Nov. 8, 1927. 1,648,691

T. A. MATTHEWS

AUTOMATIC GATE

Filed Oct. 28, 1925 3 Sheets-Sheet 1

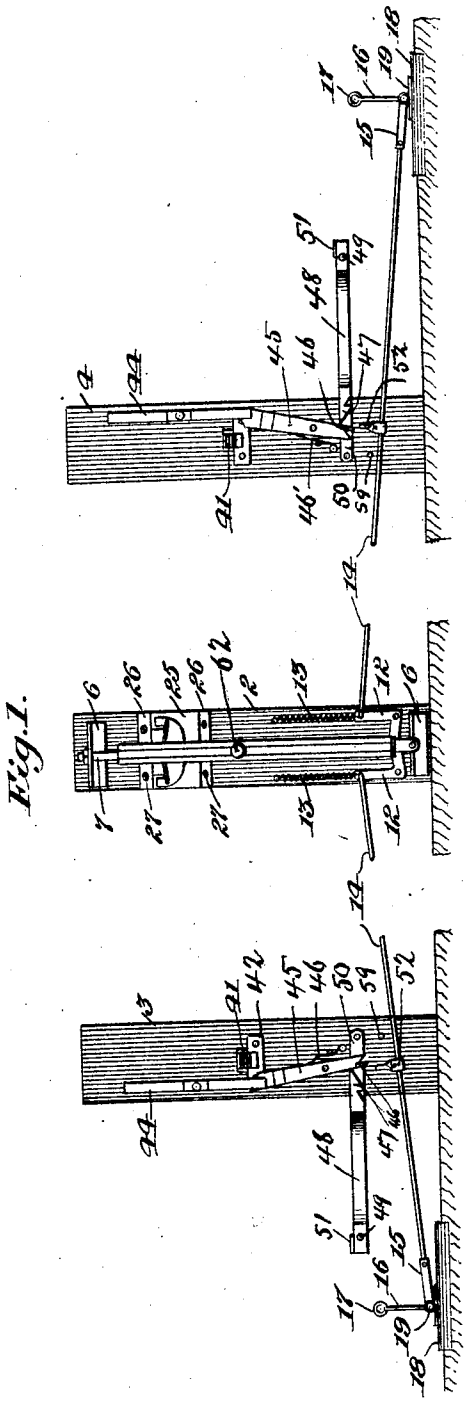


Fig. 1.

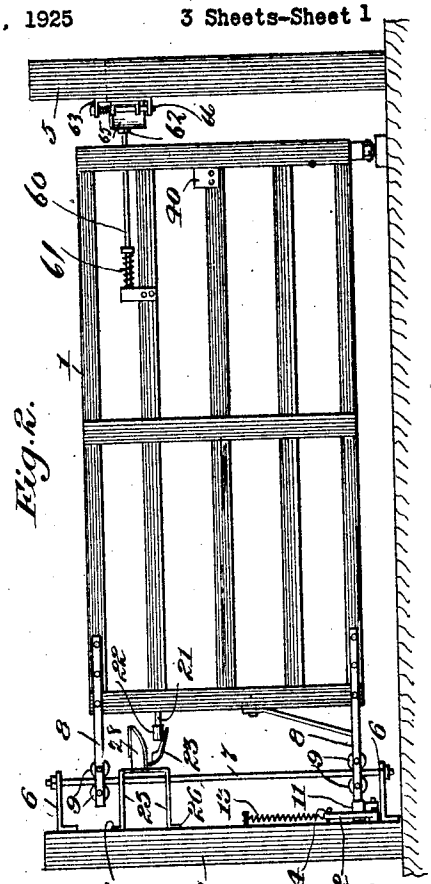


Fig. 2.

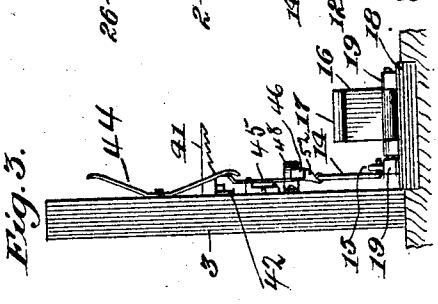


Fig. 3.

Inventor:
Thomas A. Matthews
by Geo. H. Evans
Atty.

