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W. NEEB.

GATE.

No. 490,491. Patented Jan. 24, 1893.

Fig. 1.

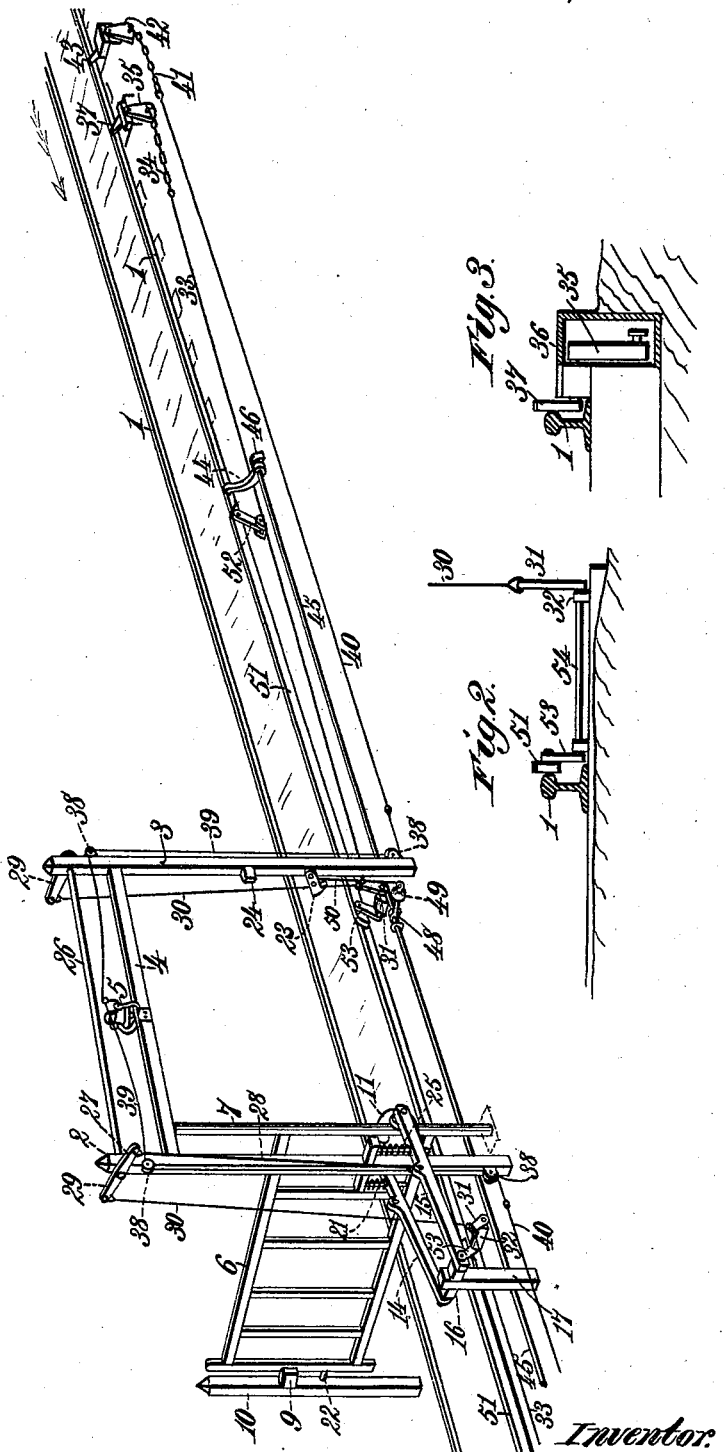

Fig. 3.

Fig. 2.

