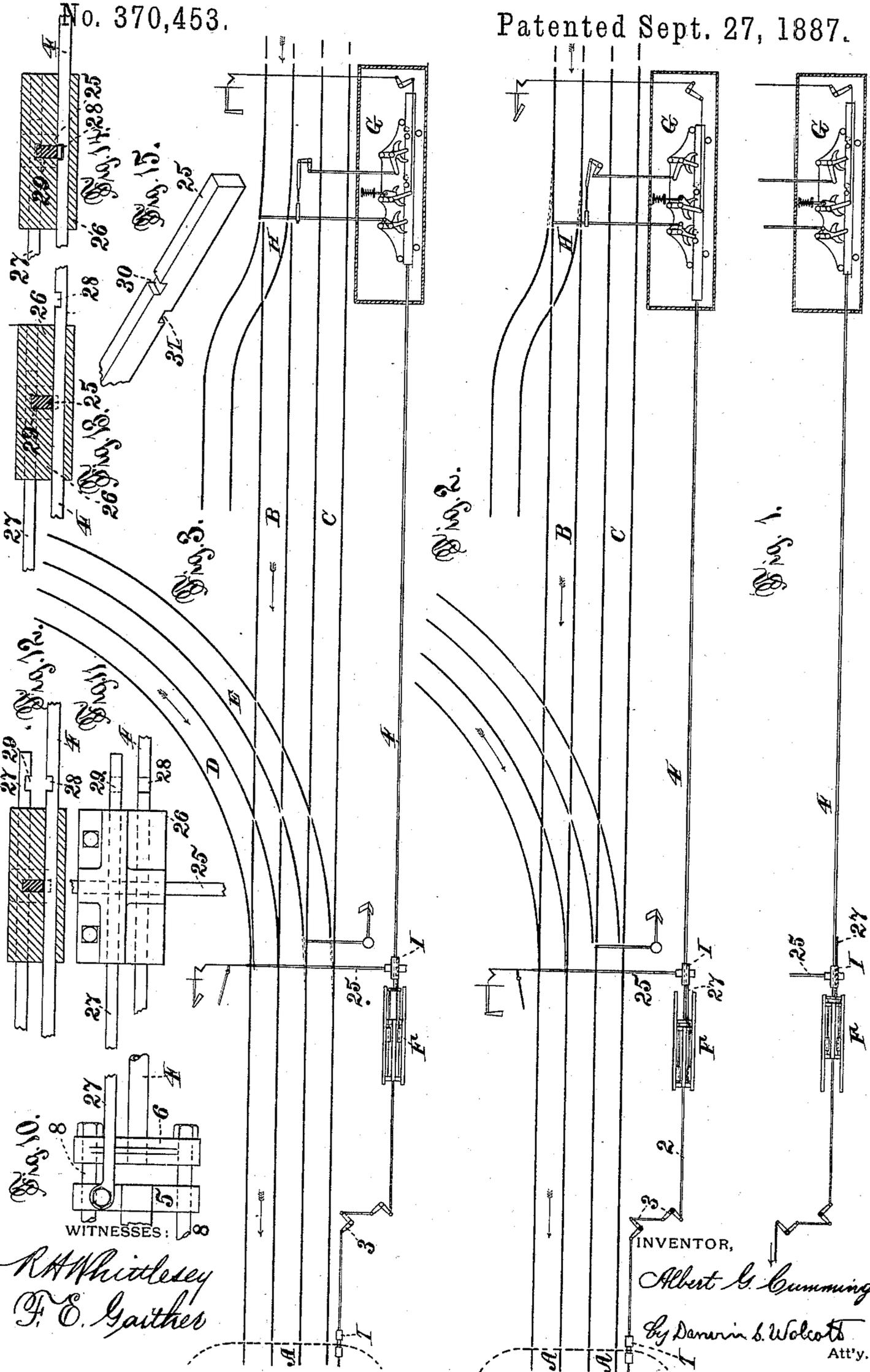


A. G. CUMMINGS.

SWITCH AND SIGNAL APPARATUS.

