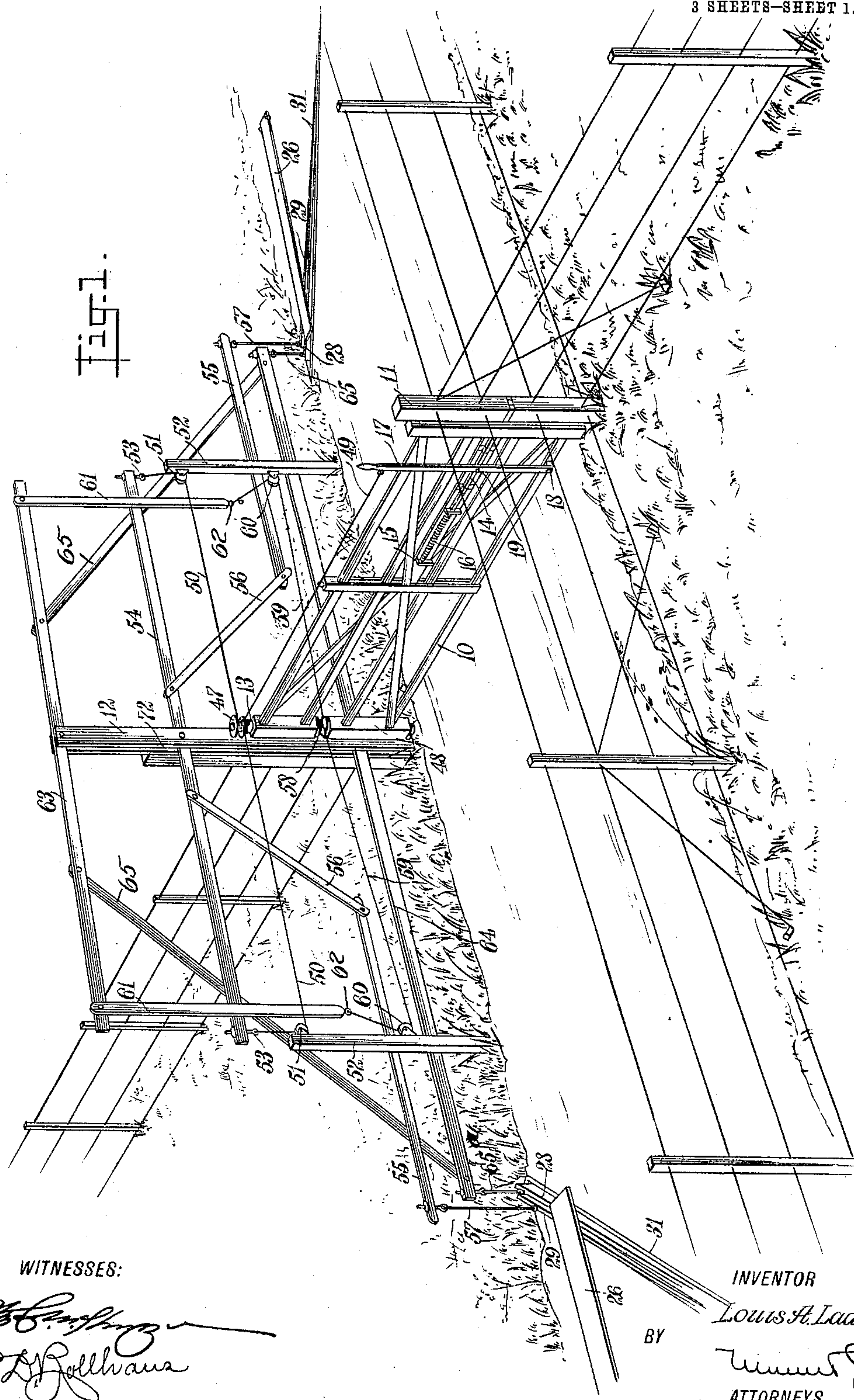


995,262.

L. A. LAAS.
AUTOMATIC GATE.
APPLICATION FILED JULY 23, 1910.

Patented June 13, 1911.