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Fig. 4

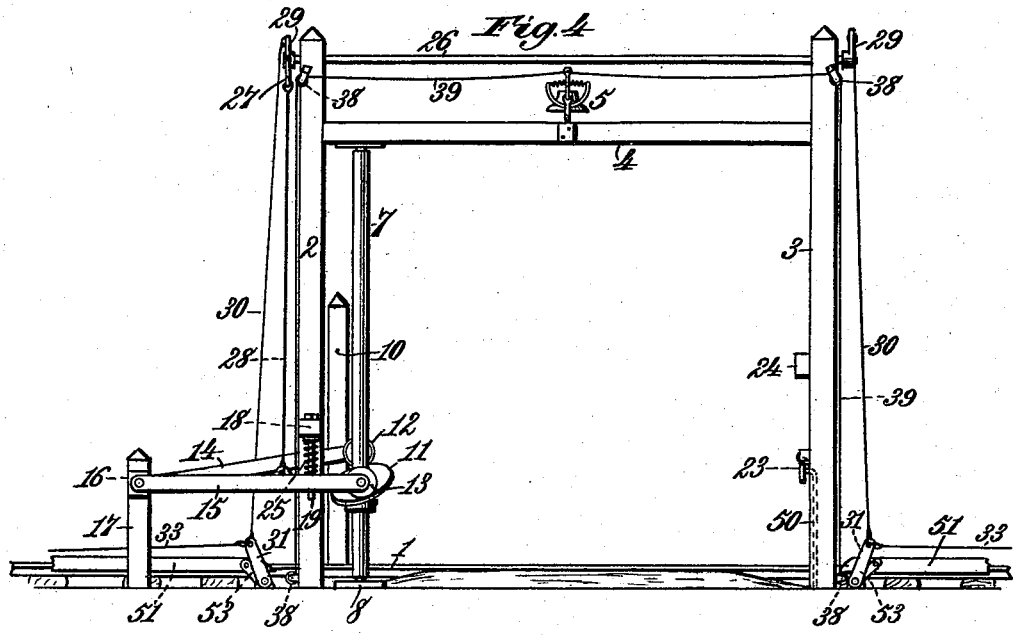
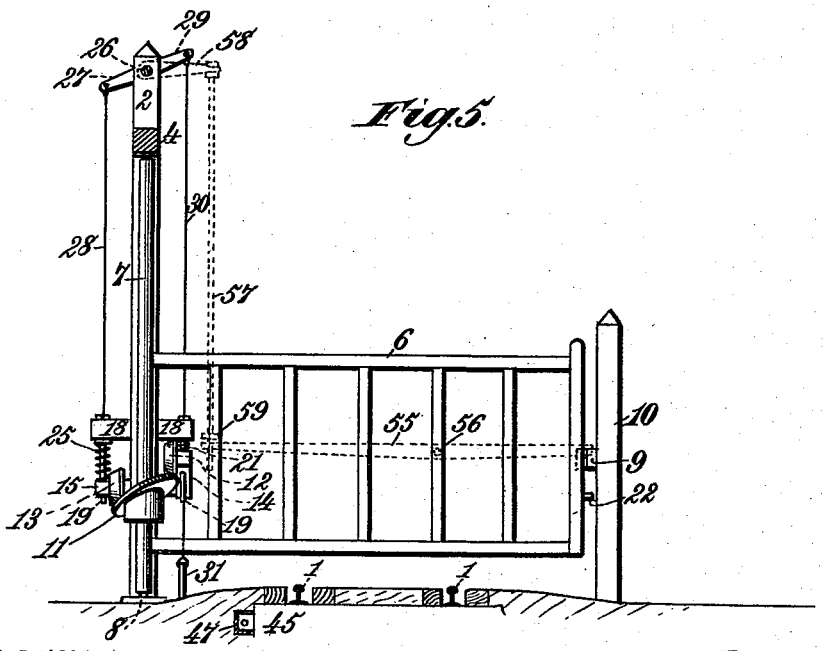


Fig. 5.



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(No Model.) 3 Sheets—Sheet 3.

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Fig. 6.

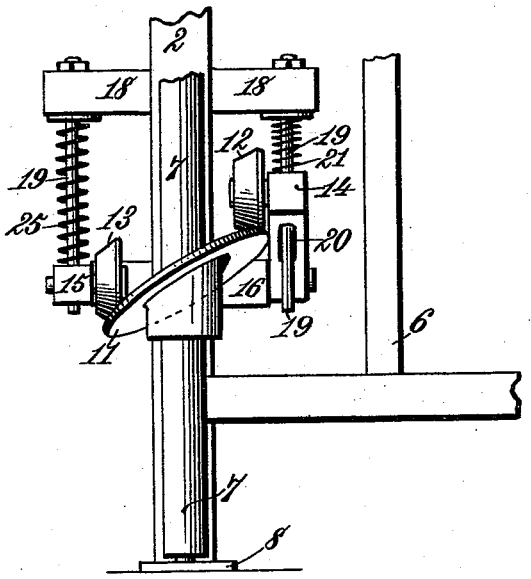


Fig. 7.