No. 370,453.

Patented Sept. 27, 1887.



WITNESSES:
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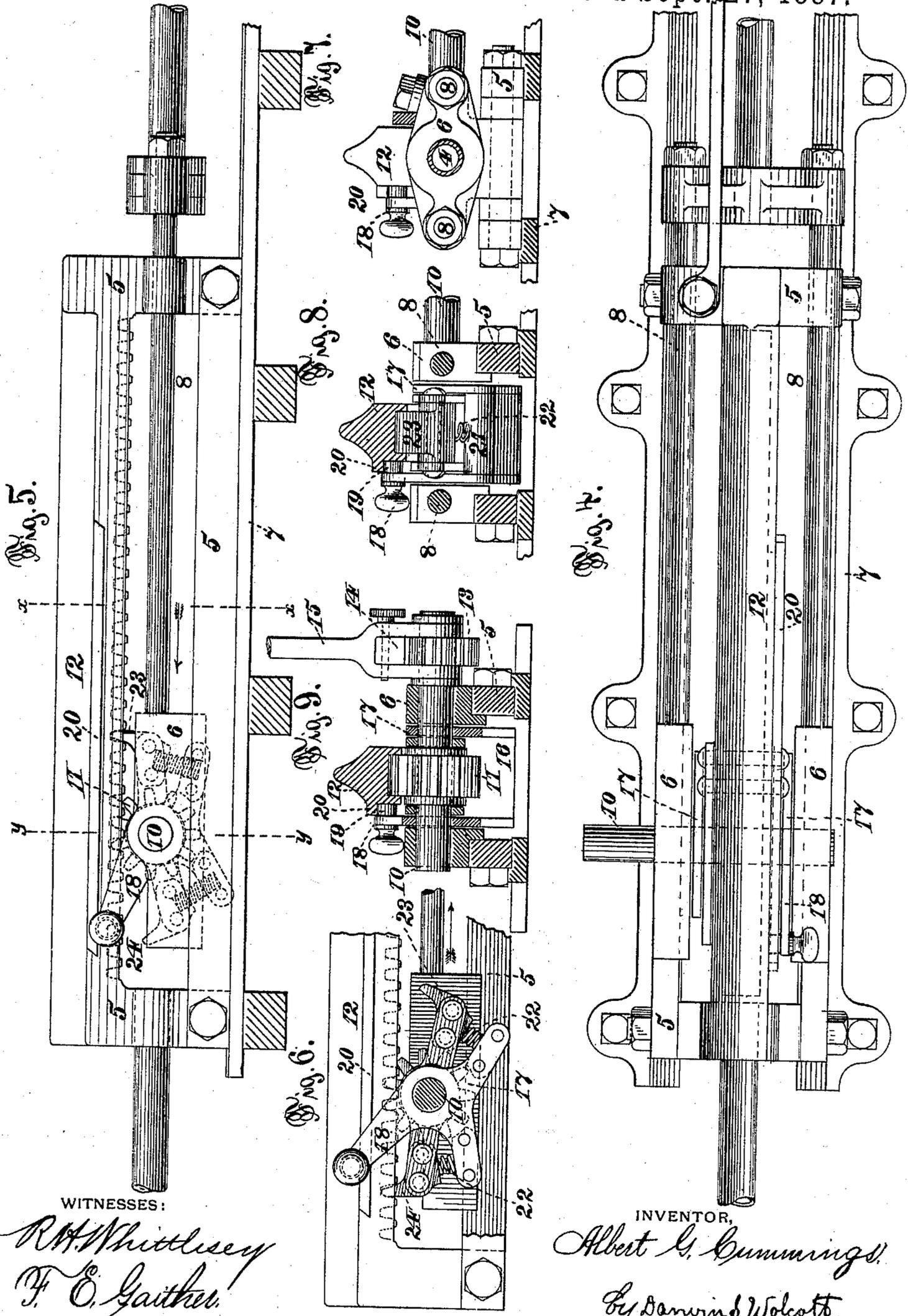
INVENTOR,
Albert G. Cummings
 By *Danvers S. Wolcott*
 Att'y.

