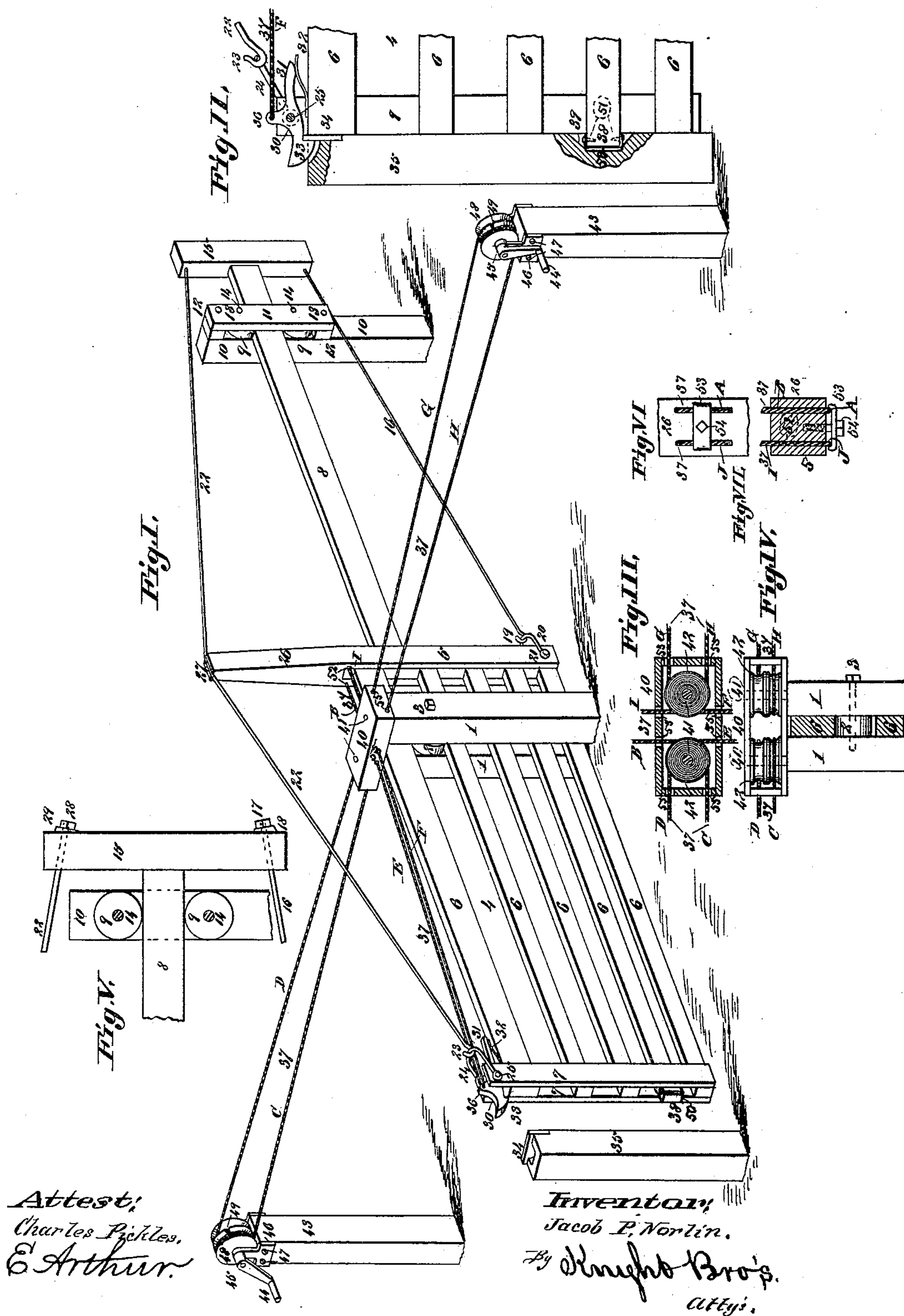


J. P. NORLIN.
SLIDING GATE.

No. 403,694.

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UNITED STATES PATENT OFFICE.

JACOB P. NORLIN, OF HEMKER, MISSOURI.

SLIDING GATE.