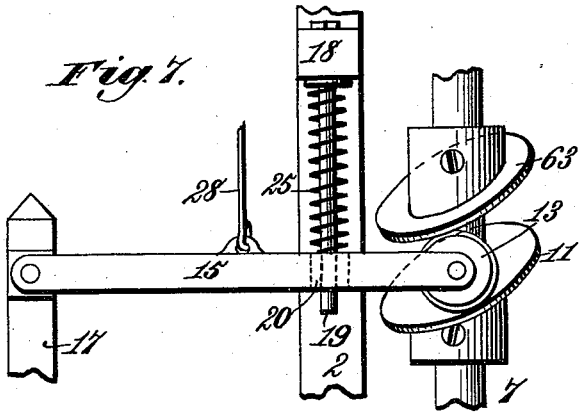
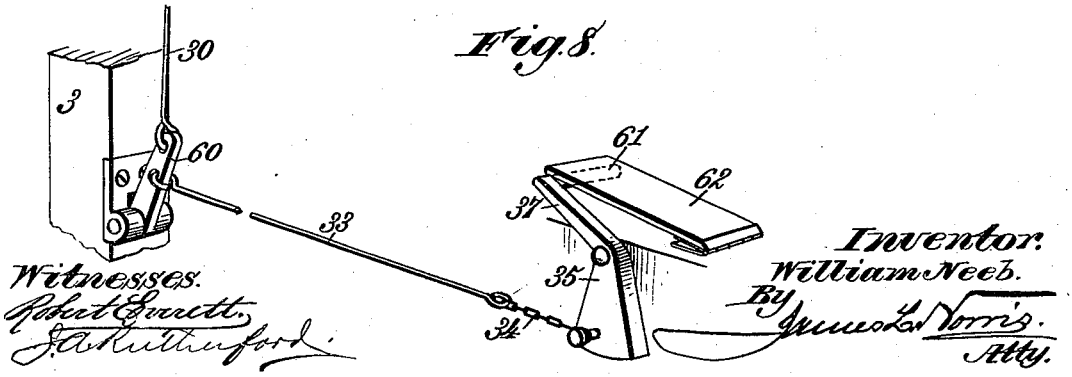


Fig. 8.



Witnesses.
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F. A. Rutherford.

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UNITED STATES PATENT OFFICE.

WILLIAM NEEB, OF BURKETT, TEXAS.

GATE.

SPECIFICATION forming part of Letters Patent No. 490,491, dated January 24, 1893.

Application filed April 13, 1892. Serial No. 429,039. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM NEEB, a citizen of the United States, residing at Burkett, in the county of Coleman and State of Texas, have invented new and useful Improvements in Automatic Gates, of which the following is a specification.

My invention relates more particularly to automatic gates for railway grade crossings, but embraces several features of construction that are also adapted for use in farm gates and automatic gates for carriage roads.

The invention consists in certain peculiarities of construction and novel combinations of parts in an automatic gate and its operating mechanism and auxiliary devices, as hereinafter described and claimed.

In the annexed drawings illustrating the invention—Figure 1 is a perspective of my improved automatic gate as arranged for use at a railway crossing. Fig. 2 is an end elevation of a portion of the gate operating mechanism in connection with the device for temporarily restraining or preventing movement of the gate after it has been unlatched. Fig. 3 is an end elevation of the trip device through which the gate is operated by a passing train. Fig. 4 is an elevation of the gateway with the gate swung across or transversely to a railway track. Fig. 5 is a partly sectional elevation at a right angle to the preceding figure. Fig. 6 is an enlarged detail view showing a portion of the gate with its immediate operating levers and their connections in end elevation. Fig. 7 is a view at right angles to Fig. 6 and illustrates a modification. Fig. 8 is a perspective showing how the trip device of the gate operating mechanism may be arranged for operation by an ordinary vehicle.

