Sept. 16, 1930. O. W. WANKE 1,775,792

GATE OPERATING MECHANISM

Filed March 9, 1929 5 Sheets-Sheet 1

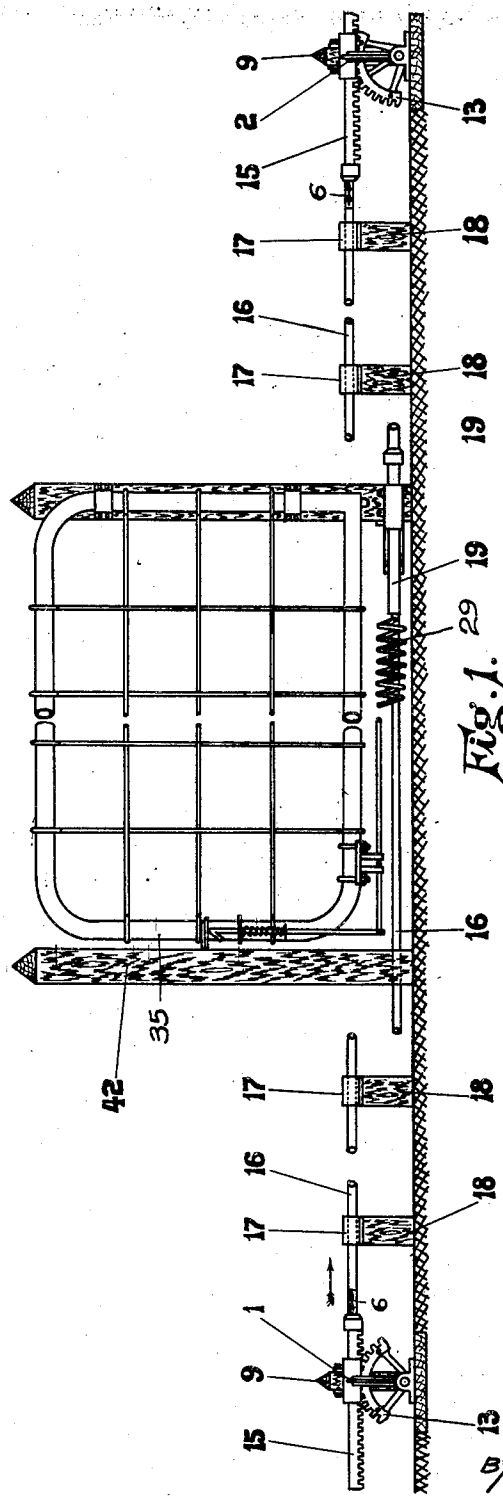


Fig. 1.

INVENTOR.
OSCAR W. WANKE
By Curtis L. Slee.
ATTY.