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**T. A. MATTHEWS**

AUTOMATIC GATE

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*Fig. 4.*

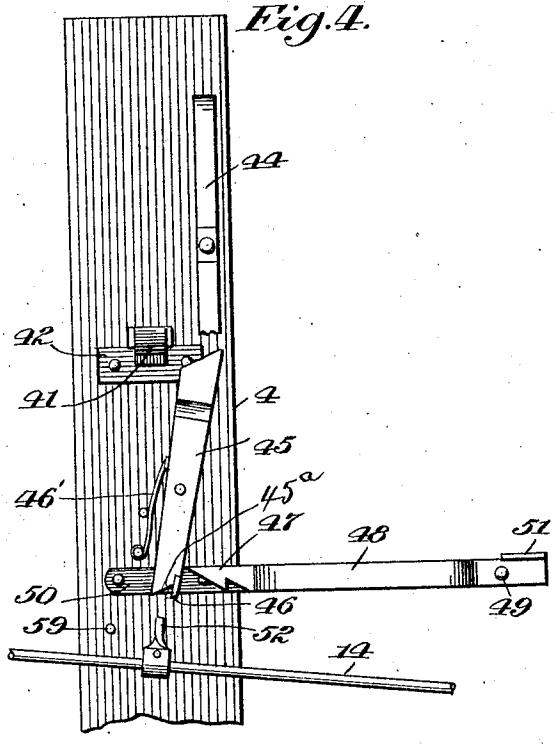



*Fig. 5.*

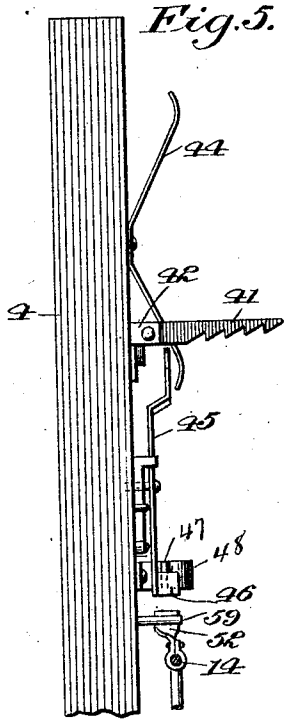



*Fig. 15.*

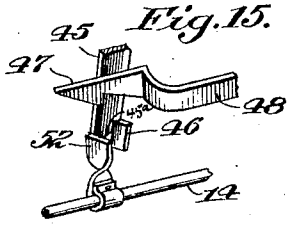



*Fig. 6.*

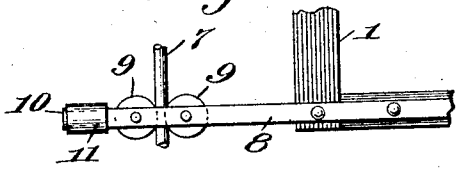



*Fig. 7.*

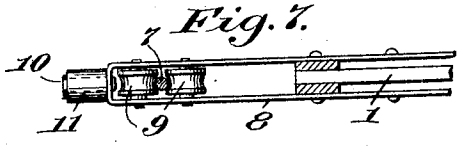
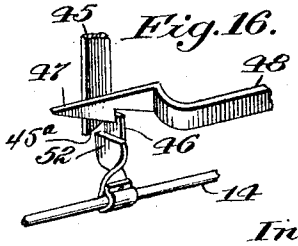



*Fig. 16.*




*Inventor:*
*Thomas A. Matthews*
*by Geo. H. Evans*
*Atty.*

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T. A. MATTHEWS

AUTOMATIC GATE

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Fig. 8.

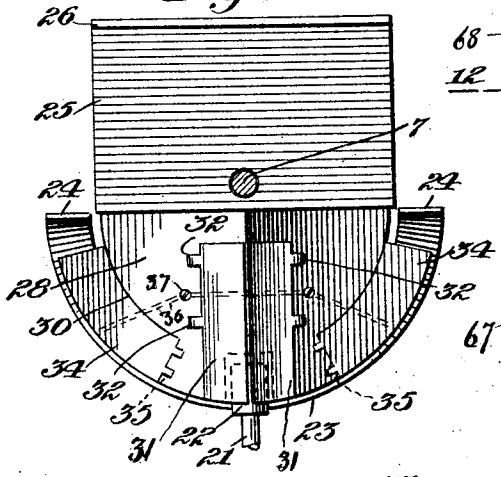



Fig. 11.