Referring to the drawings, the numeral 1 designates a railway track and 2 and 3 the main posts of a gateway erected at a railway grade crossing. In the construction shown in the drawings the posts 2 and 3 are connected near the top by a cross-beam 4 on which a bell 5, or other signal, may be supported to give warning of approaching trains or locomotives. The horizontally swinging gate 6 may be of any suitable or preferred construction and is provided with a pivotal or hinged post 7 having its upper and lower ends journaled in the cross beam 4 and in a sill 8, respectively. When erected for use at railway crossings the gate 6 may be normally closed or extended across the track, as shown in Figs. 1 and 5 and then engages a lug or catch 9 on a post 10 at the farther side of the track or tracks. While extended in this position across the track or tracks the gate 6 will serve as a stock-guard to prevent the passage of cattle onto the tracks, from the intersecting carriage road. It is obvious that a similar gate may be located on each side of the railroad in position to be normally closed or extended across the tracks, one gate on each side of the carriage road, and so form an effective stock guard in both directions.

On the pivotal post 7 of the gate 6 is secured an inclined cam disk 11 which as shown in Figs. 4 and 6 is arranged in bearing contact with friction rollers 12 and 13 on the ends of oppositely oscillatory levers 14 and 15 that are pivoted to cross-arms 16 supported by a post 17 adjacent to the post 2 of the gateway. The post 2 may be provided with cross-arms 18 from the ends of which are suspended guide pins 19 that extend through slotted openings 20 in the oscillatory levers 14 and 15, as shown. On the guide pin 19 that connects with the oscillatory lever 14, nearest the track, is preferably placed a coiled spring 21 of sufficient strength or tension to force down the lever 14 and cause its roller 12 to bear on the upper part of the cam 11 with such power as to rotate the cam post 7 and thereby throw or swing the gate parallel with the railway track when the cam is relieved from the pressure of the roller 13 carried by the other oscillatory lever 15, as hereinafter explained. When the gate 6 is thus swung parallel with the track a catch or lug 22, Figs. 1 and 5, will come into locking engagement with a pivoted catch 23, Figs. 1 and 4, on the post 3 of the gateway. This post 3 may be provided with a stop 24 to limit the movement of the gate and insure the proper engagement of the catches 22 and 23 so as to cause the gate to remain in the necessary position to obstruct the passage of vehicles or pedestrians onto the railway tracks while a train is approaching the crossing. In the construction shown, the guide pin 19 that connects with the oscillatory lever 15, farthest from the railway track may support a coiled

spring 25 which should be of greater strength or tension than the spring 21 in order to overcome the power exerted by said spring 21 and press the roller 13 downward against the cam 11 with such force as to swing the gate 6 backward across the track when unlatched and released from the post 3, which, as hereinafter explained will be accomplished automatically by the passage of the train past the crossing.

The upper ends of the posts 2 and 3, on opposite sides of the carriage road, support a rock-shaft 26 having an arm 27 to which is attached one end of a rod 28 that connects, at its other end, with the oscillatory lever 15 that acts to swing the gate 6 across or transversely to the track, when unlatched or released. Through this rod 28, when the shaft 26 is rocked in the proper direction, the oscillatory lever 15 will be raised against the tension of its spring 25, thereby relieving the cam 11 from the pressure of the roller 13 and permitting the oscillatory lever 14 and roller 12 to act on said cam, under the pressure of the spring 21, and thus swing the gate parallel with the railway track and across the carriage road.