Sept. 16, 1930. O. W. WANKE 1,775,792

GATE OPERATING MECHANISM

Filed March 9, 1929 5 Sheets-Sheet 2

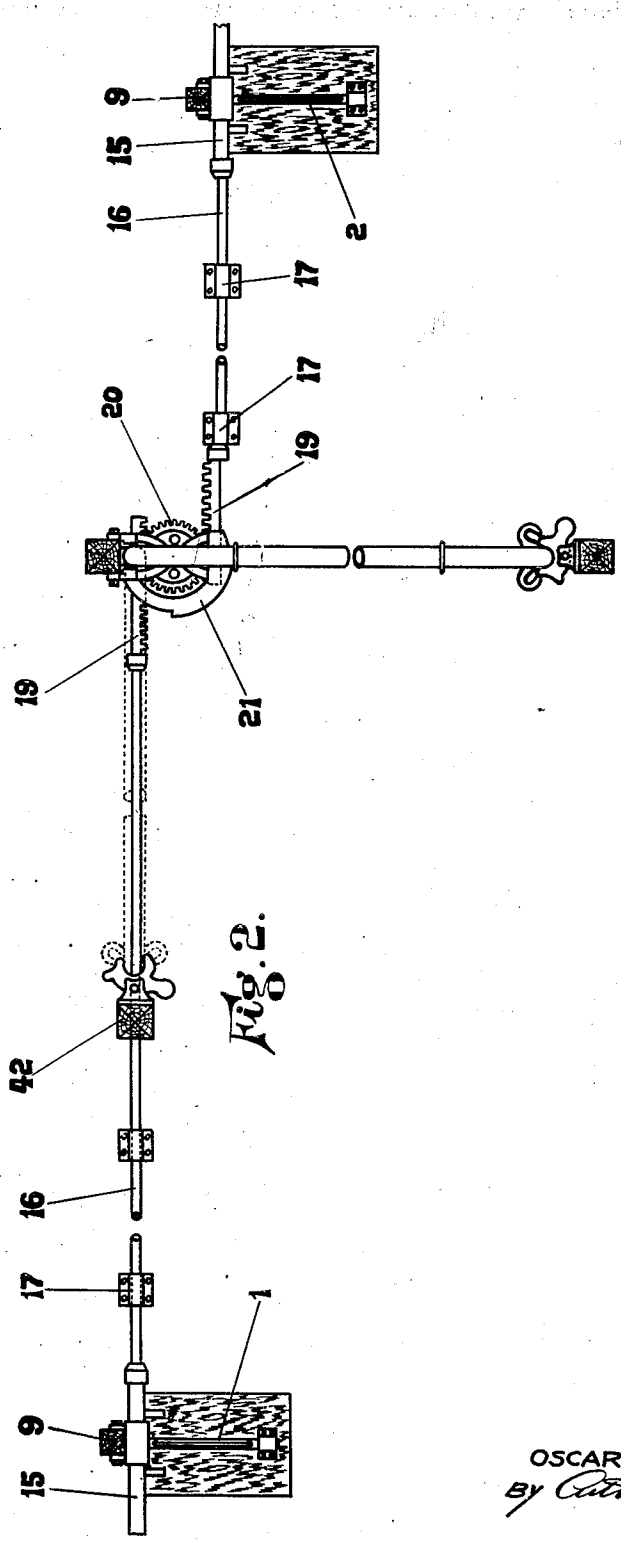


Fig. 2.

INVENTOR.
OSCAR W. WANKE.
By Arthur L. Slee.
ATTY.

Sept. 16, 1930. O. W. WANKE 1,775,792

GATE OPERATING MECHANISM

Filed March 9, 1929 5 Sheets-Sheet 3

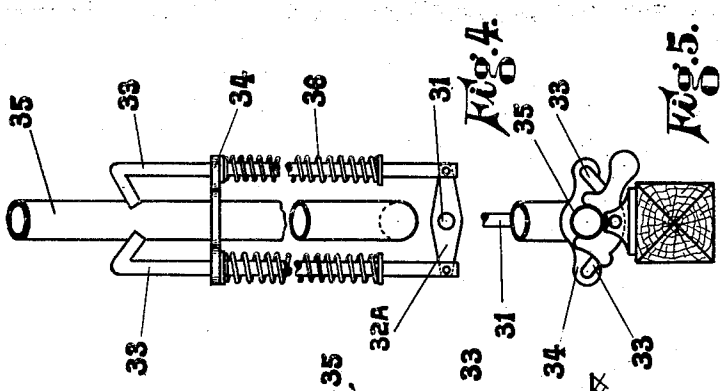


Fig. 4.

Fig. 5.