3 SHEETS-SHEET 1.

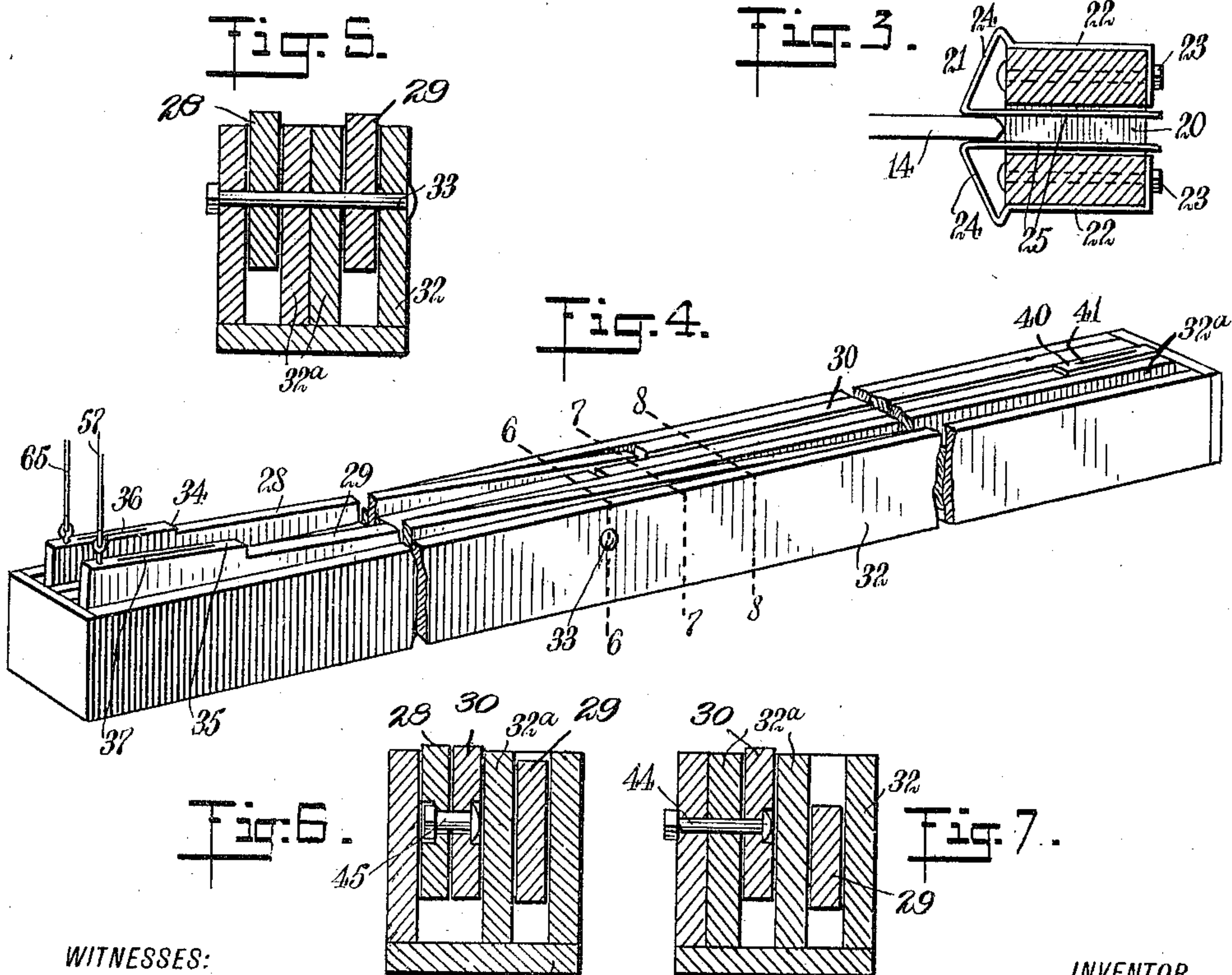
