Dec. 15, 1959 L. L. SUMNERS 2,917,283

TRAFFIC CONTROL APPARATUS FOR A CLOSED AREA

Filed April 22, 1954 2 Sheets-Sheet 1

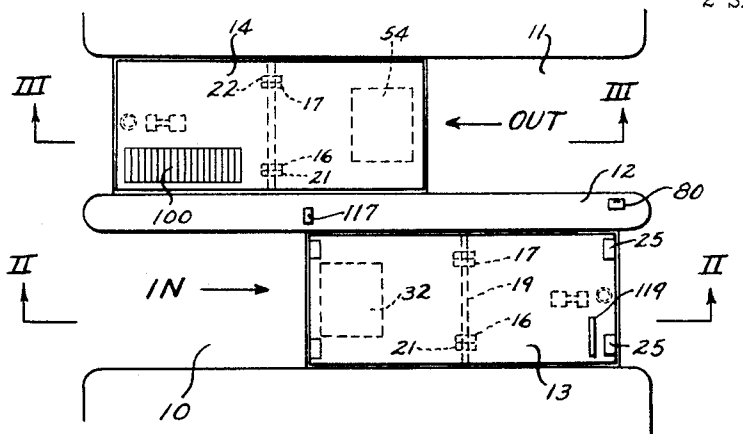


Fig. 1

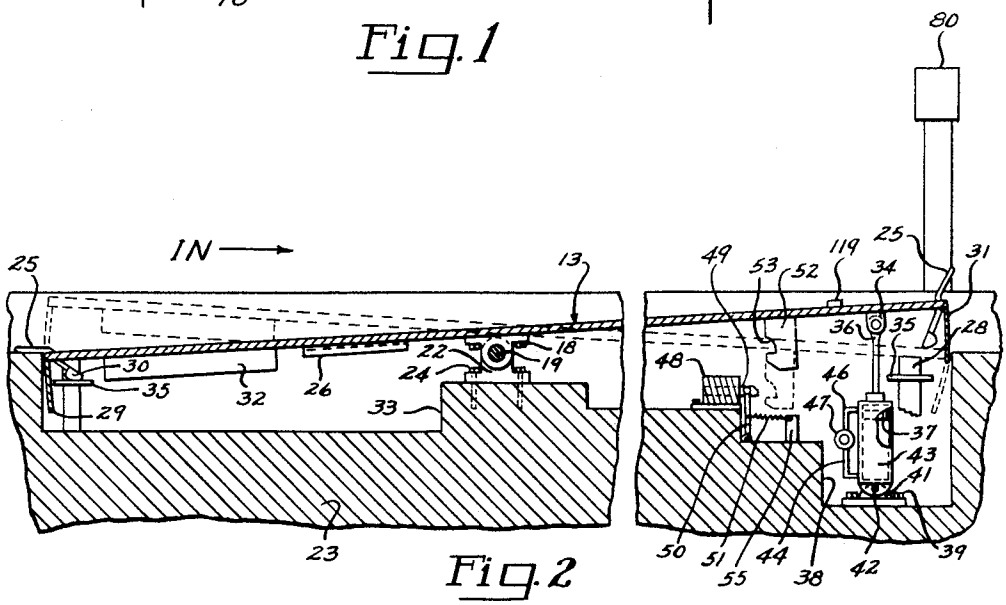
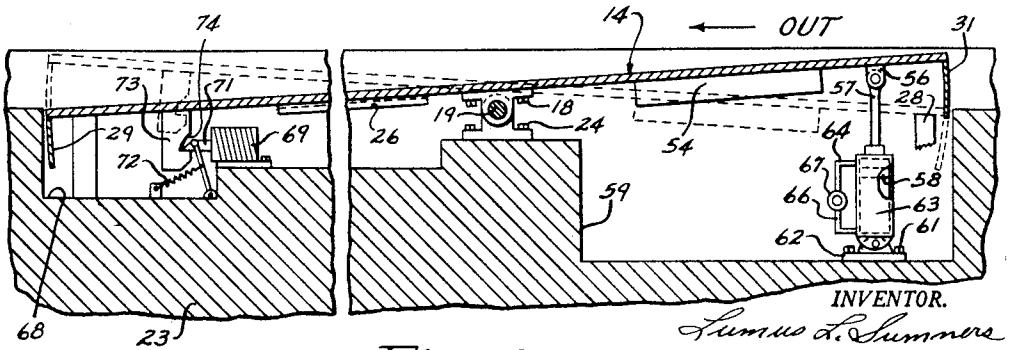