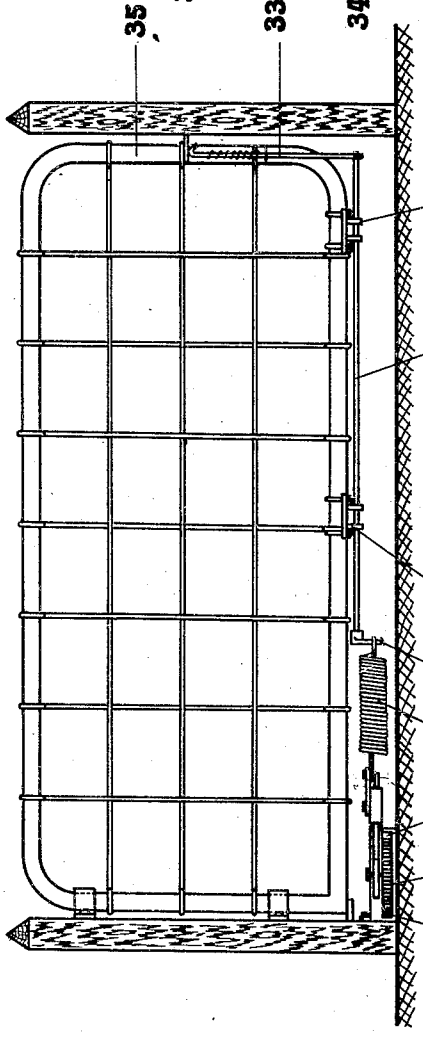


Fig. 3.

INVENTOR
OSCAR W. WANKE
By Arthur R. Slee
ATTY.

Sept. 16, 1930. O. W. WANKE 1,775,792

GATE OPERATING MECHANISM

Filed March 9, 1929 5 Sheets-Sheet 4

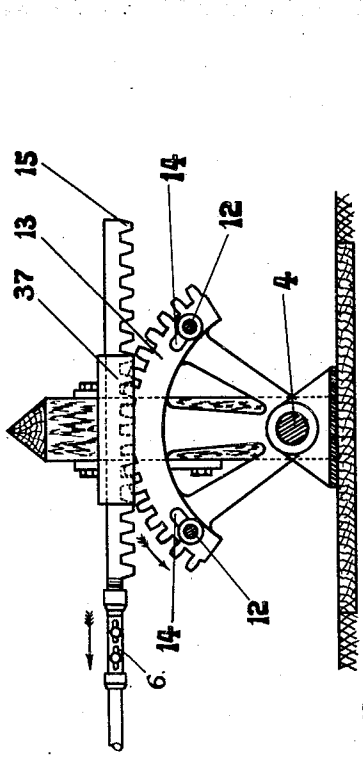


Fig. 7.

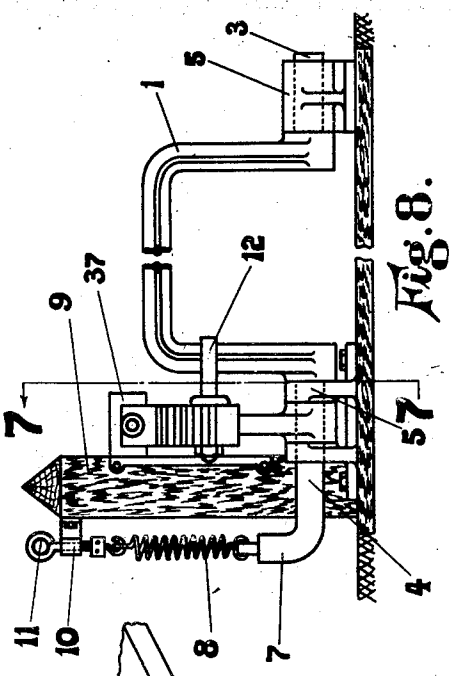


Fig. 8.