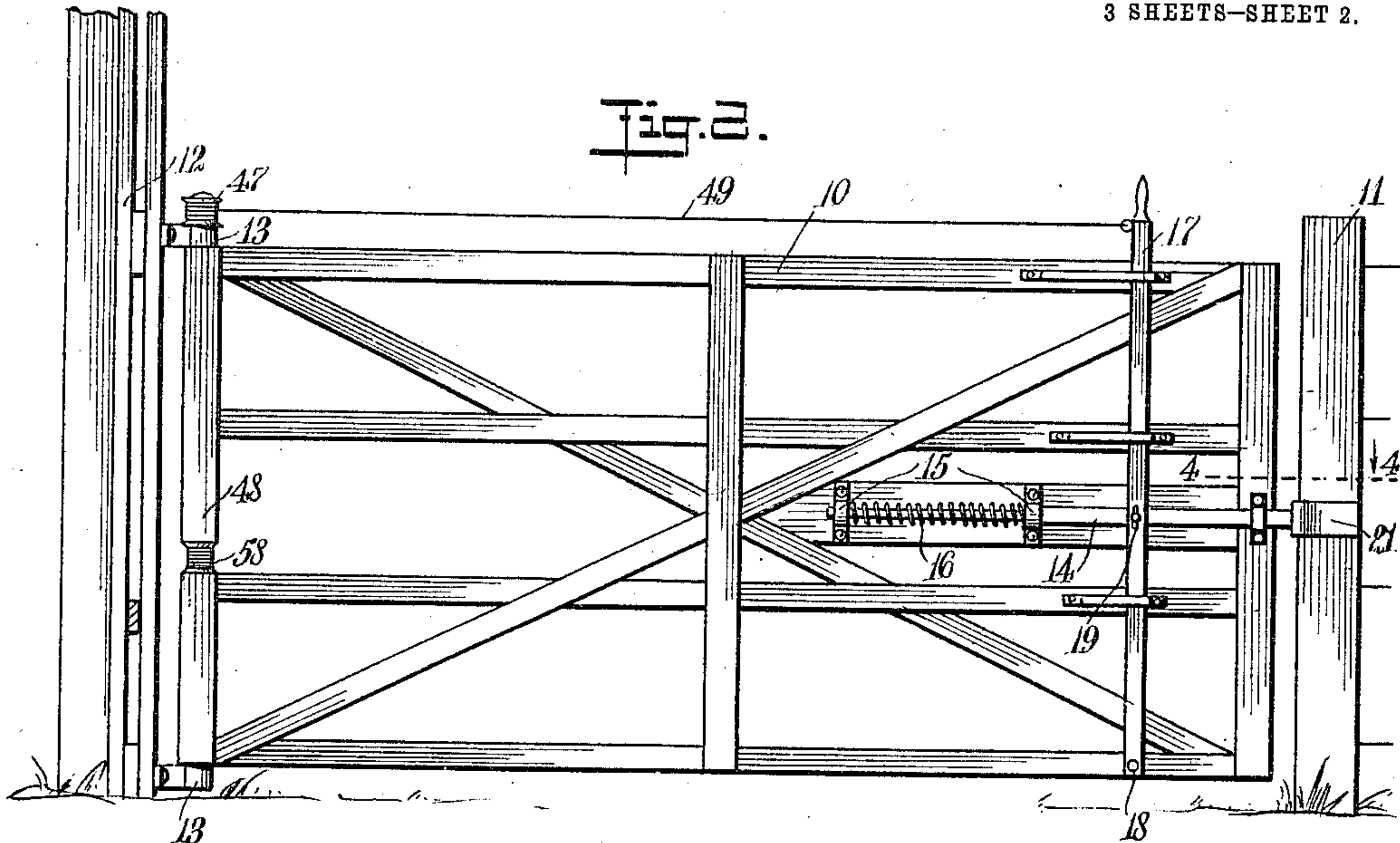