Fig. 2



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Fig. 3

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TRAFFIC CONTROL APPARATUS FOR A CLOSED AREA

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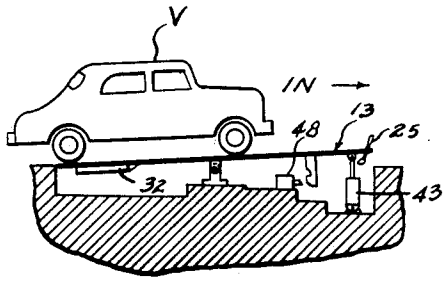


Fig. 5

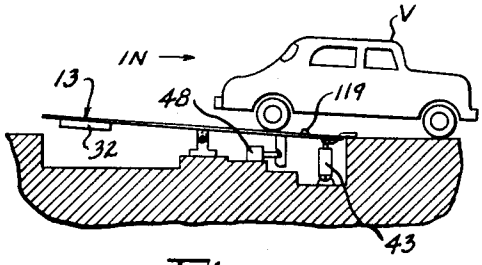


Fig. 6

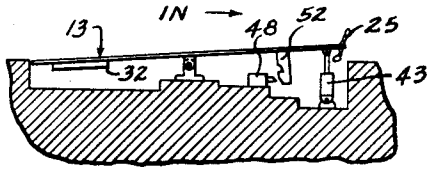


Fig. 4

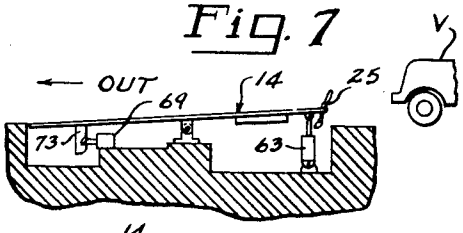


Fig. 7

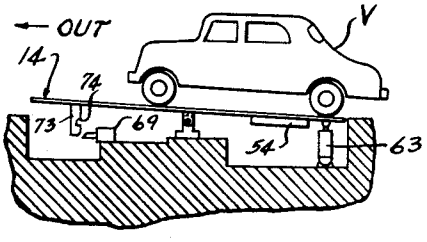


Fig. 8

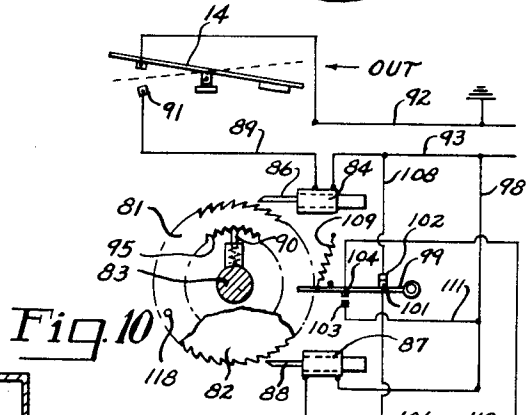


Fig. 10

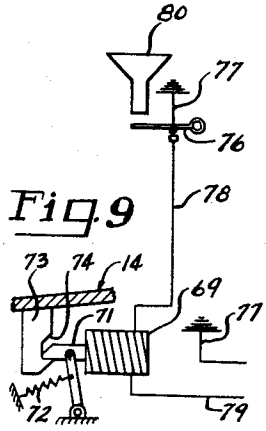


Fig. 9

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United States Patent Office 2,917,283
Patented Dec. 15, 1959

2,917,283

TRAFFIC CONTROL APPARATUS FOR A CLOSED AREA

Lumus L. Sumners, Birmingham, Ala., assignor of forty-five percent to Woodford R. Thompson, Jr., and ten percent to William G. Teal, both of Birmingham, Ala.

Application April 22, 1954, Serial No. 424,817

19 Claims. (Cl. 256—1)

This invention relates to traffic control apparatus for a closed area and more particularly to parking area way control apparatus for vehicles, such as automobiles and the like.

A prime object of my invention is to provide control means for operating a parking lot whereby a person merely deposits a coin in order to park his vehicle, thus eliminating the necessity of parking lot attendants.