On one or both ends of the rock-shaft 26 is an arm 29 for attachment of one end of a rod 30 the other end of which is connected to a lever 31 that is pivotally supported in a vertically inclined position, Figs. 1 and 4, in a suitable bearing 32 Fig. 2 at one side of the railway track and adjacent to the gateway. To the upper end of this lever 31 is attached a rod 33 which is connected by a chain 34 with the lower end of one arm of a crank shaped trip lever 35 that is preferably housed in a suitable casing 36, Fig. 3, at one side of the track. The lever 35 is preferably made heavy or weighted at its lower end and is provided next to the track with a trip arm 37 that normally projects upward close to the outer side of one of the rails in position to be depressed or tilted by contact with the tread of one of the forward wheels of a locomotive. The lever 35 with its trip-arm 37 should be located several hundred feet or yards from the railway crossing, or at a sufficient distance to afford ample time for the automatic swinging of the gate 6 from across the track to a position parallel therewith before the forward end of the train reaches the crossing. It will be seen that a locomotive approaching the crossing in the direction of the arrow shown in Fig. 1 will depress or tilt the trip arm 37 and swing the lower part of the lever 35 in such direction as to draw on the chain 34 and rod 33 in such a manner as to draw down the lever 31 and through the rod 30 and rock-shaft arm 29 cause the rock shaft 26 to rock toward the track. By this movement of the rock-shaft 26 its arm 27 is swung upward thereby drawing on the rod 28 so as to raise the oscillatory lever 15, relieve the pressure of its roller 13 on the cam 11, and thus enable the opposite oscillatory lever 14 and roller 12 to exert sufficient power on the cam 11 to swing the gate from across the railway track and carry it into locking engagement with the latching devices on the post 3 of the gateway that extends across the carriage road. It will be observed that by reason of the flexible or chain connection 34 between the rod 33 and lever 35 any action upon or movement of the trip 37 by a train receding from the crossing will have no effect on the gate operating mechanism.

The main posts 2 and 3 of the gateway may be provided at top and bottom with pulleys 38 for passage of cords 39 each of which may connect with a rod 40 which, in turn, is connected by a short chain 41 into a weighted lever 42 having a trip arm 43 projecting upward close to the outer side of a track-rail in position to be depressed by pressure from the tread of a locomotive or car wheel. The cords 39 are connected with the bell 5 or other signal so that warning of an approaching train will be given as soon as the trip arm 43 is depressed or tilted in the proper direction to draw on the chain 34 and its connections with the signal. It is obvious that the cords 39 may be arranged to operate a visual signal, if preferred, instead of a bell or other audible signal. A train receding from the crossing will tilt the trip arm 43 in such direction as to slacken the chain 41, so that the signal will not then be actuated. The trip 43 for actuating the signal and the trip 37 for operating the gate are preferably so arranged, at a suitable distance from the crossing, that a train approaching the crossing will first depress the trip 43 and swing the lever 42 in such direction as to cause the signal to give a warning. The forward movement of the train toward the crossing next actuates the trip 37 in such manner as to operate the lever 31, rock shaft 26 and oppositely oscillatory levers 14 and 15 so as to swing the gate 6 from across the track and into latching engagement with the post 3, as already described. Just before the train reaches the gate, which is now parallel with the track, the tread of one of the forward wheels comes in contact with and depresses an arm 44 on a rock shaft 45 that is supported in suitable bearings 46 outside and slightly below one of the rails. This rock shaft 45 is arranged parallel with the track, as shown in Fig. 1, and may be inclosed in a housing 47 as shown in Fig. 5. On the rock shaft 45, adjacent to the gateway, is an arm 48 carrying a weight 49, and this weighted arm 48 is connected by a vertical rod or extension 50 with the pivoted catch 23 by which the gate is latched when thrown parallel with the track. It will be seen that the weight 49 on the arm 48 will pull down and hold the rock shaft 45 and rod 50 in such position as to hold the pivoted catch 23 in locking engagement with the catch 22 on this gate 6 as long as the arm 44 is free from pressure. When the wheel of a passing car or locomotive depresses the arm 44 and thereby rocks

the shaft 45 the arm 48 and rod 50 will raise the pivoted catch 23 from its engagement with the catch 22 and the gate would then automatically swing back across the track or transversely thereto, were it not for the restraining influence of certain mechanism that is arranged to prevent the swinging of the gate across the track until after the train has wholly passed the crossing.