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INVENTOR,
Albert G. Cummings
 By *Darwin Wolcott*
 Att'y.

UNITED STATES PATENT OFFICE.

ALBERT G. CUMMINGS, OF HARRISBURG, ASSIGNOR TO THE UNION SWITCH AND SIGNAL COMPANY, OF PITTSBURG, PENNSYLVANIA.

SWITCH AND SIGNAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 370,453, dated September 27, 1887.

Application filed March 31, 1887. Serial No. 233,103. (No model.)

To all whom it may concern:

Be it known that I, ALBERT G. CUMMINGS, residing at Harrisburg, in the county of Dauphin and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Switch and Signal Apparatus, of which improvements the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is a diagrammatic view illustrating the position of the several mechanisms included in my plant when the draw-bridge or movable section is unlocked. Fig. 2 is a diagrammatic view of a double-track system, with branches or sidings, showing the positions of the several mechanisms with a clear main line. Fig. 3 is a similar view when the signals and switches are set for the branches or sidings. Figs. 4 and 5 are top plan and side elevations of the mechanism for operating the switches and signals for clearing the branch lines. Fig. 6 is a detail view of a portion of such mechanism with a different adjustment of the parts. Figs. 7, 8, and 9 are end and transverse sectional views of the mechanism, the sections being taken on the lines *x x* and *y y*, Fig. 5. Figs. 10, 11, 12, 13, 14, and 15 are detail views of the interlocking connection between the switch and signal mechanism of the main lines and that of the branch lines.

In an application, No. 204,299, filed June 7, 1886, I have described and shown certain apparatus in connection with a draw-bridge or other movable track-section, whereby the movement of the device or mechanism employed for securing the draw-bridge or movable track-section in line with the main track is effective in setting such signal or signals as properly indicate the position of the movable track-section as regards the main track.

The object of the invention herein is to provide for the locking of the switch-points of a branch line or siding contiguous to the draw-bridge or movable track-section, and the preliminary setting of such signal or signals as will guard trains passing over the movable section to and from such branch or siding, such protective signals having been previously set by the locking of the movable section; and it is a further object of my invention to so construct the mechanism for operating the points

of the branch or siding that the movable section must first be locked in line with the main track and the signals for protecting trains passing along the branch or siding must be set at "danger" before such points can be set for main line and the signal governing such points can be set at "safety."

In general terms, the invention consists in the construction and combination of parts substantially as hereinafter more fully described, and claimed.

The draw-bridge or movable section A is shown at the left-hand end of Figs. 2 and 3, the two main tracks being indicated by B and C and the branch-lines or sidings by D and E. The mechanism 1, for locking the draw-bridge or movable section in line with the main track, or in normal position, is preferably similar to that shown and described in the application hereinbefore referred to, although other forms of locking devices may be employed. The above portion of this locking mechanism is connected by rods 2 and bell-crank levers 3 to the mechanism F, hereinafter more fully described, and preferably located in proximity to the point of junction of the main lines B and C and the branch lines or sidings D and E. This mechanism F is connected by a rod, 4, to the switch and signal operating mechanism G, located in proximity to the derailing-switch H, and constructed similar to the mechanism shown and described in application No. 204,299, filed by me June 7, 1886.

In the application above referred to the switch and signal operating mechanism G is so connected to the locking mechanism 1 that the unlocking of the draw-bridge or movable section A sets the signals connected with the mechanism G to "danger," and shifts the derailing-switch H for the main track B, and the locking of the draw-bridge or movable section effects a reversal of these movements. Hence, as the branch lines or sidings D E connect with the main line at a point in proximity to the draw-bridge, it is necessary, in order to protect trains moving to and from the branch lines, that the signals governing trains on the main track should be set at "danger," while the draw-bridge or movable section is locked to main line. This independent shifting of the signals is effected by the mechanism F, inserted in the connections between

the locking mechanism 1 and the mechanism G. This mechanism F consists of the two sliding frames 5 and 6, the former being mounted on suitable ways or bed-plate, 7, and connected to the rod 4, and the latter within the frame 5, and connected by the bars 8 and cross-head 9 to the rod 2. The bars 8, passing through one end of the frame 5, serve as supports and guides for the frame 6.