Another object of my invention is to provide area way control means of the character designated which shall include improved means for controlling the passage of vehicles into and from the area, whereby only one vehicle can enter or leave at a given time.

A more specific object of my invention is to provide parking area way control means which shall embody pivoted platforms located in both the entrance and exit ways and improved means associated with both platforms limiting the flow of traffic to one direction thereover, together with control means associated with one of the platforms for barring the passage of a vehicle thereover until the control means has been released.

A further object of my invention is to provide parking area way control means which shall include means barring the passage of a vehicle into the parking area when the same is filled to capacity.

A still further object of my invention is to provide apparatus of the character designated which shall be simple of construction, economical of manufacture and which is adapted for installation in parking areas with a minimum of labor, materials and alterations.

Apparatus embodying features of my invention is shown in the accompanying drawings forming a part of this application, in which:

Fig. 1 is a plan view showing my improved apparatus mounted at the entrance and outlet of a closed area;

Fig. 2 is a sectional view taken along the line II—II of Fig. 1;

Fig. 3 is a sectional view taken along the line III—III of Fig. 1;

Fig. 4 is a side elevational view, partly broken away and in section, showing the position of the apparatus at the inlet of the closed area prior to the entrance of a vehicle;

Fig. 5 is a view similar to Fig. 4 showing the position of the apparatus as a vehicle commences its passage over the platform;

Fig. 6 is a view similar to Figs. 4 and 5 showing the position of the apparatus at the entrance way as a vehicle is about to leave the same;

Fig. 7 is a side elevational view, partly broken away and in section, showing the position of the apparatus in the outlet to the closed area prior to the release of the control means;

Fig. 8 is a view similar to Fig. 7 showing the position of the apparatus in the outlet way after the control mechanism has been released;

Fig. 9 is a diagrammatic view of the control means for releasing the apparatus whereby a vehicle may pass out the outlet way of the closed area; and,

Fig. 10 is a diagrammatic view showing the means preventing the entrance of a vehicle after the parking area is filled to capacity.

Referring now to the drawings for a better understanding of my invention, I show inlet and outlet ways **10** and **11**, respectively, which are separated by a suitable barrier **12**. While I show the inlet and outlet ways adjacent each other, it will be apparent that they may be any desired distance apart. For example, the entrance may be at one side of the closed area while the outlet is at another side thereof.

Mounted for pivotal movement in the inlet and outlet ways **10** and **11** above the elevation thereof are platforms **13** and **14** respectively. In view of the fact that the manner in which the platforms **13** and **14** are mounted for pivotal movement is identical, a description of one will suffice for both. The platform is secured intermediate its ends to laterally spaced brackets **16** and **17** by means of bolts **18**, or the like. The brackets **16** and **17** are provided with suitable openings for receiving a laterally extending shaft **19**. Opposite ends of the shaft **19** are mounted for rotation in bearings **21** and **22** positioned outwardly of the brackets **16** and **17** and secured to a foundation **23** by means of anchor bolts **24**.

The platform is reinforced by suitable stiffners, such as angle irons **26**. Downward movement of the ends of the platform is limited by stop members **27** and **28** positioned beneath opposite ends thereof. To prevent injury to persons and to eliminate the liability of objects passing beneath the raised end of the platform, guards **29** and **31** are provided at opposite ends thereof.

To prevent vehicles from passing onto the end of the platform which is raised, guard members **25** are pivotally mounted at the ends of the platform. Each guard member **25** is provided with a counterweight **30** which extends beneath the platform and actuates the guard member when the adjacent end of the platform is raised. When either guard member is lowered its counterweight engages a bracket **35** supported by the foundation, causing the upper end of the guard member to move parallel to the platform thus permitting a vehicle to pass thereover.

Secured to the under surface of the inlet platform **13** adjacent the approach end thereof is a counterweight **32** which urges that end of the platform down, as shown in Fig. 2. The foundation **23** is recessed as at **33** for receiving the counterweight **32**.