The restraining mechanism for holding the gate 6 parallel with the track after the catches 22 and 23 have been disengaged, as above described, and while the train is still passing the crossing, consists of a supplemental rail 51 pivotally supported at its opposite ends, outside one of the track-rails, on pivoted levers 52 and 53 one of which, as 53, is connected to and moves with the pivotal portion 54, Fig. 2, of the gate operating lever 31 heretofore described. Immediately after the forward wheel of a train approaching the crossing has depressed the rock shaft arm 44 and actuated the devices that unlatch the gate the said wheel will pass onto the supplemental rail 51, and hold the same down. This supplemental rail should be of such length that during the passage of a train there will always be at least one wheel on said rail, which is thus continually held down until the train has entirely passed the crossing. As long as the supplemental rail 51 is thus held down its supporting levers 52 and 53 and connected gate lever 31 will necessarily remain in a depressed position and the rod 30 will continue to draw down on the arm 29 on the rock-shaft 26 thereby holding the rock-shaft arm 27, rod 28 and lever 15 in an elevated position so that the roller 13 will exert no pressure on the cam 11, and thus the downward pressure exerted on the cam by the opposite roller 12 of the lever 14 will hold the gate parallel with the track until the train has passed. When the train is clear of the crossing the tension or strength of the spring 25, being greater than that of the spring 21, will force down the lever 15 and cause the roller 13 to bear forcibly on the cam 11 in such a manner as to swing the gate transversely to the track. At the same time the rock-shaft arm 27 is pulled down and the opposite rock-shaft arm 29 is correspondingly raised so that through the connections thereto the levers 31, 35, 52 and 53 will be restored to their former positions, with the supplemental rail 51 slightly elevated above the track. The trip arm 37 may be pivotally connected to a rail like the supplemental rail 51 for a purpose similar to such rail, *i. e.* to afford a lengthened bearing surface for the car wheels.

It is obvious that the several devices above described for actuating the signal, the gate, the unlatching mechanism and the restraining mechanism for holding the unlatched gate parallel with the track can be easily and conveniently duplicated on both sides of the crossing in position to be operated by trains from both directions. It is also obvious that where there are several parallel railway tracks the devices described can be arranged at one side of each track and be connected by suitable transverse rods or shafts so that the gate or gates can be actuated by a train passing in either direction on any one of the tracks.

I do not confine myself to a single gate operating as described, nor do I confine myself to arranging the gate to swing across the track and further I do not confine myself to springs for moving the levers 14 and 15.

In Fig. 5 I have shown an automatic latching and unlatching mechanism that can be conveniently applied to either a railway gate or a farm gate. This latch consists of a bar 55 pivoted at 56 and extended transversely for nearly the entire width of the gate. One end of this latch bar 55 is adapted to automatically engage a catch 9 on the post 10 and the other end of said latch bar is perforated by a rod 57 depending from an arm 58 on the rock-shaft 26 that connects with the gate operating mechanism as before described. On the rod 57 just above the pivoted latch bar 55 is a collar or shoulder 59 by which the latch bar is tilted and disengaged from the catch 9 when the rock-shaft 26 is rocked to operate the gate and cause it to swing automatically to its other position.

For special application to farm gates I may pivot a lever 60, Fig. 8, near the base of a post 3 and connect said lever by a rod 30 to the rock-shaft arm 29 before described. The lever 60 will also be connected by a rod 33 and chain 34, like those already described, to a weighted trip lever 35 located in the road bed at some distance from the gate. The trip arm 37 of this lever 35 will have a horizontal stud or bar 61, Fig. 8, projecting laterally beneath one end of a hinged board 62 arranged in the road at a suitable point to be acted on and depressed by the wheel of a vehicle approaching the gate. The act of depressing the hinged board 62 will operate the gate in the same manner as already described with reference to the trip 37 adjacent to the railway track.

Instead of employing two oppositely oscillatory levers 14 and 15 for immediately operating the gate I may dispense with the lever 14 and use only a single oscillatory lever 15, as shown in Fig. 7. In this event the pivotal post 7 of the gate will be provided with two inclined cams 11 and 63 and the roller 13 carried by the lever 15 will be arranged between said cams and in contact with both so as to operate the gate in either direction. When swinging the gate one way the roller 13 will be drawn up in bearing contact with the upper cam disk 63 by the traction of the rod 28 and when the traction on the rod 28 is released the roller 13 will be forced by the weight of the lever 15, or by the tension of the spring 25, into bearing contact with the lower cam disk 11 and so swing the gate in the opposite direction.