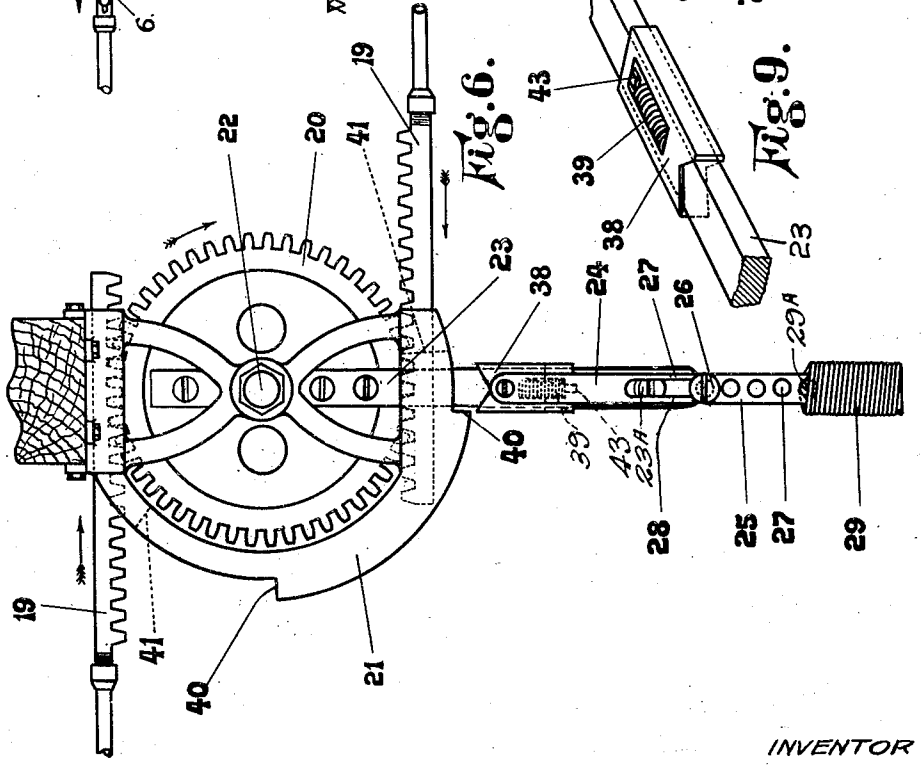


Fig. 6.

Fig. 9.

INVENTOR
OSCAR W. WANKE.
BY Arthur L. Slee
ATTY.

