F. A. BAUGHMAN.

AUTOMATIC OPERATING MEANS FOR RAILWAY GATES.

APPLICATION FILED SEPT. 16, 1911.

1,044,974.

Patented Nov. 19, 1912.

3 SHEETS—SHEET 1.

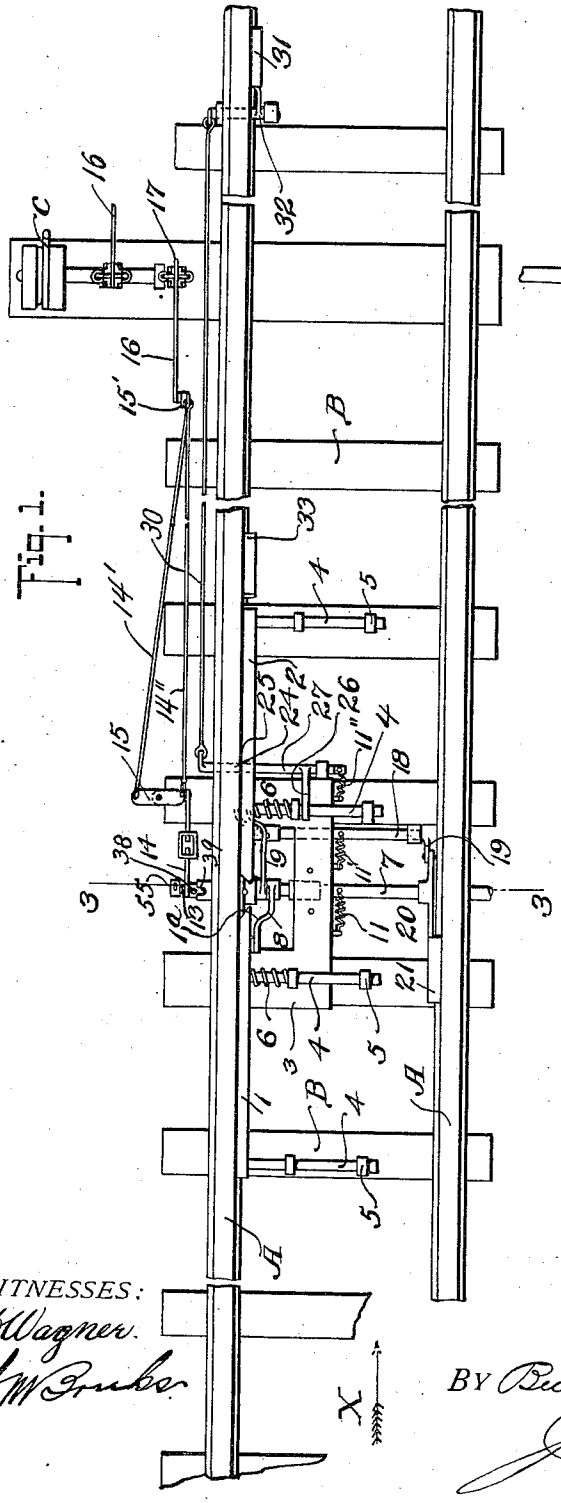

Fig. 1.

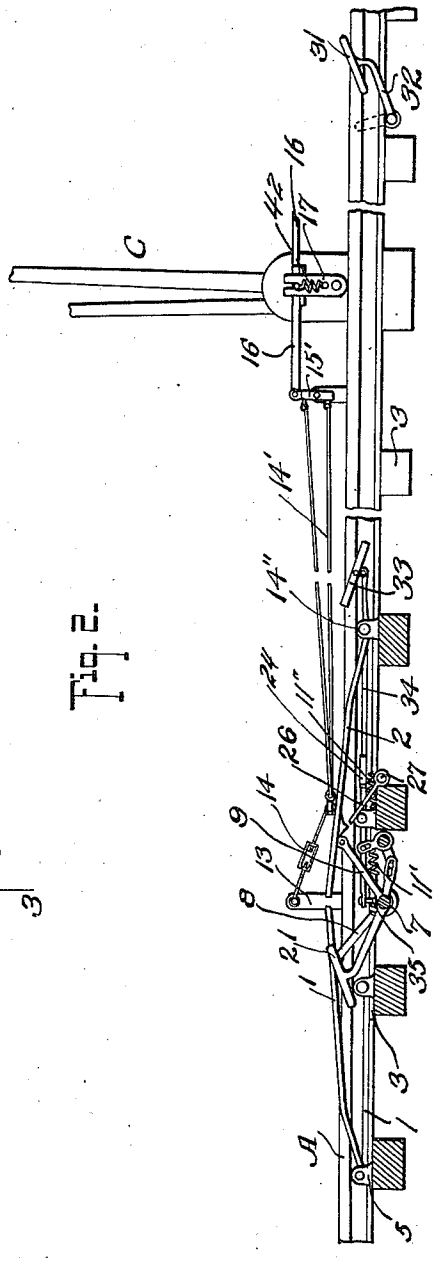

Fig. 2.