Secured to the under surface of the platform **13** adjacent the end thereof opposite the counterweight **32** is a bracket **34**. Pivotally connected to the bracket **34** is the upper end of a piston rod **36** carrying a piston **37** at the lower end thereof. The foundation **23** is recessed as at **38** beneath the bracket **34**, as shown in Fig. 2, and mounted in the recess by means of anchor bolts **39** is a bracket **41**. Pivotally connected to the bracket **41** by means of a pin **42** is a cylinder **43** for receiving the piston **37**.

Communicating with the bottom and top of the cylinder **43** are conduits **44** and **46** respectively. The conduits **44** and **46** are connected by a control valve **47** having a restricted orifice therein, the size of which may be varied to regulate the rate at which the platform **13** moves about its pivot point.

Mounted on the foundation **23** beneath the end of the platform **13** adjacent the cylinder **43** is a solenoid **48** having an armature **49**. Pivotally connecting the armature **49** adjacent the end thereof to the foundation **23** is a link **50**. The armature is urged outwardly of the solenoid by means of a tension spring **51** which is connected at one

end to the link 50 and at its other end to a fixed member 55. Secured to the under surface of the platform 13 and extending downwardly therefrom is a latch member 52 having a notch 53 therein which is in position to engage the armature 49 when the solenoid 48 is de-energized.

Secured to the under surface of the outlet platform 14 adjacent the approach end thereof is a counterweight 54 which urges that end of the platform downward, as shown in Fig. 8. Also, secured to the undersurface of the approach end of the platform 14 is a bracket 56. Pivotally connected to the bracket 56 is the upper end of a piston rod 57 which carries a piston 58 at the lower end thereof. The foundation 23 is recessed as at 59 beneath the approach end of the platform 14 and mounted in the recess by means of anchor bolts 61 is a bracket 62. Pivotally connected to the bracket 62 is a cylinder 63 for receiving the piston 58. Communicating with the upper and lower ends of the cylinder 63 are conduits 64 and 66 respectively. The conduits 64 and 66 are connected to a control valve 67 having a restricted orifice therein, the size of which may be varied so as to regulate the rate at which the platform 14 moves about its pivot point.

The foundation 23 is recessed as at 68 beneath the end of the platform 14 opposite the counterweight 54. Mounted in the recess 68 is a solenoid 69 having an armature 71. The armature 71 is urged outwardly of the solenoid by means of a tension spring 72 which is similar in construction and operation to the spring 51. Secured to and projecting downwardly from the under surface of the platform 14 is a latch member 73 having a notch 74 therein positioned to engage the outer end of the armature 71 when the solenoid 69 is de-energized.

The solenoid 69 is energized by a switch 76 which is connected to the solenoid 69 by a lead 78. The solenoid 69 is in turn connected to a source of electricity by leads 77 and 79. The switch 76 is actuated by control means indicated generally at 80 which is positioned to be accessible to the driver of an approaching automobile, as shown in Fig. 1. In view of the fact that such control means is well known in the art, no further description is deemed necessary. Suffice it to say that the control means may be in the form of coin actuated mechanism or mechanism actuated by a key or the like.

In order to bar the entrance of a vehicle when the packing area is filled to capacity and to permit the entry of a vehicle when a parking space is available, I provide means for recording the number of vehicles entering and leaving the parking area whereby an accurate record of the total number of vehicles in the parking area is maintained at all times. The recording means comprises a pair of toothed wheels 81 and 82 mounted rotatably on a shaft 83 and secured to each other in side by side relationship. Mounted adjacent the periphery of the wheel 81 is a solenoid 84 having an armature 86. The armature 86 is positioned to engage a toothed notch of the wheel 81 and rotate the same one notch in a counterclockwise direction each time the solenoid is actuated. Mounted adjacent the periphery of the wheel 82 is a solenoid 87 having an armature 88. The armature 88 is positioned to engage a toothed notch of the wheel 82 and rotate the same one notch in a clockwise direction each time the solenoid 87 is actuated. A spring biased detent 90 engages a ring gear 95 mounted on the toothed wheel 81, thereby restricting movement of the wheels 81 and 82 to one notch at a time.

One pole of the solenoid 84 is connected by a lead 89 to one side of a switch 91 which is actuated each time a vehicle, indicated at V passes over the platform 14. The other side of the switch 91 is connected by a lead 92 to one side of a suitable source of electricity. The other pole of the solenoid 84 is connected to the other side of the source of electricity by a lead 93.