In the sides of the frame 6 is mounted the transverse shaft 10, having the pinion 11 secured thereon, said pinion being arranged to intermesh with the rack formed on the under side of the longitudinal brace 12 of the frame 5, (see Figs. 5 to 9;) and on the outer end of said shaft is secured the ratchet-wheel 13, with which the double pawl 14, pivoted to the lever 15, engages, said lever being loosely mounted on the shaft 10, as clearly shown in Fig. 9.

In order to insure a complete stroke or movement of the frame 6, a bridle or yoke, 16, is loosely mounted, by means of its side pieces, 17, on the shaft 10, said side pieces being located on opposite sides of the pinion 11 (see Figs. 8 and 9) and extending longitudinally of the frame on each side of the shaft. One of the side pieces is provided with an arm, 18, provided on its inner side with a stud or friction-roller, 19, adapted to engage either the upper or under side of the rib 20, formed on one side of the longitudinal brace 12. This rib is so located that when the stud 19 is above the rib 20 one of the ends of the bridle 16, whose side pieces, 17, are connected together by the cross bar or plate 21, (see Fig. 8,) is moved toward the longitudinal brace 12, the opposite end being moved away therefrom; and when the stud is below the rib the position of the ends of the bridle is reversed. The rib 20 is made of a length equal to the amount of movement of the frame 6, and is located so that the stud can be changed from the upper to the lower side thereof, or vice versa, only at the opposite limits of the stroke or movement of the frame 6.

On the cross bars or plates 21 are located springs 22, bearing at their upper ends on the under sides of the pawls 23 and 24, which are formed integral with each other, and are loosely mounted on the shaft 10. The springs are made of such a length that the pawl on the end of the bridle in closest proximity to the longitudinal brace 12 will be held in engagement with the rack on the under side of said brace—as, for example, when the stud is on top of the rib 20 the pawl 24 is caused to engage the rack, (see Fig. 6,) and when the stud is below the rib the pawl 23 engages the rack, the pawl 24 being held away, as indicated by dotted lines in Fig. 5. These pawls are constructed, when in engagement with the rack, to permit of the movement of the frame 6 in one direction only.

When the locking mechanism 1 is shifted to lock the draw-bridge or movable section—*i. e.*, from the position indicated in Fig. 1 to that in Fig. 2—the rod 2 is pulled in the direction

of the arrow, Fig. 1, thereby shifting both frames 5 and 6, they being locked together by the pinion 11, the rod 4, and switch and signal operating mechanism G, in the same direction, and setting the signals to indicate main-line “safety.”

In order to admit a train from the branch or siding D onto the main line B and across the bridge or movable section, it is necessary to set the main-line signals beyond the point of junction of the main and branch lines to “danger.” This is effected by operating the lever 15, and through it the pinion 11, in such a manner as to shift the frame or slide 6, independent of the frame 5, in the direction of the arrow in Fig. 2, thereby so shifting the mechanism G as to set the main-line signals to “danger” and the derailing-switch open to main line. As the bridge-locking mechanism has not been shifted by the above movements, a train can now be safely admitted to the main line.

In order to prevent the shifting of the branch or siding switch-points and the signal governed thereby until after the draw-bridge or movable section has been locked and the proper signals set, as above stated, and also to prevent the setting main-line signals to “safety,” and the unlocking of the bridge or movable section while the branch or siding is open to main line, I provide an interlocking device, as indicated at I, and illustrated in detail in Figs. 11 to 15.

The device consists of a rod, 25, connected to the switch-points of the siding or branch D, either directly or indirectly, and with the signal controlled by such switch-points, and extended across the rod 4, connecting the mechanisms F and G. (See Figs. 1, 2, and 3.) At the point of intersection of the rods 4 and 25 is arranged a casting, 26, having passages therethrough for the rods 4 and 25 and serving as a support for the same.