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To all whom it may concern:

Be it known that I, JACOB P. NORLIN, of Hemker, in the county of Franklin and State of Missouri, have invented a certain new and
5 useful Improvement in Sliding Gates, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

10 This invention relates to a roller-track pendent gate operated by draw-cords and crank-pulleys; and the invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

15 Figure I is a perspective view of the gate, and shows its roller-track and the crank-pulleys and cords by which it is operated. Fig. II is an enlarged detail elevation of the latching-post and toe of the gate. Fig. III. is an
20 enlarged horizontal section of the central pulley-box, showing pulleys housed therein, and a detail of the operative cords that actuate the gate. Fig. IV is an enlarged vertical section of said pulley-box, with a detail of its
25 supporting-posts, and shows the balance track-roller on which the gate travels. Fig. V is an enlarged detail of the balance-bar, the rear guide-post, the anti-friction rollers it carries, the combined counterpoise and brace-
30 carrier bar, and the rear terminals of the metal braces secured to said bar. Fig. VI is an enlarged detail rear elevation of the heel-post of the gate, and shows the clamping device for fastening the ends of the actuating
35 wire rope after taking up the slack of the same and for refastening after the wire stretches and has been readjusted. Fig. VII is an enlarged horizontal section of the same, and shows the clamping-iron gripping the
40 ends of the wire ropes when impressed by the set-screw.

Referring to the drawings, 1 represents the central supporting-posts, and 2 the track-roller, which turns on a journal-pin, 3, that
45 passes through one of the posts, through the roller, and into the other supporting-post.

4 is the sliding gate; 5, the heel-post and central brace-carrier, into which post the heels of the gate-bars 6 are mortised.

7 are the vertical double toe posts or studs, 50 between which the toes of the gate-bars are secured by any suitable means. The upper bar of the gate runs on the roller 2 between the double posts 1, from which roller the gate hangs pendent, and on which it travels as it
55 slides or is carried back and forth, the posts being planted with just sufficient intervening space between them to allow the free slide play of the gate.

8 represents a counterpoise-bar, the front 60 end of which is mortised and secured in the heel-post 5 of the gate and which runs between double anti-friction rollers 9, supported by the guide-post 10, which is planted at the rear sliding limit of the gate.

11 is a vertical journal-bearer stud, which, 65 with the intermediate blocks, 12, at its ends, is secured to the guide-post 10 by screw-bolts 13, the said blocks intervening to project the stud sufficiently to allow free play for the
70 anti-friction rollers 9, between which the counterpoise-bar runs, and for the bar itself. The rollers have their bearings on the journal-pins 14, that pass through the bracket-bearing stud, through said rollers, and into
75 the guide-post.

15 represents a counterpoise brace-carrier bar, into which the rear end of the counterpoise-bar 8 is mortised. This bar has the combined functions of a counterpoise-weight 80 to balance the gate and of a tension-brace carrier. The rear end of the lower brace-rod, 16, is passed through the lower end of said bar and secured thereto by the screw-nut 17, for which the bevel-washer 18 provides an
85 equalizing-seat. The hook 19 at the forward end of said brace-rod engages with a clevis, 20, secured to the foot of the heel-post 5 of the gate by the bolt 21.

22 represents an elevated compound brace- 90 rod, the hook 23 on the forward end of which engages with a clevis, 24, secured by the bolt 25 to the toe-posts 7 of the gate near their upper ends. The said compound brace-rod is elevated in the middle over the extension-top 26
95 of the heel-post 5 in the groove 27, in the top of which the rod is seated. The rear end of the brace-rod passes through near the top end

of the combined counterpoise and brace bar 15. To this bar it is secured by the screw-nut 28, for which the bevel-washer 29 provides an equalizing-seat between said nut and the counterpoise-bar.

It will be seen that should the gate settle and sag, as is the fashion of all things mundane as age comes creeping on, it can be straightened up and righted by the relative adjustment of the screw-nuts 17 and 28. It will thus also be seen that by the use of these adjustable brace-rods I am enabled to dispense with the usual diagonal brace, which would be in the way of the free sliding of the gate between its central supporting-posts, for said posts are preferably placed sufficiently near together to prevent the fluttering of the gate and of the roller on which it runs, and from which it hangs pendent, as also to reduce to a minimum the span of the journal-pin on which said roller has its bearings.

30 represents a trip-latch that works between the upper ends of the toe-posts of the gate, and that has a pivotal bearing on the bolt 25, on which also the upper brace-rod clevis, as stated, has its bearing. The rear arm, 31, of said latch is elevated by the strap-spring 32, by which means the catch 33 of the latch in its normal position, when the gate is closed, always engages with the latch-plate 34 on the head of the latching-post 35, so as to insure the fastening of the gate in its closed position. A perforated tripping-lug, 36, surmounts the latch with which it is integral, and in the perforation in said lug the actuating wire rope 37 is seated, which rope both trips the latch and operates the sliding gate, as will be hereinafter more fully described. The post 35 is planted at the extreme forward limit of the sliding gate.