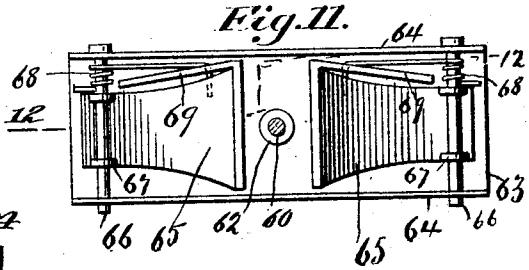



Fig. 12.

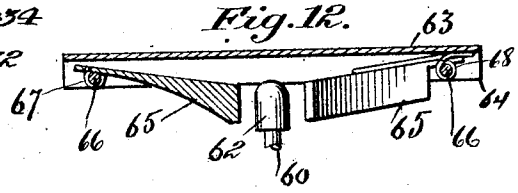



Fig. 13.

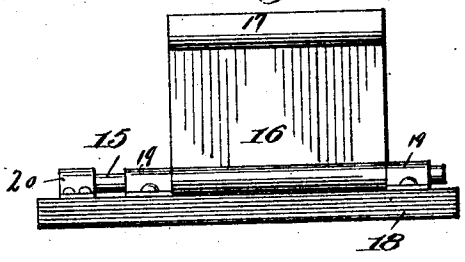



Fig. 9.

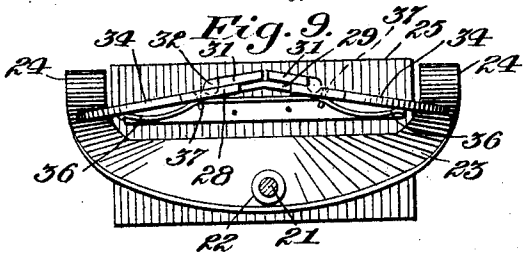



Fig. 10.

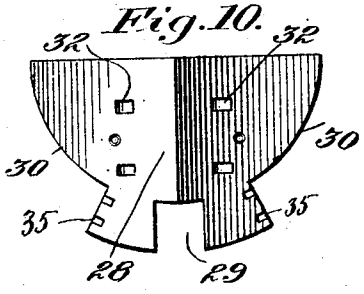
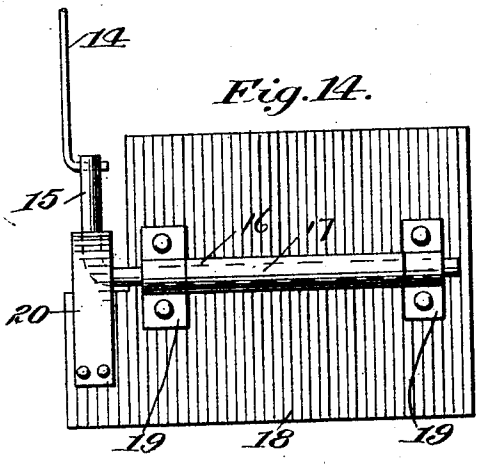



Fig. 14.




Inventor:
Thomas A. Matthews
by Geo. H. Evans
Att'y.

Patented Nov. 8, 1927. 1,648,691

# UNITED STATES PATENT OFFICE.

THOMAS A. MATTHEWS, OF BETHPAGE, TENNESSEE.

## AUTOMATIC GATE.

Application filed October 28, 1925. Serial No. 65,340.

My invention relates to an automatic gate. The objects of the invention are to provide a suitable and effective vehicle actuated mechanism which will on the approach of the vehicle lift and swing the gate from its closed position to open position and away from the vehicle, at the same time releasing the latch and finally latching the gate in its wide open position; also upon the vehicle passing through the gate-way to actuate a similar mechanism at the opposite side, to release the gate and cause it to swing to closed position after having released it from its locked position; also to provide a novel latch mechanism at the free end which coacts with the lifting mechanism at the hinged end of the gate to support and also lift said free end and thereby release it from its free end latching device.

The invention consists in the construction and arrangement of parts as will be hereinafter described and particularly pointed out in the claims.