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3 SHEETS—SHEET 2.



WITNESSES:

[Signature]
[Signature]

INVENTOR
Louis H. Laas

BY

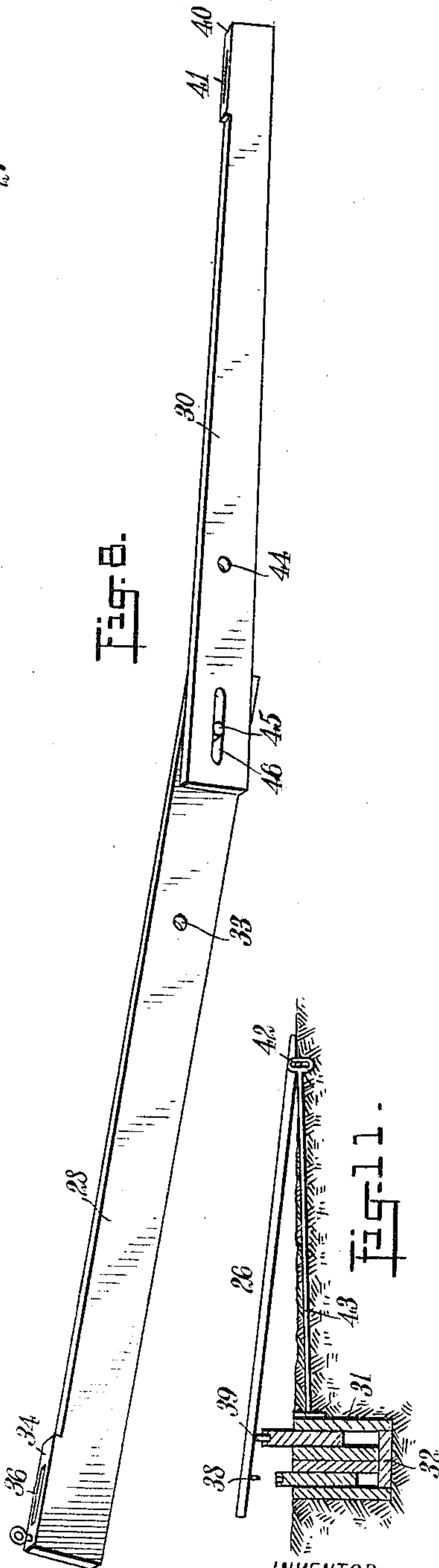
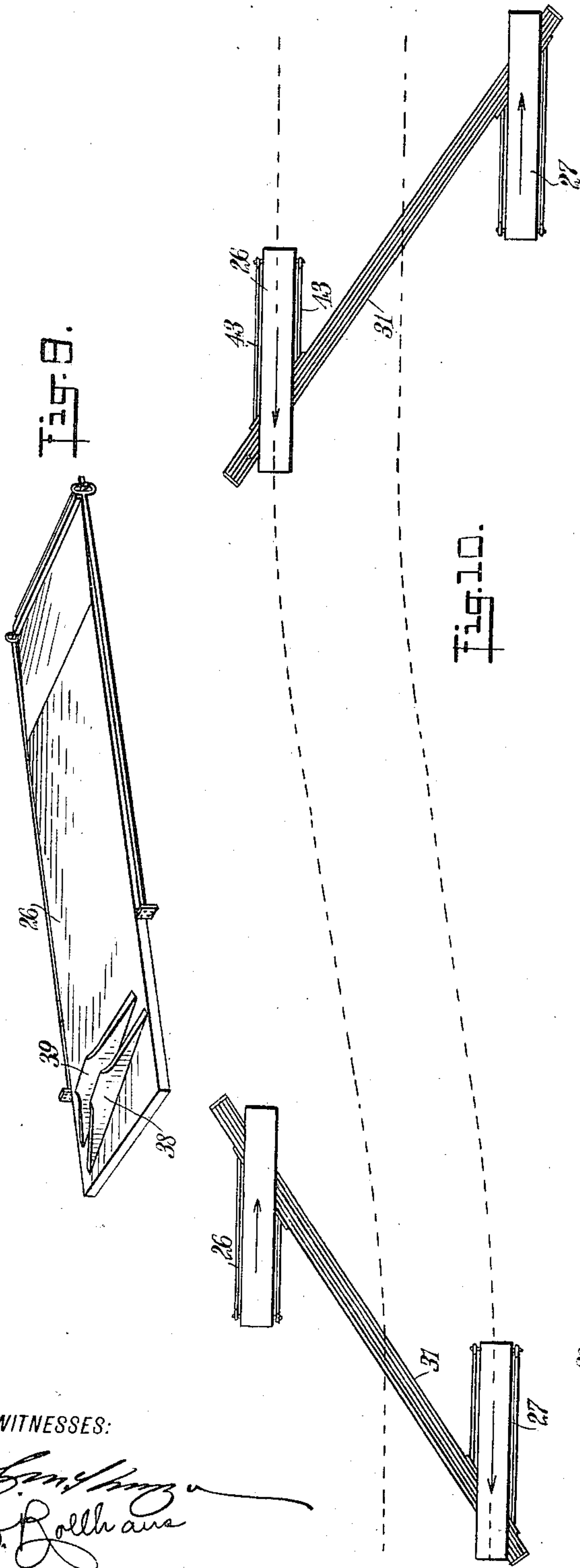
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ATTORNEYS

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Patented June 13, 1911.