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Fig. 4.

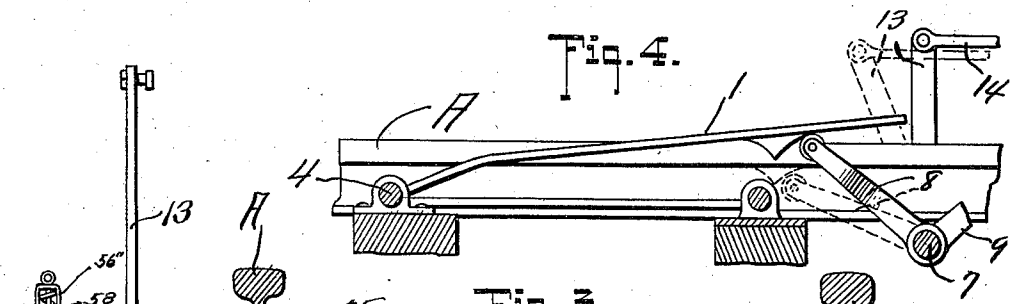


Fig. 3.

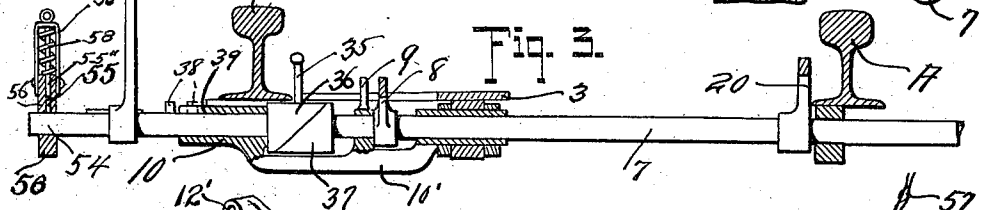


Fig. 5.

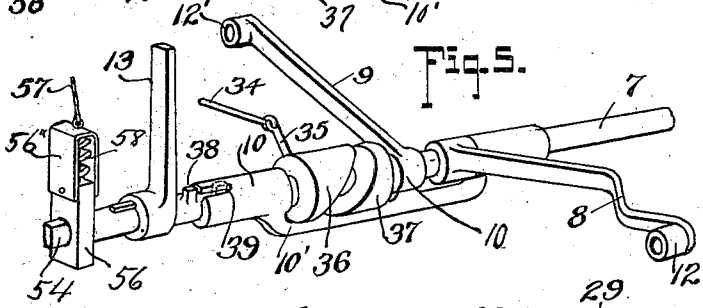
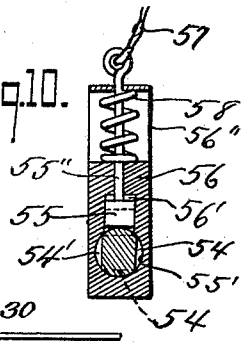


Fig. 10.