These objects I accomplish by the construction shown in the accompanying drawings in which:

Figure 1 is a side elevation looking toward the posts at the hinged end of the gate;

Figure 2 is a front elevation of the gate with its vehicle-actuated levers omitted;

Figure 3 is a side elevation of one of the posts and latching mechanism for the free end of the gate when swung to open position together with one of the vehicle actuated levers;

Figure 4 is a front or face view of the latching mechanism shown at the right in Figure 1, on an enlarged scale;

Figure 5 is an enlarged view of the same as shown in Figure 3;

Figure 6 is an enlarged side elevation of the lower hinge construction;

Figure 7 is a plan thereof;

Figure 8 is an enlarged plan of the elevating mechanism for the hinged end of the gate;

Figure 9 is a front or edge view of the same;

Figure 10 is a plan of one member thereof;

Figure 11 is an enlarged front or face view of the latch for the free end of the gate;

Figure 12 is a sectional plan thereof on line 12—12 of Figure 11;

Figure 13 is an enlarged face view of one of the vehicle-actuated levers;

Figure 14 is a plan thereof; and

Figures 15 and 16 are perspective views in enlarged detail illustrating the manner of operating the tripping lever.

The gate 1 is hung on a post 2, and two posts 3 and 4 are arranged at opposite sides of the gate post 2 while a fourth post 5 is arranged for the latch mechanism of the free end of the gate as will be hereinafter fully described.

The gate post 2 is provided with an upper and a lower bracket 6, 6, carrying a vertical pintle-forming rod 7, forming the fixed member of the gate hinge. The gate is provided with open hinge leaves 8 between the two arms of which are journaled pairs of rollers 9—9 each pair embracing the pintle rod 7, so that the gate is forced to move up and down on the pintle as well as to swing in both directions thereon. The inner end of the lower hinge member 8 is provided with a longitudinally extending pivot pin 10, upon which is mounted a roller 11 engaged by the horizontal arms of the two bell crank levers 12—12; the vertically extending arms of which are provided with springs 13 and are connected by rods 14—14 with the horizontal crank arms 15—15 of the vertically disposed vehicle-actuated levers 16—16 located along one side of the roadway at opposite sides of the hinged end of gate 1 in the path of the wheels of an approaching or departing vehicle. The levers 16—16 are journaled in bearings 19 mounted on a suitable base or support 18 secured in the ground (see Figures 3, 13, and 14). The levers 16—16 are formed of flat plates having rounded upper edges 17 to form suitable contacts for the vehicle wheels. The levers 16 are held in their upright normal position by plate springs 20, which overlie their longitudinal crank arms 15. (See Figure 14.)

The hinged end of the gate 1 is further provided in the rear of pintle 7 with a longitudinal stud 21, upon which is mounted a gate lifting roller 22. This roller 22 rests normally on the lower middle portion of a return track 23, (see Figure 9) which track is curved upward from its central lower portion, in opposite directions, and inwardly towards the gate post 2 where its end portions terminate in upwardly extending stop arms 24. This track is secured to a box-like bracket 25 through which the pintle 7 passes. The bracket 25 has flanges 26 secured to the gate post 2 by screws 27. Overlying the the return tracks 23, is a second or lifting

track formed of a plate 28 mounted on the bracket 25 and inclined downwardly from its middle portion to its ends, and having its front edges cut away to form a central opening 29 and curved recesses 30 at opposite sides thereof. The central opening 29 overlies the central depressed portion of track 23, directly over the lifting roller 22 as shown in Figures 8 and 9, and the recesses 30 are over the inclines of plate 23. The central opening 29 is normally closed by inclined covers 31, 31, hinged at their opposite sides to the plate 28 as shown at 32 so as to swing upwardly at their free meeting edges. Switch forming track sections 34—34 formed of plates curved to fit the curved recesses 30—30, are hinged at their adjacent inner ends to plate 28 at the ends of the said recessed portions 30, as shown at 35, so as to swing vertically at their opposite lower free ends; the said switch forming track sections 34 extending at their free ends toward the stop arms 24 but are spaced therefrom as shown in Figure 8. These track sections 34—34 are pressed upwardly by a spring 36 secured at 37 to the under side of plate 28 with its free ends extending under the said track sections as shown in Figures 8 and 9.

It will be seen from the foregoing, that when one of the levers 16 is thrown towards the gate 1, by a vehicle wheel its crank arm 15 will be rocked inwardly which will cause it to pull its rod 14 which in turn will pull on the vertical arm of a bell crank lever 12 and so cause the horizontal arm of said bell crank to move upwardly against anti-friction roller 11 and lift the rear end of the gate. In its further movement the horizontal arm of the bell crank lever 12 will exert a pulling action on the said roller 11 which being in the rear of pintle 7 will cause the gate to swing at its free end towards one of the side posts 3 or 4. In the upward movement the upper anti-friction roller 22 will be raised and pass through the opening 29 and then up through the hinged covers 31, 31 which will then swing down to closed position under the roller 22.