One pole of the solenoid 87 is connected by a lead 94 to one side of a switch 96 which is actuated each time a vehicle passes over the platform 13. The other side of the switch 96 is connected to one side of a source of electricity by a lead 97. The other pole of the solenoid 87 is connected to the other side of the source of electricity by a lead 98.

Mounted for pivotal movement adjacent the toothed wheels 81 and 82 is a switch arm 99 having contact points 101—102 and 103—104. The contact point 101 is connected to one pole of the solenoid 48 by a lead 106. The other pole of the solenoid 48 is connected to one side of a source of electricity by a lead 107, thereby energizing the solenoid and maintaining the armature 49 in disengaged position relative to the notch 53 as long as the points 101—102 contact each other. The contact point 102 is connected to the other side of the source of electricity by a lead 108. The switch arm 99 is urged in a direction to contact the points 101—102 and to separate the points 103—104 by means of a spring 109. The point 103 is connected to one side of a source of electricity by a lead 111. The contact point 104 is connected to one pole of a solenoid 112 by a lead 113. The other pole of the solenoid 112 is connected to the other side of a source of electricity by a lead 114. The solenoid 112 is operatively connected to a suitable signal 116 which is moved to full line position, as shown in Fig. 10, when the solenoid is energized. The signal and solenoid may be mounted in a suitable housing 117.

Projecting outwardly of the toothed wheel 81 is a detent 118 which moves into position to actuate the switch arm 99 when the parking area is filled to capacity. Upon actuation of the switch arm 99, the points 101—102 are separated thereby de-energizing the solenoid 48 and releasing the armature 49 whereby it engages the notch 53 and holds the platform 13 in the dotted line position, as shown in Fig. 2. That is, the end of the platform 13 carrying the counterweight 32 is held in raised position, thus barring the entrance of a vehicle until a vehicle leaves the parking area. As a vehicle leaves the parking area the solenoid 84 is actuated by the switch 91 causing the wheel 81 to rotate in a counterclockwise direction, whereupon the detent 118 disengages the switch arm 99 and the points 101 and 102 contact each other, thereby energizing the solenoid 48 and causing the armature 49 to disengage the notch 53. The counterweight 32 then moves the platform 13 to the full line position shown in Fig. 2, thus permitting the entrance of another vehicle.

To prevent the discharge end of the platforms 13 from raising beneath a vehicle in the event the vehicle should stop before passing completely off the platform, I mount a pressure switch 119 adjacent the discharge end thereof in position to be engaged by the front and back wheels of the vehicle. The pressure switch 119 is in circuit with the lead 106 and is of the double acting type whereby the circuit to the solenoid 48 is broken when the front wheels of the vehicle engage the same. The circuit to the solenoid 48 remains open until the back wheels of the vehicle engage the switch, thus permitting the armature 49 to engage the notch 53 and retain the adjacent end of the platform in the down position. When the back wheels engage the pressure switch 119, the circuit to the solenoid 48 is closed again thereby energizing the same and withdrawing the armature 49 from the notch 53, whereupon the counterweight 32 moves the platform to the position shown in solid lines in Fig. 2. The pressure switch is so constructed that it requires a substantial weight to actuate the same, thereby preventing the switch from being accidentally actuated by pedestrians or the like.

In order to prevent the platforms 13 and 14 from being pivoted by a relatively lightweight, the counterweights 32 and 54 should be on the order of 1000 pounds. Also, to prevent vehicles from entering over the platform 14 when the parking lot is filled to capacity by depositing a coin after the vehicle drives onto the platform, a plurality of rollers 100 may be provided on the upper surface of the discharge end thereof.

From the foregoing description, the operation of my

improved apparatus will be readily understood. To enter the closed area, the vehicle V approaches the platform **13** as shown in Fig. 5. After passing the pivot point of the platform **13**, the weight of the vehicle causes the platform to move to the position shown in Fig. 6. After the vehicle leaves the platform **13** the counterweight **32** returns the same to the normal position shown in Fig. 5.

To leave the parking area, the vehicle must pass over the platform **14** since the end of the platform **13** toward the parking area is in raised position. The guard member **25** aids further in preventing a vehicle from passing over the raised end of the platform.