Sept. 16, 1930. O. W. WANKE 1,775,792

GATE OPERATING MECHANISM

Filed March 9, 1929 5 Sheets-Sheet 5

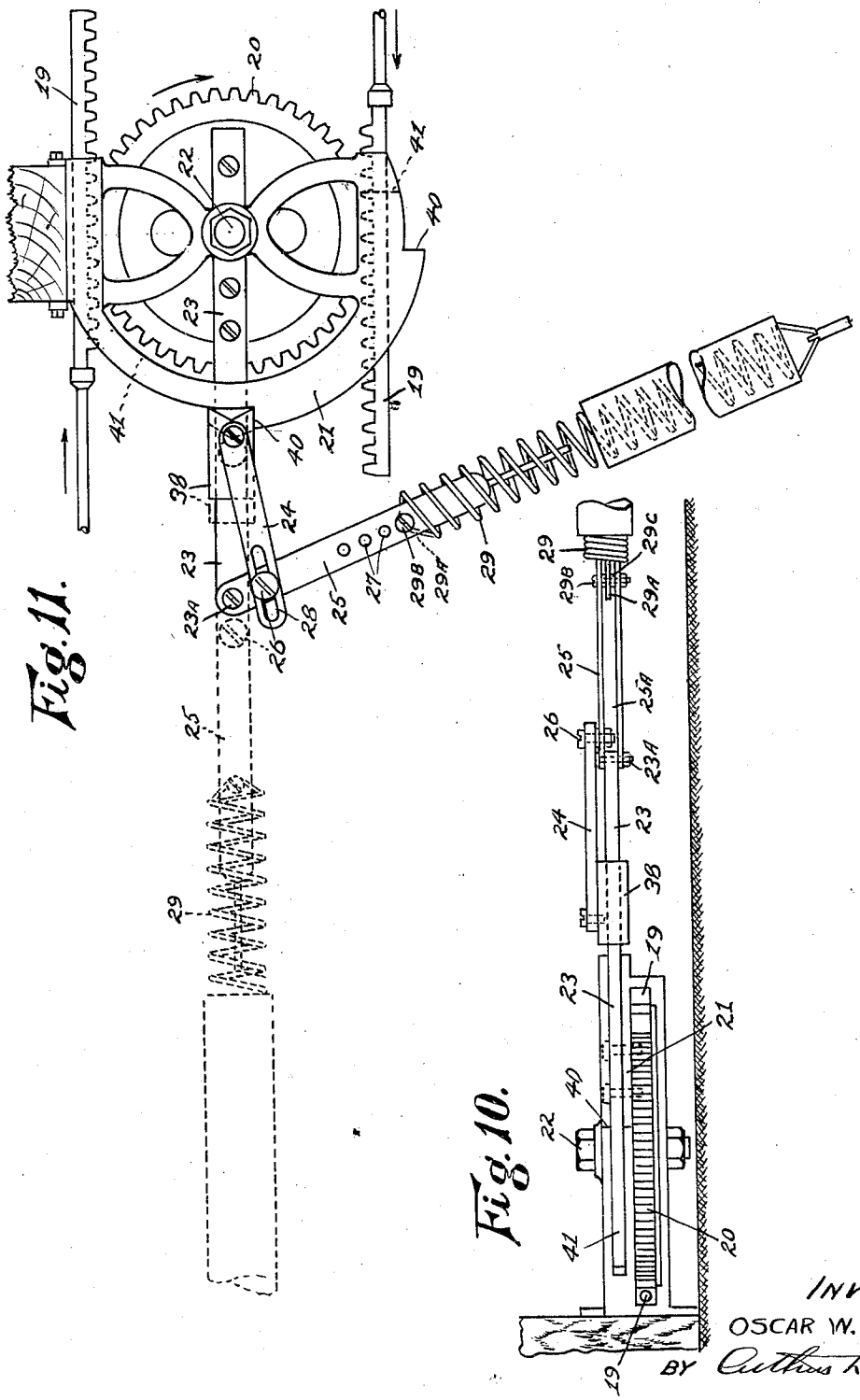


Fig. 11.

Fig. 10.

INVENTOR
OSCAR W. WANKE
BY Arthur L. Slee.
ATTY.

Patented Sept. 16, 1930 1,775,792

UNITED STATES PATENT OFFICE

OSCAR WILFRED WANKE, OF DANDENONG, VICTORIA, AUSTRALIA

GATE-OPERATING MECHANISM

Application filed March 9, 1929, Serial No. 345,758, and in Australia March 17, 1928.

My invention relates to improvements in mechanism for opening and closing gates by the passage of vehicles; and the objects of my improvement are, first, to provide a rugged, efficient and relatively inexpensive device for this purpose; second, to overcome the difficulties of inertia, shock and strain in the opening and closing of a gate; third, to enable a gate to be opened and shut from either direction with rapidity and ease, fourth, to provide a gate which may be opened and closed either by the passage of a vehicle or by hand when desired, and, fifth, to provide efficient means for adjusting the various parts of the mechanism.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view of the mechanism showing the gate in the open position, the central portion being on a reduced scale.

Figure 2 is a plan view showing the gate closed, and showing the open position of the gate in dotted lines.

Figure 3 is a front elevation of the gate.

Figures 4 and 5 illustrate details associated with the latching and unlatching of the gate.

Figure 6 is a plan view of the pinion and associated mechanism at the base of the gate at its hinged end.

Figure 7 is a view of a rack and quadrant taken on the line 7—7 of Figure 8, and

Figure 8 is a front elevation of a rack and quadrant and associated trip lever.

Figure 9 is a view of a detail partly illustrated in Figure 6.

Figure 10 is a side elevational view corresponding to Fig. 6;

Figure 11 is a view similar to Fig. 6 but showing the mechanism moved to the gate opening position.

Trip levers 1 and 2 are extended laterally to form pivots 3 and 4 accommodated in bearings 5. The pivot 4 is extended laterally and upwardly turned at its end 7 to form a lever engaging one end of a spring 8, the other end of which is connected to a post 9 preferably by bracket 10 and adjusting screw 11. The trip levers are adapted to be engaged by the wheels of a vehicle and to be thus depressed against the action of the springs 8. Each trip lever is adapted to engage separately two studs 12 offset from a toothed quadrant 13 rotatably mounted on the pivot 4. When a trip lever moves in one direction it engages one stud 12 and moves the quadrant in the same direction as its own movement and when it moves in the opposite direction it engages the opposite stud 12 moving the quadrant in the reverse direction. The studs 12 are adjustable in slots 14 on the quadrant. The quadrant engages a rack 15 on the end of a pull-and-push rod 16 slidably supported by guides 17 on posts 18 or by like means.