The pull of the bell crank 15 will now cause the gate to swing forward and the roller 22 will travel downwardly off of the cover 31, which now forms part of the curved track, and then downwardly along the hinged track section 34 till it engages the adjacent stop 24 on the lower fixed track 23. As soon as the roller 22 passes beyond the end of the track section 34 said section will be raised by its spring 36 out of the path of the roller so that the roller will be free to travel from the stop 24 down the fixed track 23 to the lower middle portion thereof as shown in Figure 9. The inclined track 23 permitting the gate to swing closed by gravity.

To hold the gate in its open position however, with the roller 22 against the stop 24, until the vehicle has passed through, I have provided locking and releasing mechanisms located on the two side posts 3 and 4 to be engaged by a catch plate 40 secured at the free end of the gate as shown in Figure 2.

These locking mechanisms are alike and each comprises a notched latch 41, pivoted at its inner end to an attaching plate 42 secured to the side post and projecting towards the roadway so as to be engaged by the catch 40 when the gate is swung against said post; a buffer spring 44 serving to absorb the shock. The gate will now be held parallel with the roadway and out of the path of the approaching vehicle. To release the gate by the rear wheel of the vehicle passing through I provide releasing levers 45 pivoted between their ends to the posts 3 and 4 and each lever has an inclined upper end normally pressed out of engagement with the latch 41 by means of a spring 46′, (see Figure 4). The lower end of each releasing lever 45 is provided with an upwardly inclined or beveled surface 45ª and a laterally and downwardly extending lug or projection 46 at its forward edge to be engaged by the inner hooked end 47 of one of the latches 48 pivoted at their opposite ends, as at 49, to the outer end of supporting arms, 50, secured to the posts 3 and 4. Upon referring to the drawings it will be noted that the latches 48 are each provided with a bent portion adjacent its hooked end 47, the purpose of which being to permit a yielding movement in the length of the latch and at the same time a suitable cam, all of which will be more fully hereinafter set forth.

The pivoted ends of the latches 48 beyond the pivots 49 lie under stop lugs 51 formed on the outer ends of the supporting arms 50, so as to prevent the latches from swinging down out of operative position and yet allowing the hooked ends 47 to swing upwardly. The gate actuating rods 14, 14 are both provided with upwardly projecting lugs or arms 52 adapted to engage the lugs or projections 46, on the lower ends of releasing levers 45. These locking and releasing devices are oppositely arranged on the two posts 3 and 4 but are alike in construction.

The gate having been swung to its open position by an approaching vehicle and held open by its catch 40 engaging the notched latch 41 will be released after the vehicle has passed through as follows: The front wheel of the vehicle leaving the gate will press the actuating lever, at the right in Figure 1 for instance, downwardly which will throw its crank 15 upwardly and forwardly which will cause rod 14 to be raised till stopped by pin 59. As the rod 14 is moved the arm 52 carried thereby will engage behind the lug 46, carried by the lever 45, move the same forward until received within the notch 47 of the latch 48. During

this movement it will be noted that the upper end of the lever 45 does not actuate the latch 41. After the lug 46 has been received within the notch 47 and the front wheel of the operating vehicle has passed over the lever 16, the same drops back to its normal position, moving the rod 14 and the arm 52 from its engagement with the lug 46, which is permitted by the yielding movement of the latch 48. On referring to the drawings it will be apparent that by reason of the yielding movement within the length of the latch 48, the lug in its backward movement engages slightly the beveled portion $45^a$ of the lever, thus moving the lever back against the tension exerted by the latch 48 until the lug 46 is entirely free of the portion $45^a$, after which the lever 45 is returned to its first position by the latch 48. It is of course to be understood that by reason of the swinging movement that the arm 52 takes its engagement with the lug 46 is only slight and therefore its engagement with the portion $45^a$ in its backward movement is not sufficient to force the lug 46 from its engagement with the latch 48.