Due to the fact that the armature **71** is in engagement with the notch **74**, the end of the platform **14** toward the parking area is also in raised position. Upon the deposit of a coin or otherwise actuating the mechanism **80**, the solenoid **69** is energized, thus withdrawing the armature from the slot. The counterweight **54** then causes the platform **14** to move about its pivot point to the position shown in Fig. 8. As the vehicle passes the pivot point of the platform **14**, the platform moves about its pivot point to the position shown in Fig. 7, thereby permitting the vehicle to leave the closed area and at the same time re-engaging the armature **71** in the notch **74**. The platform **14** then remains in this position until the control mechanism **80** is again actuated.

The control valves **47** and **67** prevent the platforms from pivoting suddenly about their pivot points thus permitting vehicles to pass over the same without any discomfort to the occupants thereof or damage to the vehicle. The stop members **27** and **28** prevent the ends of the platforms from passing beneath the upper surface of the foundations **23** thereby providing an even surface for the vehicle to pass onto.

When the parking area is filled to capacity, the solenoid **112** is actuated, as described above, thus causing the signal **116** to extend across the platform **13** to bar the passage of a vehicle thereover. Also, at this time the solenoid **48** is de-energized and the armature **49** is in the notch **53**, thus holding the end of the platform **13** carrying the counterweight **32** in raised position. However, when a vehicle leaves the parking area the solenoid **84** is actuated thereby moving the toothed wheel **81** one notch in a counter-clockwise direction to release the switch arm **99**, thereby completing the circuit to the solenoid **48**. The armature **49** then disengages the notch **53** and permits the counterweight **32** to move the platform **13** to the position shown in Figs. 4 and 5.

From the foregoing it will be seen that I have devised improved means for controlling the flow of traffic into and from a closed area. By providing platforms which are pivotally mounted at both the inlet and outlet ways of the closed area, and means controlling the flow of traffic to a single direction, together with control means associated with one of the platforms for barring the passage of a vehicle thereover until the control means is actuated, my apparatus is simple of construction, economical of manufacture and trouble free in operation. By providing the control valves **47** to prevent sudden pivotal movement of the platforms in combination with the stop members **27** and **28** and the pressure switch **119** which prevents the discharge end of the platform **13** from engaging the undersurface of a vehicle, there is no liability of damage to the vehicle or discomfort to the occupants thereof.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. In traffic control apparatus for a closed area having

inlet and outlet ways, a first elongated platform comprising a relatively flat plate-like member mounted for pivotal movement adjacent the longitudinal center thereof above the elevation of one of said ways and extending longitudinally thereof in position for a vehicle to move up onto and down off the same, a second elongated platform comprising a relatively flat plate-like member mounted for pivotal movement adjacent the longitudinal center thereof above the elevation of the other of said ways and extending longitudinally thereof in position for a vehicle to move up onto and down off the same, said first platform and said second platform each being of a width and length to support an entire vehicle and move about its pivot point while the entire vehicle is supported thereon, means urging the approach end of each of the platforms downward, and releasable control means holding the approach end of at least one of the platforms in raised position until said control means is released.

2. Traffic control apparatus as set fortm in claim 1 in which the control means is coin actuated.

3. Traffic control apparatus as defined in claim 1 in which stop means is provided to limit downward movement of the ends of the platforms to a point adjacent the elevation of the adjacent way.

4. Traffic control apparatus as defined in claim 1 in which control means is provided for regulating the rate at which the platforms move about their pivot points.

5. Traffic control apparatus as defined in claim 1 in which downwardly extending guard members are mounted adjacent the ends of the platforms in position to prevent the entry of objects beneath the platforms.

6. Traffic control apparatus as defined in claim 1 in which the control means holding the approach end of at least one of the platforms in raised position comprises a latch member mounted beneath the end of the platform opposite the approach end, a solenoid mounted beneath the platform adjacent said latch member, an armature projecting outwardly of said solenoid in position to engage said latch member when the solenoid is de-energized, means urging said armature outwardly of said solenoid, and actuating mechanism operatively connected to said solenoid for energizing the same.

7. Apparatus as defined in claim 6 in which the actuating mechanism is coin operated.

8. Apparatus as defined in claim 6 in which the actuating mechanism is key operated.

9. Apparatus as defined in claim 1 in which the means urging the approach end of each of the platforms downward comprises counterweights adjacent the approach ends of each platform.