The pull-and-push rods may be adjusted in length by providing each of them with two overlapping pieces having corresponding bolt slots 6 so that they may be adjustably bolted together. One trip lever with its cooperating pull-and-push rod is positioned on each side of the gate and the end of each pull-and-push rod nearer to the gate is provided with a rack 19 engaging pinion 20 (see Figures 2 and 6).

Pinion 20, (Figs. 6, 10, 11) is housed in fixed casing 21 and is pivoted by means of a spindle 22 accommodated in top and bottom bearings on the fixed frame. The pinion 20 is rigidly connected to a lever arm 23 adapted to swing in a slot 41—41 and pivotally connected to a link 25 by a pin 23A. This link 25 passes into and almost through a spiral spring 29 and is formed of a piece of hoop iron doubled over so as to leave a longitudinal recess 25A in which one end 29A of the spring slides until it engages a limit bolt 29B which may be placed in any one of a series of holes 27. This engagement will normally take place when the lever arm 23 has completed almost half of its swing. The extent of this preliminary free sliding movement will be adjusted, by movement of the limit bolt, according to the size of gate to be used. A hollow distance piece 29C is placed on limit bolt 29B is recess 25A to keep the upper and lower halves of the link 25 from being drawn together. This gives the end of the spring free movement. The other end of the spring 29 is connected

to a crank arm 30 (Fig. 3) on the end of a rotatable rod 31 which is carried by bearings 32 secured to the gate. The end of the rotatable rod 31 is connected to a cross bar 32A (Figs. 4 and 5) pivotally connected to vertical rods 33 passing through apertures in a guide piece 34 secured to the frame 35 of the gate.

When the spring is extended as hereinafter explained it pulls the crank arm 30 and partly rotates the bar 31 and cross bar 32A raising one of the rods 33 against the action of a spring 36 and lowering the other vertical rod 33. This causes the gate to be unlatched when necessary. The bar 31 is prevented from sliding longitudinally by inserting through it a split pin (not shown) between the lugs of one of the two bearings 32.

When a motor car or other vehicle passes over a tripping lever the latter is swung round through about a quarter of a circle and it engages one of the studs on the adjacent quadrant carrying the quadrant round through about a quarter of a circle. This operates the pull-and-push rod as previously explained, the rack on the latter being held in engagement with the quadrant by a slideway 37 (Figs. 7 and 8) carried by the post 9. The pull-and-push rod rotates the pinion 20 carrying round the lever arm 23 and thus extending the spring 29 through the medium of the links 23 and 25. This extension of the spring first unlatches the gate as above described and thereafter the tension on the spring causes the gate to swing open. The spring is provided so that the gate and unlatching mechanism will not be subjected to a sudden shock when a vehicle passes over the tripping lever. The spring stores up the force transmitted from the vehicle through the tripping lever and draws the gate open.

It will be obvious that means must be provided to maintain the spring in its expanded position after the wheel of the vehicle has passed beyond the tripping lever; otherwise, the spring would again contract and prevent the gate from swinging open to any appreciable extent. For this reason a plunger sleeve 38 is provided which is held out of engagement with abutment shoulders 40 on the fixed frame by a link 24 which is pivoted to the front end of the plunger sleeve 38 and is also pivoted to the link 25 by means of a pin 26 which is adapted to slide in a slot 28 in the link 24 and which engages an aperture in the link 25 so that it is positioned slightly further from the end of the link 25 than is the pin 23A. Consequently in the closed and full open position of the gate the plunger sleeve 38 is held out of engagement with the shoulders 40 as above stated. The plunger sleeve 38 is provided with a compression spring 39 fitted in a slot on the upper portion of the plunger sleeve so that one of its ends presses against the front end of the slot and tends to push the plunger sleeve forward into engagement with a shoulder 40 while its other end bears against a square pin 43, on the lever arm 23, as shown in Figure 9. The link 24 holds the spring 39 within the slot. When the passage of a vehicle operates the mechanism as above described, the lever 23 is swung round into the position shown in Figure 11 and the spring 29 is extended. The pin 26 in this position no longer bears against the end of the slot 28 and consequently the spring 39 is able to press the plunger sleeve into engagement with the adjacent shoulder 40.