Now when the rear wheel of the vehicle passes over lever 16 forcing arm 15 upwardly the rod 14 moves upward until it engages the pin 59, pulling the lug or arm 52 forward causing it to engage the rear edge of the downwardly projecting lower end of the lever 45 (see Figure 15), drawing the lever 45 forward against the action of its spring 46' until the lug 46 is pressed beyond the curved portion of the latch 48, and disengaging the lug 46 from the hooked end 47 of the lever 45. This additional movement of the lever 45 moves it beneath the latch 41, and raises it sufficiently to release the gate. The gate is forced away from the post 4 by the tension of the spring 44, which has been under tension due to the pressure exerted thereagainst by the gate as it was held in open position by the latch 41. The roller 22 of the shaft 21 being adjacent one of the stops 24 of lower track 23 will now travel downwardly along the track 23 and cause the gate to swing by gravity to closed position.

The lever 45 will now return to its normal position by the action of the spring 46' as the latch 48 will yield laterally and allow the lever 45 to pass between the end 47 thereof and the arm 50 and permit the latch 41 to assume its normal position for engaging and holding the gate when it is again swung to open position.

This method of releasing the gate by requiring a movement of the lever 16 and rod 14 by both a front and a rear wheel of the vehicle is employed where the space is such that the gate must not be released too soon, without danger of its swinging to closed position and striking the vehicle before it has passed through the gate. However when there is sufficient space to permit of the gate being swung open a sufficient distance that this danger or objection is overcome, then the lever 45 could be initially moved a sufficient distance to actuate the releasing latch 41 by the action of the front wheel as it forces the lever 16 downward and the crank arm 15 to a vertical position.

The gate is held in closed position by means of a sliding bolt or rod 60 suitably mounted on the gate and forced outwardly through the outer end of the gate by a spring 61. The forward end of the bolt 60 is provided with a roller 62. Mounted on the post 11 is a plate 63 having the upper and lower edges bent at right angles forming flanges 64, 64. Jaws 65, 65 are journaled on the plate 63 by pins 66 passing through the flanges 64 of the plate 63 and ears 67, 67 of the jaws 65. Coiled springs 68 encircle the pins 66, 66 and tend to force the inner ends of the jaws outwardly from the plate 63 for confining the roller 62 of the bolt 60 therebetween and holding the gate closed. The outer faces of the jaws 65 are curved so that they are caused to swing inwardly toward the plate 63 when engaged by the roller 62 as the gate is being swung to closed position. The upper edges of the jaws are inclined downwardly from the inner ends of the jaws as at 69, to permit the roller 62 to travel by gravity down the inclined surface as the gate is being swung to open position.

When the gate is elevated by a vehicle operating one of the levers 16, as previously described, the bolt 60 and roller 62 will be raised above the upper edges of the inner ends of the jaws 65, and as the gate is swung to open position the roller 62 will engage the inclined surface 69 of one of the jaws 65, and gradually roll downwardly and swing clear of the jaws.

From the foregoing it will be seen that the gate may be opened and closed by the wheels of a vehicle as it approaches and passes through the gate. That the gate is first elevated to disengage the bolt 60 from the jaws 65, and then caused to swing to open position and locked in such position. The vehicle in passing through the gate will cause the gate to be released from the means holding it in open position, whereupon the gate will swing to closed position and held by the jaws 65, and bolt 60 and roller 62.

On gates for use of pedestrians the lower track 23, only, may be used, since the upper track will not be required on a small gate and the gate will therefore be more easily operated.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. The combination with a gate post having a vertically disposed pintle rod, a gate hinged to the rod to slide vertically thereon, and provided at its lower end with an operating arm in rear of said pintle rod, oppositely disposed bell cranks having horizontal and vertical arms engaging the lower edge of said operating member with their horizontal arms, actuating rods engaging the upper ends of the vertical arms of said bell cranks and means for actuating said rods from opposite sides of the gate, whereby the bell cranks will first lift the gate and then exert a pull to cause the gate to swing, and a stud on the gate in front of said pintle rod, of a track mechanism on the upper part of the gate post engaged by said stud for causing the gate to be swung after being lifted by either one of the bell cranks.

2. The combination with a gate post, the vertically movable swinging gate, and a stud projecting rearwardly from its hinged edge, a track mechanism on the upper part of the post and comprising a lower fixed track inclined from its middle upwardly in opposite directions and on the middle of which the stud normally rests, an upper track section having two hinged gates adapted to be lifted by the stud and then to fall under it, and two oppositely extending hinged members inclined downwardly in opposite directions and curved inwardly towards the rear ends of the lower fixed track member to guide the stud back to its normal position.