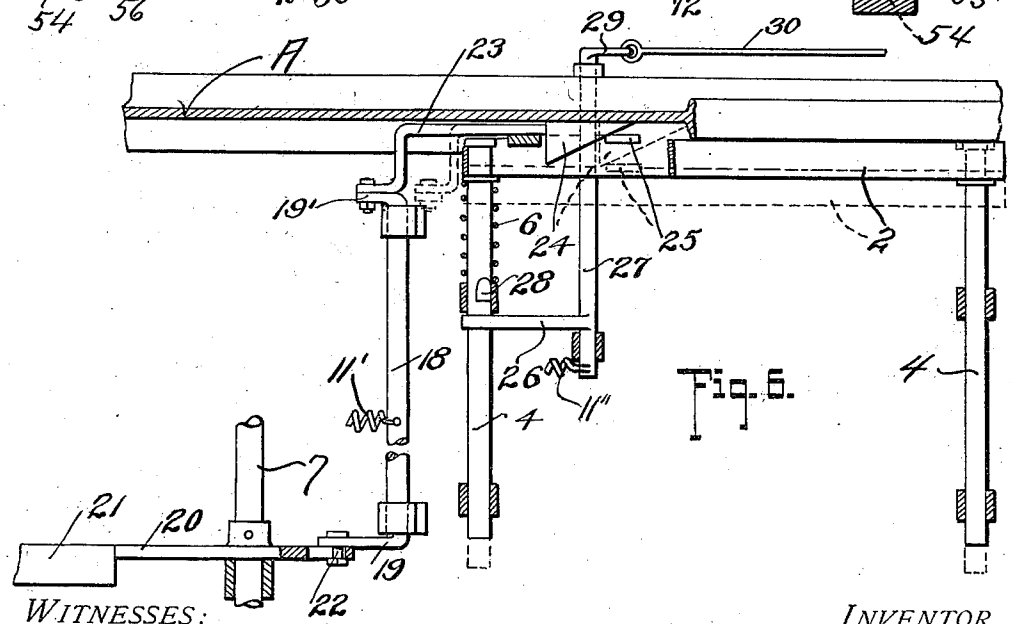


Fig. 6.

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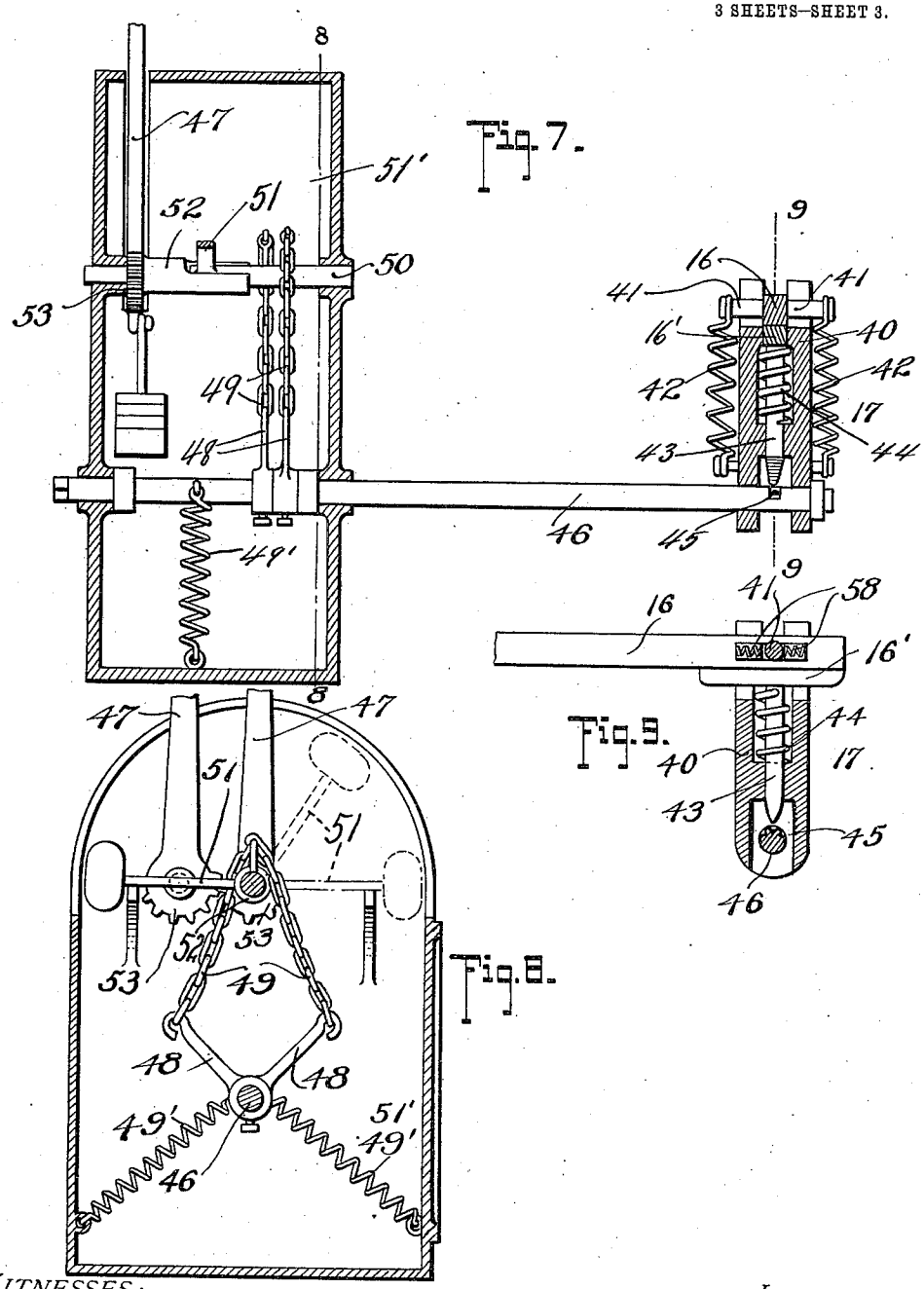
3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC OPERATING MEANS FOR RAILWAY-GATES.