Consequently, when the wheel of the vehicle moves the tripping lever the engagement of the plunger sleeve 38 with the shoulder 40 keeps the spring 29 under tension and brings the gate into the open position where it is similarly latched on the post 42 (Figs. 1 and 2) if desired. When the gate almost reaches the full open position, the link 25 moves into longitudinal alinement with the link 23 and the pin 26 again bears against the end of the slot 28 and draws the plunger sleeve out of engagement with the shoulder 40 so that, when the wheel of the vehicle strikes the second tripping lever, the mechanism is free to swing in the reverse direction so as to shut the gate.

The action of the rods 33 (Fig. 4) and associated parts is reversible.

This movement of the pull-and-push rod 16 simultaneously causes a movement of the opposite pull-and-push rod in the opposite direction so as to draw the opposite quadrant towards the gate. As the vehicle proceeds forward it passes the gateway and one of its wheels engages the second trip lever reversing the movement of the mechanism, thus releasing the gate from the post 42 and swinging it inwardly into the shut position. At the same time the two quadrants pass into their initial position while the springs 8 return the trip levers to the vertical position. When a vehicle approaches the gate from the opposite direction the action is the same as that described. If at any time the gate should be left open inadvertently the passage of a vehicle in either direction would not cause any damage to the mechanism and would cause the gate to shut after passing through.

As the gate swings open in one direction only, according to its normal form, the trip lever on that side of the gate will be positioned one gate's length further away from the gate than the second trip lever is.

Normally, the pull-and-push rods are formed of iron piping of three eights inch inner diameter or may be solid rods of about five eighths inch diameter. They should be

supported at intervals of about five feet to prevent sagging or buckling.

Thus the gate is opened and shut without any necessity for stopping the vehicle. The gate may also be opened by hand.

I claim:—

1. The combination, in mechanism for opening and closing a gate by the passage of vehicles, of tripping levers, pull-and-push rods adapted to be operated by said levers, pivoted means adapted to be swung through an arc of a circle by said pull-and-push rods, resilient means, links connecting said pivoted means to one end of said resilient means, a rod rotatably carried by the gate, a crank arm on said rod and connected to the other end of said resilient means, latch-actuating means adapted to be raised and lowered by rotation of said rotatable rod.

2. The combination, in mechanism for opening and closing a gate by the passage of vehicles, of tripping levers, with pull-and-push rods, toothed gearing connecting said tripping levers with said pull-and-push rods, a fixed casing, abutment shoulders on said fixed casing, an arm pivotally mounted in said fixed casing, a plunger sleeve slidably mounted on said arm, a spring tending to press said plunger sleeve inwardly to engage said abutment shoulders, a link pivoted at one end to said sleeve and slotted at the other end, a second link, a pivot pin on the end of said second link and engaging said slot, a spring surrounding said second link and connected at one end thereto, a latch, vertical rods adapted to actuate said latch, a rod carried by the gate and rotatable about its longitudinal axis, a cross member connecting said rotatable rod to said vertical rods, a crank arm on said rotatable rod and connected to the other end of said spring.

3. Mechanism for the opening and closing of a gate by the passage of vehicles, having a rack and quadrant, with offset studs adjustably mounted on said quadrant, and a pivoted tripping lever adapted to engage said offset studs during its forward and backward swing.

4. In mechanism for opening and closing a gate by the passage of vehicles, the combination of a tripping lever of inverted U-shape, with pivot arms formed as lateral extensions of said tripping lever, bearings accommodating said pivot arms, a lever formed as an extension of one of said pivot arms, a support, a spring connected at one end to said lever and at other end to said support, a pivotally mounted toothed quadrant, studs adjustably carried by said quadrant and engaged by the lever to actuate said quadrant, a pull-and-push rod, and a rack on the end of said pull-and-push rod adapted to engage the teeth of said quadrant.