To the main frame or slide 5 is attached a rod, 27, extending out parallel with the rod 4 and passing through the opening in the casting or guide-block 26. The rods 4 and 27 are preferably arranged on opposite sides of the rod 25, and are provided with notches 28 and 29, of a width equal to the thickness of the rod 25, and of a depth sufficient to firmly engage the sides of said rod, and are located at such points on said rods as to be simultaneously in line with the rod 25 when the draw-bridge or movable section is locked in position, the derailing-switch in line with the main track, and the main-line signals at “danger,” but at no other time. In the rod 25 are formed notches 30 and 31, which will be in line with the rods 4 and 27 only when the branch or siding D is closed to main line and its signal at “danger.”

The operation of this locking device, in connection with the mechanism F, is as follows: When the locking mechanism is shifted to lock the bridge or movable section, thereby shifting the slides 5 and 6, the mechanism G, and the signals and switches connected therewith, the rod 27, connected to the frame or slide 5,

is moved so as to bring the notch 29 therein in line with the rod 25, and when the slide or frame 6 is shifted, as above stated, to set the main-line signals to "danger" and open the 5 derailing-switch, the notch 28 in the rod 4 is also brought into line with the rod 25. As the notches 28 and 29 in the rods 4 and 27 are now in line with the rod 25, the branch or siding D can now be opened and its signal set to 10 "safety." As the opening of the branch or siding shifts the notches 30 and 31 in the rod 25 out of line with the rods 4 and 27, neither of said rods can be shifted so as to either un- 15 lock the bridge or movable section or to clear the main line until the branch or siding D has been closed. As the notch 28 in the rod 4 is in line with the rod 25 when the main-line signals are at "danger," and as said signals may be at a point not visible from the branch 20 or siding, I provide the rod 27 to prevent opening the branch or siding to main line unless the draw-bridge or movable section is locked to main line. A similar interlocking device can be applied to the movable points 25 or rails and the signal of the branch E, as will be readily understood, to prevent interference between trains passing along the main line C and to and from the branch or siding E.

I claim herein as my invention—

30 1. The combination, with mechanism for locking a draw-bridge or movable section of track, of a switch and signal mechanism operated by the movement of the locking mechanism, and mechanism for shifting the switch 35 and signal mechanism independent of the locking mechanism, substantially as set forth.

40 2. The combination, with mechanism for locking a draw-bridge or other movable track-section, of a switch and signal mechanism operated by the movement of the locking mechanism, a branch or siding switch and signal

mechanism interlocking with the main-line switch and signal mechanism, and mechanism for shifting the main-line switch and signal mechanism independent of the locking and si- 45 multaneously freeing the branch switch and signal mechanism, substantially as set forth.

3. The combination, with mechanism for locking a draw-bridge or other movable track- 50 section, of a switch and signal mechanism connected therewith, and movable slides interposed between the locking and the switch and signal mechanism, substantially as set forth.

4. The combination, with mechanism for locking a draw-bridge or other movable track- 55 section, of a slide or movable frame, 5, connected therewith, a second slide or frame movable with or independent of the first slide and switch, and signal mechanism connected to the second slide, substantially as set forth. 60

5. The combination, with switch and signal apparatus and a movable track-section, of the slide or movable frame 5, the slide or mov- 65 able frame 6, mounted on the frame 5, and means for locking the frame 6 to the frame 5 and for moving it independent of the frame 5, substantially as set forth.

6. The combination of the movable frame 5, provided with the rack-bar 12, having the rib 70 20, the movable frame 6, mounted on the frame 5, the pinion mounted in the frame 6, a swinging bridle provided with an arm adapted to engage opposite sides of the rib 20, and double pawls operated by the bridle, substantially as set forth. 75

In testimony whereof I have hereunto set my hand.

ALBERT G. CUMMINGS.

Witnesses:

JNO. M. MAJOR,
EDGAR C. HUMMEL.