38 represents a forward extension of one of the bars 6 of the gate, which extension is seated within the bevel-slot 39 near the foot of the latching-post when the gate is closed, which prevents pigs or other stock from forcing the bottom of the gate out of place in their endeavors to trespass through. It also, when the gate is closed in its normal position, bears up the weight at the sag end of said gate and releases the brace-rods from their otherwise continuous tension. The extended end of the bar is protected by a metal strap, 50, that is secured thereto by nails or screws 51.

I will now describe the actuating devices by which the gate is simultaneously unlatched and slid open and afterward closed and relatched without the rider's having to alight from the vehicle or horse.

40 represents the pulley-box housing that crowns the summits of the duplicate supporting-posts 1, to which it is secured by the vertical pivot-bolts 41, which each pass through the cover of the box and each through one of the duplicate double pulleys 42 and into the top of one of the posts.

43 represents two posts, which are planted alongside the track on opposite sides of said

gate at a convenient distance for drivers and riders as they approach and leave the same to operate the hand-cranks 44, the axles 45 of which run in bracket-bearers 46, that are secured to the top of the posts 43 by screw-bolts 47, and on which axles are mounted the double draw-pulleys (not drive-pulleys) 48, that carry and draw the actuating wire rope 37. The division-ridge between the two sections of each double draw-pulley 48 has a recessed notch, 49, which provides a passage for the wire rope from the coil around one concave recess of the said double pulley to the other.

The wire rope is preferably integral from end to end, the said ends being located at the rear of the heel-post 5 of the gate through perforations 52, in which post they are passed, and beneath which perforations, after drawing up the slack of the rope, the ends are bent down, and are there securely fastened by the clamping-iron 53, whose grip is enforced by the clamping-screw 54, which passes through said iron and is screw-seated in said post.

55 are perforations in all four sides of the pulley-box in line with the travel of the rope to and from the pulleys inclosed therein.

The actuating wire rope that slides the gate, when made, as it preferably is, of a single rope, may be rove or placed in position (taking Fig. 1 for my descriptive base) as follows: One end of the rope is passed through the farther of the perforations 52 in the heel-post of the gate, and the rope is drawn through until only the clamping end A of said rope is left exposed at the rear of said post. The rope then passes *via* B from said post to and partly around one of the sections of one of the double transit-pulleys 42 within the pulley-box 40, (it being obvious and understood that as the rope passes to and from said pulleys it runs through the perforations 55 in the pulley-boxes that are in line with it.) From said pulley it travels *via* C to one section of one of the operative double pulleys 48, around the concave recess of which it is coiled a fully sufficient number of turns (if the gate is closed) to pay out in slack the rear end of the cord C B on the off side of the gate as said gate slides back to its open terminal. The cord then passes through the notch 49 into the corresponding concave recess of the adjacent section of the double pulley, and should the gate be closed the rope need there take but a single turn around said pulley.

It may here be stated that it is preferred that the rope should take an extra turn around each section of the operative pulleys more than is paid out in either opening or closing the gate, so as to hold the rope securely in position and in the notch in which it is passed from one seat to the other of the pulley.

The rope passes *via* D from the operative pulley to the other section of the same double transit-pulley, 42, around which it previously turned, and from that passes *via* E to and

through the perforation in the trip-lug that surmounts and lifts the latch, passing to and from said trip-lug under the clevis 24. The rope is now in the middle of its course. From the latch the rope passes *via* F to one section of the second double transit-pulley 42, and turns partly around it. It then passes *via* G to one section of the second operative pulley, around which it is coiled, and, as in its corresponding pulley, passes through the notch 49 into the concave recess of the adjacent section of the double pulley, and after being coiled a sufficient number of times around the same it goes *via* H to the other section of the same double transit-pulley, 42, that it last occupied in the pulley-box. From this it passes *via* I to and through the high perforation 52 in the heel-post 5 of the gate, through which perforation the last extremity, J, of the wire rope projects. The reeving of the rope is now effected, and its varied course is plainly indicated by consecutive letters. After the slack has been taken up in the rope the ends A and J, that protrude from the rear of the heel-post 5 of the gate, are bent down, and the clamping-iron 53 is made to grip the same tightly by turning the clamp-screw 54, which passes through the said clamping-iron and into its screw-seat in the heel-post.