5. The combination, in mechanism for opening and closing a gate by the passage of vehicles, of tripping means on each side of the gate, inflexible longitudinal actuating means adapted to be moved by forward depression of the tripping means on one side of the gate and to move simultaneously the tripping means on the other side of the gate into the gate-shutting position, latch-operating and gate-swinging means adapted to be operated by the movement of said longitudinal actuating means, and means adapted to raise the tripping means after each vehicle has passed, each tripping means being free to move in a direction contrary to that of the actuative movement for which it is then set.

In testimony whereof I affix my signature.

OSCAR WILFRED WANKE.

CERTIFICATE OF CORRECTION.

Patent No. 1,775,792. Granted September 16, 1930, to

OSCAR WILFRED WANKE.

It is hereby certified that error appears in the above numbered patent requiring correction as follows: In the drawings, Sheet 5, Fig. 11, should appear as shown below instead of as shown in the drawings;

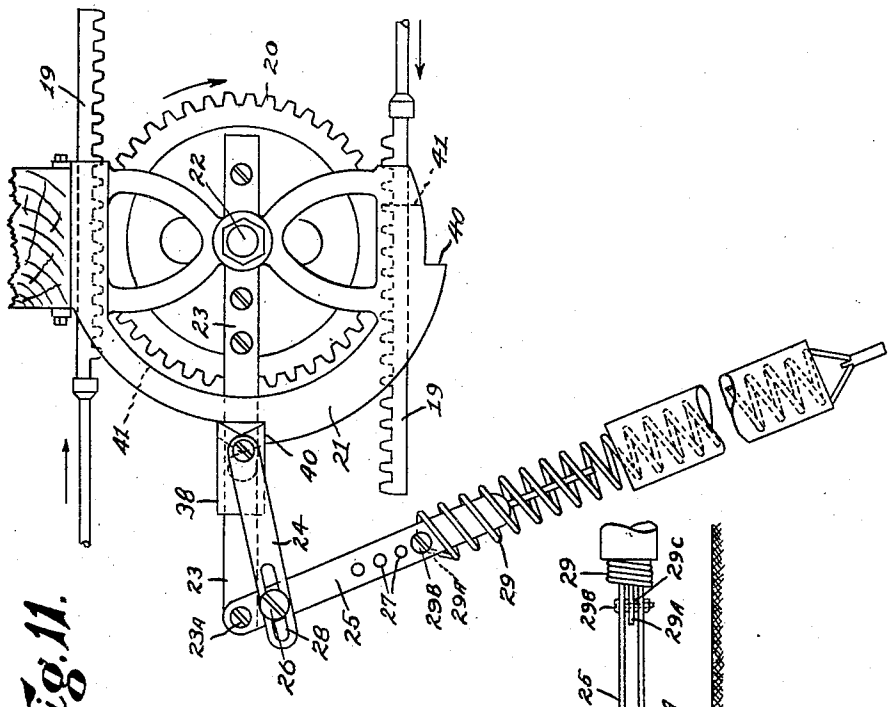


Fig. 11.

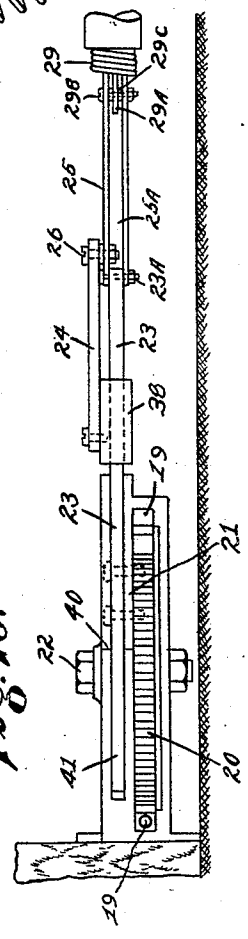


Fig. 10.

and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 27th day of January, A. D. 1931.

M. J. Moore

(Seal)

Acting Commissioner of Patents.