1,044,974. Specification of Letters Patent. Patented Nov. 19, 1912.

Application filed September 16, 1911. Serial No. 649,640.

To all whom it may concern:

Be it known that I, FRED A. BAUGHMAN, a citizen of the United States, residing at Lima, in the county of Allen and State of Ohio, have invented certain new and useful Improvements in Automatic Operating Means for Railway-Gates, of which the following is a specification.

This invention relates to railway gates, and primarily to that class of gates which are operated by the train.

The invention comprises a series of depressible shoes or members which are located along the track a distance on each side of the crossing, which when depressed or actuated by the train passing thereover, actuate a series of shafts and levers which are operatively connected with the gates to be operated.

The invention has for one of its objects the novel mechanism which is operatively connected to a depressible member which is depressed as the train passes thereover in one direction, said mechanism being operatively connected with a second depressible member disposed adjacent to the first mentioned depressible member, and operated as the train passes thereover in a direction reverse to that when the first mentioned depressible member may be depressed.

A further object resides in a means for operatively connecting the gate operating mechanism with the second mentioned depressible member, and for rendering the connection between the first mentioned depressible member and the gate operating mechanism inoperative.

A still further object resides in the connection of the gate operating mechanism with a shaft which operates the gates to raise and lower the latter, said connection being normally inoperative whereby the gates may be manually operated.

Other objects of the invention will appear as the description thereof progresses.

For a full understanding of the present invention, reference is to be had to the following description and to the accompanying drawings, in which—

Figure 1 is a plan view showing a portion of a railway track and illustrating the mechanism comprising the invention associated operatively therewith; Fig. 2 is a vertical longitudinal sectional view, showing the parts illustrated in Fig. 1; Fig. 3 is a transverse section taken about on the line 3—3 of Fig. 1; Fig. 4 is a fragmentary sectional view bringing out more clearly the manner of engagement and extent of movement of the primary depressible member and rocker arm and other parts coöperating therewith; Fig. 5 is a fragmentary perspective view of the main rock shaft and certain parts carried thereby; Fig. 6 is a plan view showing more clearly the means for throwing the depressible device into an inoperative position and for locking the same; Fig. 7 is a sectional view bringing out more clearly the gate mechanism; Fig. 8 is a section taken about on the line 8—8 of Fig. 7; Fig. 9 is a section taken about on the line 9—9 of Fig. 7. Fig. 10 is a sectional view of the member employed to render the shaft 7 inoperative after being operated by the first wheel of the train passing thereover.

Throughout the following detail description and on the several figures of the drawings, similar parts are referred to by like reference characters.

In the drawings, A denotes the rails of an ordinary track and B the cross ties on which said rails are supported. The means in the length of the track for operating the railway gate shown at C, and which is actuated by the moving train in passing over the rails A, comprises essentially a depressible device located at one side of one of the rails A and consisting of primary and secondary independent, depressible members 1 and 2 respectively.

The depressible members 1 and 2 are angularly shaped and provided with a number of bearings through which guide rods 4 pass, said guide rods being mounted on brackets 5 secured to the ties B. The members 1 and 2 incline upwardly and toward one another, and are movable laterally with respect to the adjacent rail A. The members 1 and 2 are furthermore adapted to be depressed, being constructed of spring material so as to yield when struck by the wheels of a car. Coiled springs 6 encircle certain of the guide rods 4 and are interposed between certain of the brackets 5 and the outer sides of the depressible members, and normally tend to hold said members close to the side of the adjacent rail A. Extending transversely with respect to the track and situated below the space between adjacent terminals of the members 1 and 2 is a main rock shaft 7 on which is mounted a main rocker arm 8 and an auxiliary rocker