It will be observed that my invention as

applied to automatic gates at railway grade crossings provides simple and efficient means for giving warning of the approach of trains before the gates are swung across the street or carriage road so that with ordinary care there is no liability of vehicles or pedestrians being caught upon the tracks, between the closed gates. After the gates are automatically closed, parallel with the tracks, they remain locked or latched until the train reaches the crossing and then, though automatically unlatched in readiness for being swung in the proper direction to clear the carriage road, they are held or restrained temporarily from swinging out of line with the tracks until the train has entirely passed and the carriage road again made safe.

I would have it understood that the several trip devices and the supplemental rail 51 of the gate restraining mechanism may be arranged at either the inner or outer side of either track rail, as may be found most convenient.

What I claim as my invention, is:—

1. In an automatic gate for railways or carriage roads, the combination with a gate having a post provided with an inclined cam disk, of a spring actuated lever having a roller in bearing contact with said cam, a rock-shaft, a rod connecting said lever with an arm on the rock-shaft, and mechanism connected with the rock-shaft and adapted to be actuated from a distance to cause the said lever and its roller to operate on the cam and swing the gate, substantially as described.

2. In an automatic gate for railways or carriage roads, the combination with a gate having a post provided with a cam, of a spring actuated lever having a roller in bearing contact with the cam on said post, a rock-shaft provided with oppositely projecting arms, a rod connecting said lever with one of the arms on said rock-shaft, a lever pivoted at or near the level of the road, a rod connecting said lever with the other arm of the rock-shaft, a trip device located in the road or adjacent to a railway track rail, and a rod and chain connecting said last named lever with the trip device, substantially as described.

3. In an automatic gate for railways or carriage roads, the combination with a gate having a post provided with an inclined cam disk, of oppositely oscillatory levers having rollers in bearing contact with said cam, an elevated rock-shaft provided with oppositely projecting arms, a rod connecting one of said oscillatory levers with one of the rock-shaft arms, and a tripping mechanism located at a distance from the gate and connected with another arm of the rock-shaft, substantially as described.

4. In an automatic gate for railway grade crossings, the combination of a gateway parallel with the railway track, a gate having a post provided with an inclined cam disk, oppositely oscillatory levers having rollers in bearing contact with said cam, a rock-shaft supported on the gateway above the gate and provided with oppositely projecting arms, a rod connecting one of said oscillatory levers with one of the rock-shaft arms, a lever pivotally supported adjacent to the gateway, a rod connecting said lever with another rock-shaft arm, and a trip device located adjacent to the side of one of the track rails at a distance from the crossing and connected with said last named lever, substantially as described.

5. In an automatic gate for railway grade crossings, the combination of a gate having a post provided with an inclined cam, a lever having a roller for acting on said cam, a rock-shaft supported on the gateway above the gate and provided with oppositely projecting arms, a rod connecting said lever with one of the rock-shaft arms, a lever pivotally supported adjacent to the gateway a rod connecting another one of the rock-shaft arms with said lever, a trip device located adjacent to the side of one of the track rails at a distance from the crossing and connected with said last named lever, a latching device on one of the posts of the gateway, a rock-shaft located parallel to the track and having at one end a trip arm and at its other end a weighted arm, and a rod connecting said weighted arm with the latching device to unlatch the gate when the trip arm of the rock-shaft is depressed by a passing train, substantially as described.

6. In an automatic gate for railway grade crossings, the combination of a gate, provided with an operating lever, a rock-shaft supported above the gate and provided with oppositely projecting arms, a rod connecting one of said rock-shaft arms with the gate operating lever, mechanism for automatically latching and unlatching the gate, a lever pivotally supported adjacent to the lower part of the gateway, a rod connecting said lever with one of the rock-shaft arms, a trip device located at the side of one of the track rails at a distance from the crossing, a rod and chain connecting said trip device with the lever adjacent to the lower part of the gateway, and mechanism located adjacent to the railway track and connected with said last named lever to restrain or prevent movement of the gate after it has been unlatched and until the train has passed the crossing, said restraining mechanism being controlled by the passing train substantially as described.