3. In an automatic gate, the combination of a gate post having a gate hinged thereto, means for elevating and causing the gate to swing, a track mounted on the post, a plate on the post having track sections extending downwardly toward the track, a spring for holding the track sections normally above the track, and a stud on the gate engaging a track section of the plate upon the elevation of the gate and traveling downwardly on said section to the track for causing the gate to swing to open position, and along the lower section to return the gate to closed position.

4. In an automatic gate, the combination of a gate post having a gate hinged thereto, means for elevating and causing the gate to swing, to open position, a track mounted on the post consisting of an upper and a lower section, said upper section having curved pivoted members extending at their opposite free ends downwardly and inwardly towards the ends of the lower track, a stud on the gate engaging the upper track section upon the elevation of the gate and traveling downwardly on said section to the lower section for causing the gate to swing to open position, means for holding the gate in open position, at both limits of its swing said first named means associated with said holding means and operating said holding means for releasing the gate and permitting said stud to travel along the lower section for returning the gate to closed position.

5. In an automatic gate, the combination of a gate post having a gate hinged thereto, vehicle actuated levers located along the roadway having crank arms connected thereto, a longitudinally movable actuating rod connected to each of the crank arms, bell crank levers connected to the post and to the adjacent ends of said rods for causing the gate to be swung to open position when one of the levers is operated by the wheel of a passing vehicle, gate posts located on opposite sides of the main gate post having latches thereon for engaging the gate and holding it in open position, a releasing lever pivotally mounted on each of the gate holding posts for operating the latch to release the gate, means on the actuating rods for operating the releasing levers, the other vehicle actuated lever being actuated by the vehicle upon passing through the gate-way causing the actuating rod and means carried thereby to engage and operate the releasing lever whereby the releasing lever will disengage the latch from the gate and allow the gate to return to closed position.

6. In an automatic gate the combination of a gate post having a gate hinged thereto, vehicle actuated levers located along the roadway having crank arms connected thereto, an actuating rod connected to each of the crank arms, means connected to the post and to the rods for causing the gate to be swung to open position when one of the levers is operated by the wheel of a passing vehicle, gate posts located on opposite sides of the main gate post having latches thereon for engaging the gate and holding it in open position, a releasing lever pivotally mounted on each of the gate holding posts for operating the latch to release the gate, a lateral projection located at the lower end of said lever, means on the actuating rods for operating the releasing levers, the vehicle actuated lever for operating the releasing lever being actuated first by the front wheel of the vehicle upon passing through the gate-way causing the actuating rod and means carried thereby to engage said projection and operate the releasing lever, and move it into position adjacent the latch, means for engaging and holding the releasing lever in such position, said last mentioned vehicle actuated lever being next engaged by the rear wheel of the vehicle and causing it to again operate the actuating rod, and means carried thereby, for engaging the lower end of the releasing lever and moving said lever out of engagement with said engaging means and to a

position where it will disengage the latch from the gate and allow the gate to return to closed position.

7. In an automatic gate, a means of holding a gate in its open position comprising a latch pivoted at its rear end to project towards the roadway and in the path of a catch on the gate, a spring-pressed releasing lever 45 pivoted between its ends below and at right angles to the said latch and adapted at its upper end to lift the latch; the lower end of the lever having an incline $45^a$ and a lateral lug 46, a pivoted latch 48 at right angles to the lever 45 and having a hooked end 47 to engage lug 46, and means for actuating upon the lower end of the lever 45 and lower edge of the latch 48 for the purpose described.

8. In a device of the class described, the combination of a vertically movable and horizontally swinging gate, a latch for holding the gate in an open position, and means for releasing said latch, said latch being released by two successive movements of said means for permitting the gate to move to a closed position.

9. In a device of the class described, the combination of a vertically movable and horizontally swinging gate, a latch for holding the gate in an open position, a movable member for releasing the latch from said gate, and said movable member being operated by two successive movements to permit the closing operation of the gate.

10. In an automatic gate, the combination of a gate post, a horizontally swinging gate connected thereto and adapted to move vertically thereof, a track carried by said post for supporting the adjacent end of the gate during its swinging movement, and a latch engageable with the free end of the gate for holding the same in a closed position and having means adapted to support the free end of the gate during its initial horizontal movement.

In testimony whereof I affix my signature.

THOMAS A. MATTHEWS.