arm 9, the arm 8 being secured fixedly to the shaft 7 while the arm 9 is supported by a sleeve 10 normally loosely mounted on the shaft 7 and inoperative with respect thereto. A spring 11 connected with the shaft 7 tends to hold the arm 8 in a predetermined position and the latter has a roller or contact member 12 extending beneath the primary depressible member 1, a similar contact member 12′ being provided on the arm 9 and extending below the secondary depressible member 2. On one end thereof, the rock shaft 7 has fixed thereto an actuating arm 13 connected by a rod, cable, wire or similar parts 14 with the levers 15 and 15′, the latter being connected by a bar 16 with a gate operating device 17, or an equivalent part. Arranged parallel to the rock shaft 7 is a crank shaft 18 having an arm 19 at one end connected with the lower end of a lever 20 which is loosely pivoted between its ends to the shaft 7 and which carries at its upper end a depressible shoe 21 arranged adjacent to the rail A opposite that adjacent to which the parts 1 and 2 are located. The connection between the lever 20 and arm 19 is loose, as shown at 22 and the shaft 18 is provided with another arm 19′ connected with a bar 23 which slides against the inner side of the rail A adjacent to the bar 3. The bar 23 carries a wedge 24 which, when moved against a cam 25 on the bar 3, will move said bar 3 bodily away from the side of the adjacent rail A, compressing the springs 6 and, of course, forcing the depressible member 2 outwardly from the adjacent rail A, so that it will not be struck by the wheels of the rolling stock after the wheels have passed over the member 1. When the shoe 21 has been depressed and the bar 23 actuated to force the member 2 away from the adjacent rail A, one of the guide rods 4, which projects from the bar 3, is locked in the position into which it is moved by the wedge 24, by means of a catch 26 on a locking shaft 27. The shaft 27 is arranged parallel to the other shafts above described and the catch 26 consists of an arm projecting from the shaft 27 and adapted to engage in a notch 28 on the guide rod 4 just above referred to. A crank arm 29 extends from one end of the shaft 27 and is connected by a rod 30 to a depressible shoe 31 supported by an angle lever 32, the latter being located some distance down the track from the mechanism described heretofore.

A spring 11′ tends to hold the shaft 18 in its normal position and the spring 11″ tends to hold the shaft 27 in its normal position.

The connections 14″ are attached to one of the ends of each of the levers 15 and 15′ and supplemental connections 14′ connect the other ends of said levers.

Describing the general operation of the mechanism above set forth, it will be apparent that when a train or car approaches the operating means aforesaid, moving in the direction of the arrow X in Fig. 1, the wheels of the rolling stock will strike the primary depressible member 1 and by depressing said member, the rocker arm 8 will be actuated. Said member 8 being fixedly mounted on the shaft 7 will rotate the latter and move the arm 13 to the dotted line position shown in Fig. 4. Upon oscillating the arm 13, lever 15 which, through the connection 14 is operatively connected to the arm 13, and lever 15′ which is operatively connected to the lever 15 through the rods 14′ and 14″, are also oscillated about their pivots, and the bar 16 connected to the lever 15′ has imparted thereto a reciprocatory movement. When the bar 16 is reciprocated, the arm 40 is oscillated to the right, and during such movement is operatively connected to the shaft 46, in a manner hereinafter described, for operating the gates. Simultaneously with the depression of the member 1 by the rolling stock the shoe 21 is also depressed operating the lever 20 and through the pin and slot connection with the arm 19 the shaft 18 has a rotary movement imparted thereto, such movement moving or sliding the wedge 24, which is connected to the shaft 18 by the rod 23, to the dotted line position in Fig. 6. This wedge member 24 causes the cam 25 to ride thereon, and move the secondary depressible member 2 inwardly from the rail. The locking pin 26 carried by the shaft 27 drops or engages in the notch 28 formed in the guide rod 4, when the member 2 is moved inwardly, for retaining the latter in such position until the train has moved beyond the gates and depresses the shoe 31, which in turn operates the shaft 32 and through its connection 30 with the shaft 27 releases the locking pin from the notch 28 and permits the depressible member 2 to return to its normal position by the influence of the coil spring 6. After the train passes over the shoe 21 and operates the shaft 18 the latter is returned to its normal position by the spring 11′.