7. In an automatic gate for railway grade crossings, the combination with a gate adapted to swing horizontally across the railway track and having a catch, and a gate post having a movable catch to engage and disengage the catch on the gate, of a trip device located adjacent to the side of one of the track rails at a distance from the crossing and connected with the gate operating lever mechanism, a rock-shaft extending longitudinally beside one of the track rails and provided at one end with a trip arm and at its other end with a weighted arm connected with the catch on the

gate post, and a pivotally supported supplemental rail located at the side of one of the track rails and connected with one of the levers of the gate operating mechanism to restrain movement of the gate after it has been unlatched and until the train has passed the crossing, said restraining mechanism being controlled by pressure of a passing train on the said supplemental rail, substantially as described.

8. In an automatic gate for railway grade crossings, the combination of a gateway, a gate having a post provided with a cam, a lever adapted to act on said cam to swing the gate, a rock shaft supported above the gate and provided with oppositely projecting arms, a rod connecting one of said arms with said lever, automatic latching mechanism, a rock-shaft located at the side of one of the track-rails and provided at one end with a trip arm and at its other end with an arm that is connected with the latching mechanism to automatically unlatch the same when the trip arm is depressed by a passing train, a supplemental rail supported on pivotal levers at the side of one of the track rails and adapted to be depressed and continuously held down by a passing train to restrain or prevent movement of the gate after it has been unlatched and until the train has passed the crossing, a a lever 31 connected with one of the levers or pivotal supports of said supplemental rail, a rod connecting said lever 31 with one of the arms of the rock-shaft supported above the gate, a trip device located at the side of one of the track rails at a distance from the crossing, and a rod and chain connecting the lever 31 with said trip device, substantially as described.

9. In an automatic gate, the combination of the gate 6 having a pivotal post 7 provided with a cam 11, the oppositely oscillatory levers 14 and 15 having rollers 12 and 13 adapted to act on said cam to swing the gate in opposite directions, the rock-shaft 26 having arms 27 and 29, the rod 28 connecting the arm 27 and lever 15, the lever 31, the rod 30 connecting said lever with the rock shaft arm 29, the weighted lever 35 located at a distance from the gate and provided with a trip arm 37, and the rod 33 and chain 34 connecting said levers 31 and 35, substantially as described.

10. In an automatic gate, the combination of the posts 2 and 3 one of which is provided with a latch 23, the gate 6 having a post 7 provided with a cam, a lever 15 having a roller adapted to act on said cam, the rock shaft 26 provided with arms 27 and 29, the rod 28 connecting the lever 15 and rock shaft arm 27, the lever 31, the rod 30 connecting said lever with the rock shaft arm 29, the weighted lever 35 located at the side of a railway track rail at a distance from the gate and provided with a trip arm 37 adapted to be depressed or tilted by a passing train, the rod 33 and chain 34 connecting said levers 31 and 35, the rock shaft 45 supported at the side of one of the track rails and provided at one end with a trip arm 44 and at its other end with an arm 48, a rod 50 connecting said arm 48 with the latch 23 to unlatch the same when the trip arm 44 is depressed by a passing train, and the supplemental rail 51 having pivotal supports 52 and 53 one of which is connected with the lever 31, said supplemental rail being adapted to be depressed and held down by a passing train to restrain or prevent movement of the gate after it has been unlatched and until the train has passed the gate, substantially as described.

11. In an automatic gate, the combination of the gate 6 provided with operating levers and automatic latching and unlatching mechanism, a trip device 37 located at the side of a railway track rail in position to be operated by a passing train and connected with the gate operating mechanism, a signal supported at or near the gate, a trip device 43 connected with said signal and located adjacent to the track in position to be operated before the gate operating mechanism is set in motion, and a supplemental rail 51 pivotally supported adjacent to one side of the track and connected with the gate operating mechanism for the purpose of restraining or preventing movement of the gate after it has been unlatched and until the train has passed, substantially as described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

WILLIAM NEEB. [L. S.]

Witnesses:
JAMES A. RUTHERFORD,
J. HARRY DALY.