10. Apparatus as defined in claim 1 in which each of the platforms has one end thereof connected pivotally to one end of a piston rod, a piston mounted on the other end of said piston rod, a cylinder mounted beneath the platform in position to receive said piston, and a closed circuit in communication with opposite ends of said cylinder, there being an orifice in said circuit the size of which may be varied to regulate the rate at which the platform moves about its pivot point.

11. Apparatus as defined in claim 1 in which guard members are pivotally mounted at the ends of each platform and disposed to project upwardly thereof when the adjacent end of the platform is in raised position and to move to a position substantially parallel to the platform when the adjacent end thereof is in lowered position.

12. Traffic control apparatus for a closed area having inlet and outlet ways, a platform mounted for pivotal movement intermediate its ends above the elevation of one of said ways and extending longitudinally thereof over which vehicles pass and of a length to support an entire vehicle as it passes up onto and down off the same, a second platform mounted for pivotal movement intermediate its ends above the elevation of the other

of said ways and extending longitudinally thereof over which vehicles pass and of a length to support an entire vehicle as it passes up onto and down off the same, means urging the approach end of both of the platforms downward, control means holding the approach end of said second platform in raised position until said control means is released, and pressure switch mechanism adjacent the discharge end of said first mentioned platform disposed to be energized by the front wheels of a vehicle to hold the approach end of the platform in raised position and be energized by the rear wheels of the vehicle to release said approach end.

13. Traffic control apparatus for a closed area having inlet and outlet ways, a platform mounted for pivotal movement intermediate its ends above the elevation of one of said ways and extending longitudinally thereof over which vehicles pass and of a length to support an entire vehicle as it passes up onto and down off the same, a second platform mounted for pivotal movement intermediate its ends above the elevation of the other of said ways and extending longitudinally thereof over which vehicles pass and of a length to support an entire vehicle as it passes up onto and down off the same, means urging the approach end of both platforms downward, control means holding the approach end of at least one of said platforms in raised position until said control means is released, and means holding the approach end of the platform in the inlet way in raised position when the area is filled to capacity.

14. Traffic control apparatus for a closed area having inlet and outlet ways, a platform mounted for pivotal movement intermediate its ends and extending longitudinally of one of said ways over which vehicles pass, a second platform mounted for pivotal movement intermediate its ends and extending longitudinally of the other of said ways over which vehicles pass, means urging the approach end of both platforms downward, control means holding the approach end of at least one of said platforms in raised position until said control means is released, a rotatable member, means rotating said member a predetermined distance in one direction upon the entrance of a vehicle into the area, means rotating said member a predetermined distance in the opposite direction when a vehicle leaves the area, a switch adjacent said rotatable member, means on said rotatable member for de-energizing said switch when the rotatable member has rotated a predetermined distance in the first mentioned direction, and means actuated by said switch and operable to hold the approach end of the platform in the inlet way in raised position while said switch is de-energized.

15. Apparatus as defined in claim 14 in which the means actuated by the switch comprises a latch member mounted adjacent the end of the platform opposite the approach end thereof, a solenoid mounted adjacent said latch member and operatively connected to the switch, and an armature projecting outwardly of said solenoid in position to engage said latch member when the solenoid is de-energized.

16. Traffic control apparatus comprising a relatively flat elongated elevated platform pivotally mounted adjacent the longitudinal center thereof for pivotal movement longitudinally of the direction of traffic in position for a vehicle to move up onto and down off the same, said platform being of a width and length to support an entire vehicle and move about its pivot point while the entire vehicle is supported thereon, means urging the approach end of said platform downward, and control means holding the approach end of said platform in raised position until said control means is released.

17. Traffic control apparatus as defined in claim 16 in which the control means is coin actuated.

18. Apparatus as defined in claim 1 in which the platform having releasable control means holding the approach end in raised position has a plurality of rollers mounted on and projecting above the surface of the end thereof opposite the approach end.

19. Traffic control apparatus comprising a relatively flat, elongated elevated platform mounted for pivotal movement adjacent the longitudinal center thereof longitudinally of the direction of traffic in position for a vehicle to move up onto and down off the same and being of a length and width to support an entire vehicle and move about its pivot point while the entire vehicle is supported thereon, and means urging one end of said platform downward, whereby the flow of traffic is limited to one direction.

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