It is contemplated that when the mechanism above described is used on a single track, the gate actuating device 17 shall be operable by either the primary depressible member 1 or the secondary depressible member 2, for which purpose the arm 9 hereinbefore mentioned is provided on the sleeve 10. Since the sleeve 10 is normally loose on the rock shaft 7, depression of the arm 9 would not actuate the shaft 7, but means are provided for interlocking the shaft 7 with the sleeve 10 when a train approaches the operating mechanism from the direction opposite to that indicated by the arrow X shown in Fig. 1. The means just referred to consists of a setting shoe 33 which is arranged at a suitable point in the length

of one of the rails A. Said shoe 33 is connected by means of a rod 34 with an arm 35 projecting upwardly from a spiral cam 36 rotatively mounted on the shaft 7 for coöperation with a similar spiral cam 37 fixedly mounted upon the shaft 7. An interlocking lug 38 projects from the shaft 7 and is movable into a notch or slot 39 in the adjacent end of the sleeve 10. Assuming now that the train is approaching the depressible member 2 from the direction opposite to the arrow X in Fig. 1, the wheels first strike the shoe 33 exerting a pull on the rod 34 so as to turn the spiral cam 36. The turning of the cam 36 into engagement with the cam 37 causes the shaft 7 to be shifted longitudinally a sufficient extent to cause the slot 39 to receive the lug 38, thereby interlocking the sleeve 10 upon the shaft 7. The above connection is no sooner performed than the wheels strike the depressible rail 2 and force its rocker arm 9 downwardly rotating the sleeve 10 with the interlocked shaft 7 and moving the actuating arm 13 whereby to operate the gate actuating device 17.

The intermediate portion of the sleeve 10 is cut away to expose a portion of the shaft 7 upon which portion are mounted the members 36 and 37. An integral yoke 10′ connects the opposite end portions of the sleeve 10, one end portion carrying the arm 9 and the other end portion having the slot 39.

When the wheels pass over the depressed member 2, in the operation just described, the flanges of the wheels engage with the adjacent inclined end 1ª of the depressible member 1, forcing said member 1 outwardly with the bar 3 against the tension of the springs 6.

The gate operating mechanism is shown more clearly in Figs. 7, 8 and 9, and referring to the latter, the device 17 consists of a hollow arm 40, the upper portion of which is slotted to receive a transverse pin 41 by which the bar 16 is connected to the arm 40. The springs 42 normally tend to force the pin downwardly in the slot of the arm 40 and to also force the adjacent end of the bar 16 downwardly against a locking pin 43, which is vertically movable in the arm 40. A spring 44 coacts with the pin 43 to normally hold the lower end of the latter disengaged from notches 45 in an operating shaft 56 which is arranged to actuate the gate 47. The spring 44 is weaker than the springs 42—42 so that when the arm 40 is moved or oscillated by the bar 16 the latter will ride or bear on one end of the head 43′ and force the locking pin 43 into engagement with the shaft 46. It will be apparent that the bar 16 is limited in its downward movement by the action of the spring 44, the tension on the springs 42—42 being removed sufficiently, when the parts are in their normal position, to permit the spring 44 to normally retain the locking pin 43 in an inoperative position. The shaft 46 has the arms 48 attached by chains or flexible connections 49 to a weight shaft 50 in the upper portion of a casing 51′. Bearings are provided on the casing 51′ to receive the shafts 46 and 50. From the shaft 50 projects a weight arm 51, and one of the gates 47 is loosely mounted on the shaft 50 and is provided with a sleeve 52 which is slotted to permit of shifting of the arm 51 with the shaft 50 to a certain extent without operating the gate on the shaft 50.

The two gates 47 are connected for simultaneous movement by interengaging toothed segments 53 and when the member 16 is operated by the mechanism described first herein, the pull on the arm 40 will tilt said arm sufficiently to cause the bar 16 to bear downwardly on one end of the head or crosspiece 43′ of the locking pin 43 to move the latter into engagement with the notches 45 whereby the arm 40 and shaft 46 are interlocked. When the bar 16 is reciprocated the arm 40 is oscillated to the right in Fig. 9, and imparts a rotary movement to the shaft 46, an operative connection between said shaft and said arm being established by the downward pressure exerted on the pin 43 by the bar 16 when the initial oscillatory movement is given said arm. As the shaft 46 is rotated, the right hand chain in Fig. 8, which is normally taut when the gates are elevated, exerts a pull on the shaft 50 sufficient enough to bring the weight 51 from its full line position past the center of gravity as shown in the first dotted line position, whereupon the shaft 46 returns to its normal position and the weight 50 moves the gates 47 to their lowered position. When the gates are lowered and the shaft 46 is returned to its normal position, the left hand chain in Fig. 8 is taut while the right hand chain is slack. The weights remain in their lowered position until the train passes them and strikes a depressible member on the opposite side of the crossing similar to the depressible member 2 illustrated in Fig. 1, upon the operation of which the gates are raised. Referring again to Figs. 1 and 2 let it be assumed that the gates are lowered and a train is moving in a direction opposite to the arrow X. The member 33 is first struck and depressed, whereupon the rod 34 is pulled to impart a rotary movement to the cam 36, the latter being loosely mounted on the shaft 7. When the cam 36 is rotated, the cam 37 fixed on the shaft 7 is moved inwardly, bringing the lug 38 into the slot 39, whereupon any rotary movement imparted to the sleeve 10 which, it will be remembered, is loosely mounted on the shaft 7,