The operation in effecting the sliding of the gate is as follows: Suppose that the driver or rider approaches the gate on the high side, as seen in Fig. I, the gate being completely closed and latched, as shown in Fig. II. Without alighting he stops opposite the hand-crank operative pulley on the said high side of the gate and turns the handle in a right-hand rotation, so as to wind up the section of the cord marked G, and at the same time pay out the section marked H. The pay out of section H slackens section I to allow the gate to run back; and at the same time the draw on section G draws section F, the effect of which is, first, to trip the latch, and, secondly, to slide the gate back until it is fully opened, the rope remaining stationary in the perforation of the trip-trigger of the latch, because, as the gate slides back, the other moiety of the rope with its transit and operative pulleys is moved by the tension exerted upon section D through post 5 in the same manner as the active one. After driving or riding through the open gateway the gate is closed by turning the crank-handle of the operative pulley at the other side of the gate, which is at that time opposite the operator. It will thus be seen that both the opening and closing of the gate are effected without the traveler's having to alight. When the rope stretches, the clamp-screw 54 and clamping-iron 53 are loosened or removed, and the slack is then taken up in the rope, and the clamping-iron and screw replaced to hold it to its adjustment.

There are four places at which the rope remains immovable while sliding the gate—viz., at the trip of the latch, at the notches in

the bevel-rims that separate the adjoining concavities of the sections of the two double operative pulleys, and at the clamped ends of the rope at the rear of the heel-post of the gate; but in the last three of said positions the rope has to be moved when, after stretching, the slack is taken up.

The tension brace-rods 22 and 16 provide effective means to prevent the gate from sagging or to right it up and brace it if it ever settles from the square.

By the use of my duplicate central supporting-posts, 1, between which the gate travels on the track-roller journaled to said posts, the counterpoise-bars 8 and 15, the guide-post 10, the anti-friction-rollers 9, and the tension-rods 16 and 22, with the especial arrangement of the transit-pulleys and operative hand-crank draw-pulleys, the trip-latch, and the actuating-chain, with its clamping device at the rear of the heel-post, in connection with other attachments, my gate is operated, latched, and unlatched without the necessity of any surmounting-frame, which is obstructive to the passage of high loads, &c.

It will be seen that the turning-point in the operation of the actuating wire rope is at the notch 49, that crosses the dividing-ridge between the two sections of the operative draw-pulleys 48, in which notch the rope is seated and always immovable when the gate is sliding either in opening or closing, as stated in the previous description of said parts. The inner plies of the coil of the rope around the pulley on each side of said notch are preferably supernumerary coils that are never unwound while the gate is operated, so that they hold the rope firmly in said notch, in which it is transferred from one section to the other of said pulley. The only time when the rope needs to be moved past said dividing ridge or notch is when, having stretched, (which it will in course of time, especially when new,) the slack is required to be taken up, at which time it is redrawn through the heel-post of the gate, and again secured by my screw clamping device 53 54 at the rear of said heel-post.

In conclusion it will be seen that when sliding the gate open by the action of one of the cranks and operating draw-pulleys on the wire rope they actuate the portion of the rope passing between the off or rear side of said draw-pulley *via* the transit-pulley 42 to the latch, and the front end of the gate has a positive action exercised on it, the initial step of which lifts the spring trip-latch, and thus unfastens the gate, and then as the draw (not drive) pulley continues to coil up the rope around its rear concave section the concave sections of said pulley next the crank-handle pays out or uncoils its section of the rope that reaches from the said dividing ridge or notch therein of said pulley *via* the transit-pulley 42 to the heel-post of the gate, where the end of the rope is clamped. Thus the last-named por-

tion of the rope has a negative slack action exercised on it, which allows full play for the positive action of the other portion of said rope, as previously described.

5 In closing the gate, the action of the cranks and operative rollers being reversed, their relatively positive and negative actions on the forward and rear portions of the rope, as described above, are reversed also.

10 If only a horse and his rider or foot travelers require to pass through the gateway, it is evident that a turn or two of the crank-handle will slide open the gate sufficiently.

I claim as my invention—

15 1. In a sliding gate, the combination of the gate, the double central supporting-posts, the track-roller that carries the gate between said posts, the journal-bolt that is inserted in the posts and carries said roller, the counterpoise-
20 bar 8, secured to the heel-post of said gate, the counterpoise brace-carrier bar 15, the guide-post 10, the anti-friction rollers 9, between which said counterpoise-bar runs, the
25 journal-frame that houses said rollers, and the journal-bolts that carry them, substantially as described, and for the purpose set forth.