will operate the various parts of the mechanism as does the shaft 7 when the latter is rotated by the depression of the arm 8. So far, it will be observed, the member 33 is the only one depressed, which operation operatively connects the sleeve with the gate operating mechanism. As the train advances and depresses the member 2, the arm 9, which is carried by the sleeve 10, is depressed, and imparts to the sleeve 10 and the shaft 7 a rotary movement reversed to that imparted by the depression of the arm 8. It will therefore be obvious that the intermediate connections between the shaft 7 and the gates will be operated in a reverse manner and the arm 40 in Fig. 9 will be oscillated to the left, rotating the shaft 46, and the left hand chain 49 in Fig. 8 being taut, will rotate the shaft 50, carrying the weight from its dotted line horizontal position past the center of gravity, and then the several parts of the mechanism will return to their normal position while the weight 51 continues in its arcuate path, striking against the edge of the slot in the sleeve 52 and raising the gates.

The shaft 7 is extended through the actuating arm 13 and is provided on opposite sides with flattened portions 54 and 54′. This terminal which carries the flattened portions 54 and 54′ passes through an opening 55′ provided in the member 56. This member 56 is mounted against movement and is provided with a recess 56′ in which is slidably mounted the latch 55, the latter having secured thereto the rod 55″ passing through an aperture in the body 56 and also through the plate or cap 56″. This cap 56″ forms a housing for the spring 58 which normally tends to hold the latch 55 against the shaft 7. When the shaft 7 is rotated by a depression of either one of the members 1 and 2 the latch 55 is forced downwardly by the spring 58 on to the flattened side 54 or 54′, depending upon the direction of rotation of the shaft 7. By this construction a continued working of the several parts as the several wheels of a train pass over the members 1 and 2 will be eliminated, since the depressed member 8 or 9 is retained in its inoperative position by the catch 55 engaging the flattened side 54 or 54′. The cable 57 is fastened to the rod 55″ and passing over suitable pulleys, is connected to a shoe located at some distance along the track on each side of the gate operating mechanism and, when the shoe is depressed by the train after passing over the gate operating mechanism, releases the catch from the shaft 7 and permits the latter to return to its normal position.

The pin 41 is slidably and yieldably mounted in a slotted portion of the bar 16 and is retained in a central position relative to the slot by the springs 58. By this means, should two trains each coming in opposite directions, strike its corresponding member 1 simultaneously or approximately so, this yielding movement of the transverse pin 41 will prevent any accident to the operating mechanism.

The gates 47 are normally held in their raised position by the weight 60, but said weight yields to any movement of the gates imparted by the weight 51. The effect of the weight 51 in raising the gates, ceases when said weight rests on its bracket as shown in full lines in Fig. 8, and when the weight is at rest if the gates are not completely raised to their normal raised position, the weight 60 comes into play and causes the continued movement of said gates until the latter are in their normal raised position.

Having thus described the invention, what is claimed as new is:

1. In automatic operating means of the class described, the combination of rails, primary and secondary depressible members adjacent to one of said rails, means for actuating a railway gate, or the like, means rendering the actuating means normally operable by the primary depressible member and secondary depressible member normally inoperative with respect to said actuating means, and mechanism for rendering the secondary depressible means operative with respect to the actuating means.

2. In automatic operating means of the class described, the combination of a rail, primary and secondary depressible members in the length thereof, gate operating mechanism, an operating shaft connected with the latter, means for actuating said shaft normally operable by the primary depressible member, means normally inoperative with respect to the shaft and operable by the secondary depressible member, and means for automatically rendering the secondary depressible member operative with respect to the shaft under certain conditions of service.

3. In automatic operating means of the class described, the combination of a rail, primary and secondary depressible members in the length thereof, gate operating mechanism, an operating shaft connected with the latter, means for actuating said shaft normally operable by the primary depressible member, means normally inoperative with respect to the shaft and operable by the secondary depressible member, and means for automatically rendering the secondary depressible member operative with respect to the shaft under certain conditions of service, the primary depressible member having means whereby it will be rendered inoperative with respect to the shaft when the secondary depressible member is rendered operable with respect to the shaft.

4. In automatic operating means of the class described, the combination of a rail, primary and secondary depressible members adjacent thereto and adapted to be actuated by the wheels of passing trains, a gate operating device, means operatively connected to said device and normally operable by the primary depressible member, means inoperatively connected to said device and normally operable by the secondary depressible member, and means operable simultaneously with actuation of the primary depressible member to move the secondary depressible member away from the adjacent rail.

5. In automatic operating means of the class described, the combination of a rail, primary and secondary depressible members adjacent thereto and adapted to be actuated by the wheels of passing trains, a gate operating device, means operatively connected to said device and normally operable by the primary depressible member, means inoperatively connected to said device and normally operable by the secondary depressible member, means operable simultaneously with actuation of the primary depressible member to move the secondary depressible member away from the adjacent rail, and means for locking the secondary depressible member after it has been moved away from the rail.

6. In automatic operating means of the class described, the combination of a rail, primary and secondary depressible members adjacent thereto and adapted to be actuated by the wheels of passing trains, a gate operating device, means operatively connected to said device and normally operable by the primary depressible member, means inoperatively connected to said device and normally operable by the secondary depressible member, means operable simultaneously with actuation of the primary depressible member to move the secondary depressible member away from the adjacent rail and means for locking the secondary depressible member after it has been moved away from the rail, and means for releasing the secondary depressible member subsequent to the locking of the same,

7. In automatic operating means of the class described, the combination of a rail, primary and secondary depressible members adjacent thereto and adapted to be actuated by the wheels of passing trains, a gate operating device, means operatively connected to said device and normally operable by the primary depressible member, means inoperatively connected to said device and normally operable by the secondary depressible member, means operable simultaneously with actuation of the primary depressible member to move the secondary depressible member away from the adjacent rail, means for locking the secondary depressible member after it has been moved away from the rail, means for releasing the secondary depressible member subsequent to the locking of the same, and means for rendering the connection between the secondary depressible member and the gate actuating device operative under certain conditions of service.

8. In automatic operating means of the class described, the combination of a rail, a depressible member adjacent thereto, a rock shaft, a rocker arm extending from said shaft and operable by the depressible member, means connected to the rock shaft for actuating a gate, a second depressible member, a rocker arm normally inoperatively connected to the rock shaft and adapted to be actuated by the second depressible member, the first mentioned depressible member being adapted to actuate the rock shaft normally, and means operable by a moving train for rendering the connection between the rocker arm of the second depressible member operative preliminary to operation of the second depressible member by a train passing thereover.

9. In automatic operating means of the class described, the combination of a rail, primary and secondary depressible members, a rock shaft, rocker arms projecting from said shaft beneath the depressible members, the arm coacting with the primary depressible member being normally operatively connected to the shaft and the other arm inoperative with respect to the shaft, a depressible device connected to the secondary depressible member to move the same away from the rail when the primary depressible member is depressed, and a catch for locking the secondary depressible member after it has been moved away from the rail.

10. In automatic operating means of the class described, the combination of a rail, primary and secondary depressible members, a rock shaft, rocker arms projecting from said shaft beneath the depressible members, the arm coacting with the primary depressible member being normally operatively connected to the shaft, and the other arm inoperative with respect to the shaft, a depressible device connected to the secondary depressible member to move the same away from the rail when the primary depressible member is depressed, a catch for locking the secondary depressible member after it has been moved away from the rail, and a depressible device for releasing the secondary depressible member subsequent to movement of the same away from the rail.

11. In automatic operating means of the class described, the combination of a rail, primary and secondary depressible members, an intermediate rock shaft, rocker arms, one of which is operatively connected to the rock shaft and coacts with the pri-

mary depressible member, the other of which is inoperatively connected to the rock shaft and coacts with the secondary depressible member, a depressible device adapted to operatively connect the latter arm to the rock shaft, a locking shaft, a catch carried thereby, means connected to the secondary depressible member and adapted to be engaged by the catch, an auxiliary shaft, a wedge movable by said auxiliary shaft to force the secondary depressible member from the rail, and a depressible device connected to the auxiliary shaft for actuating the same.

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

FRED A. BAUGHMAN.

Witnesses:
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