2. In a sliding gate, the combination of the double central supporting-posts, the track-
30 roller that carries the gate between said posts, the gate void of a diagonal brace and having a heel-post with a surmounting extension, the horizontal counterpoise-bar 8, secured to the rear of said heel-post, the guide-post 10, the
35 anti-friction rollers it carries, between which said bar runs as the gate slides, the vertical counterpoise-bar 15 on the end of the bar 8, the clevis 20, secured to the foot of said heel-post, the lower brace-rod, 16, that hooks in
40 said clevis and runs through the lower end of the counterpoise-bar 15, the equalizing-washer 18 on the rear end of said rod, the nut 17, that adjusts the tension of said brace-rod, the
45 clevis 24, secured at the top of the toe-posts of the gate, the compound brace-rod 22, that hooks into said clevis, is elevated and carried in a recessed seat at top of the surmounting
50 equalizing-washer 29, and the screw-nut 28, that regulates the adjustment of said upper brace-rod, substantially as described, and for the purpose set forth.

3. In a sliding gate, the combination of the
55 gate, the supporting-posts between which, and the track-roller on which, said gate runs, the counterpoise-bars 8 and 15 to balance and steady the gate, the guide-post 10, the anti-friction rollers journaled to said post, between
60 which rollers the bar 8 runs, the forward extension, 38, of one of the gate-bars near the bottom, the latching-post 35, planted at the forward limit of the gate when closed, the bevel-slot 39 in said post, in which the projecting end
65 38 of one of the gate-bars is seated when the gate is closed, the latch-plate 34 at the head

of said post, and the trip-latch on the gate that engages therewith when the gate is closed, substantially as described, and for the purpose set forth.

4. In a sliding gate, the combination of the gate having an elongated heel-post, the double posts 1, between which, and the track-roller 2 on which, the gate runs, the counterpoise-bars, the brace-rods, the double pulleys 42, that
75 relatively surmount said posts, the perforated box-housing that incloses said pulleys, and the journal-bolts on which said pulleys run and that secure said pulleys and their housing to the heads of said post, substantially as
80 described, and for the purpose set forth.

5. In a sliding gate, the combination of the gate, the two central posts between which, and the track-roller on which, said gate runs, the double pulleys 42, each journaled to the
85 top of the post it surmounts, the box in which said pulleys are closely housed, the said box being perforated for the passage of the actuating-rope, the guide-post 10; having anti-friction rollers, the counterpoise-bars, the
90 transversely-stationed posts 43, the journal-bearer brackets that surmount said posts, the hand-crank 44, the axles 45, and the double draw-pulleys 48, that are mounted on said axles, substantially as described, and for the
95 purpose set forth.

6. In a sliding gate, the combination of the double central posts between which, and the track-roller on which, the gate runs, the said gate provided with an elongated heel-post, the counterpoise-bars 8 and 15, the tension
100 brace-rods 16 and 22, the automatic trip-latch 30, the latching-post and latch-plate with which said latch engages, the double transit-pulleys 42, journaled on the top of said central posts, the perforated box-housing that
105 incloses said pulleys, the transverse outstanding posts 43, the journal-bearing brackets that surmount said posts, the axles having bearings in said brackets, the hand-crank 44, mounted on said axles, the double draw-pulleys 48, the actuating-rope 37, that the
110 crank-pulleys drive and that drives the gate, and the clamping-iron 53 and clamp-screw 54, that fastens the ends of the rope to its adjustment, substantially as and for the purpose set forth.

7. In a sliding gate, the combination of the gate, the two central supporting-posts, the track-roller journaled between said posts, on
120 which roller the gate runs, the double transit-rollers 42, each respectively journaled to the top of the post it surmounts, the box perforated for the passage of the actuating-rope, the transversely-stationed posts 43, the mounted
125 double draw-pulleys that surmount the last-named posts, the crank-handles that turn said pulleys, the actuating-rope 37, that coils around said draw and transit pulleys, the dividing-ridges between the concave sections
130 of the draw-pulleys being provided with notches in which the rope is seated as it

passes from one concave section to the other,
arranged for the actuating-rope while oper-
ative to remain stationary in said notches,
and the portions thereof on each side of said
5 dividing-point at said notches to have rela-
tively and alternatively as the gate opens and
closes a positive draw and negative pay-out

action, substantially as described, and for the
purpose set forth.

JACOB P. NORLIN.

In presence of—

BENJN. A. KNIGHT,
SAML. KNIGHT.