3 SHEETS—SHEET 3



WITNESSES:
W. B. ...
A. D. ...

INVENTOR
Louis H. Laas
BY *...*
ATTORNEYS

UNITED STATES PATENT OFFICE.

LOUIS AUGUST LAAS, OF MAXWELL, TEXAS.

AUTOMATIC GATE.

995,262.

Specification of Letters Patent. Patented June 13, 1911.

Application filed July 23, 1910. Serial No. 573,445.

To all whom it may concern:

Be it known that I, LOUIS A. LAAS, a citizen of the United States, and a resident of Maxwell, in the county of Caldwell and State of Texas, have invented a new and Improved Automatic Gate, of which the following is a full, clear, and exact description.

This invention relates to automatic gates, and more particularly to gates that are unlatched and opened by a vehicle approaching along the road and closed and latched again through the same agency after the passage of the vehicle, all of which is done automatically as far as any intervention on the part of the occupant of the vehicle or any other person is concerned. Such gates have been devised heretofore, but they have not always been reliable in operation, and many of them employ a principle of construction which I have aimed to avoid, namely, they utilize the same vehicle-engaged road member for unlatching and opening the gate, when the vehicle is approaching, and for closing and re-latching the gate, when the vehicle has passed through the gate. While this arrangement may seem desirable from the standpoint of economy of parts, I find that as a matter of fact certain complications are likely to arise, such as the swinging of the gate past instead of merely to closed position after the vehicle has gone through, and holding of the latch in retracted position when the gate reaches closed position, so that the gate may fail to re-latch.

It is the object of the present invention to avoid such difficulties, and, in general, to devise an automatic gate of the type described, which will be reliable in operation, not easily deranged, and of a degree of simplicity of construction compatible with the attainment of the desired results.

One of the objects of the invention is to avoid encumbering the swinging gate itself with many or heavy operating parts.

To these ends, the invention consists in the parts, arrangements and combinations hereinafter described and in the claims more particularly pointed out.

Among the features of the invention may be mentioned the provision at each side of the swinging gate of separate vehicle-engaged road members, preferably in the nature of fulcrumed running boards, and preferably located at opposite sides of the

road, one of which controls the opening and the other the closing of the gate.

In the best form of the invention the first running board actuates two separate mechanisms, a latch-releasing mechanism and a gate-swinging mechanism, while the second running board actuates the gate-swinging mechanism only.

Another feature of the invention is the disposition of these fulcrumed running boards longitudinally of the road, with their fulcrumed portions remote from the gate, that is, toward the approaching vehicle, so that the vehicle wheel runs thereon without jar, and, owing to the sinking of the running board substantially to the ground level under the weight of the vehicle, rolls off the inner end of the running board also practically without jar.

Another feature of the invention that may be mentioned is the provision of lost-motion means whereby the running board that controls the opening of the gate, first actuates the latch-releasing mechanism and afterward the gate-swinging mechanism, so that the latch is released before force is applied to the gate to open it. In this way straining of the latch and of the gate and linkages and possible refusal or the gate to open, is avoided.

Many other features are included in the invention, as will become apparent as the specification proceeds.

In the accompanying drawings illustrating the invention by means of the preferred embodiment thereof: Figure 1 is a perspective view of the gate; Fig. 2 is an elevation of the swinging gate, showing the adjacent stationary parts; Fig. 3 is a detail sectional view of the latching means, taken on the line 4—4 of Fig. 2; Fig. 4 is a perspective view of one of the pit-casings and the ground levers contained therein, intermediate portions thereof being broken away for economy of space; Figs. 5, 6 and 7 are vertical transverse sections on the lines 6—6, 7—7, and 8—8, respectively, of Fig. 4; Fig. 8 is a detail perspective view of the gate-opening and closing levers connected together; Fig. 9 is a perspective view of one of the running boards upside down; Fig. 10 is a semi-diagrammatic view showing the arrangement of the pits, ground levers and running boards relative to the roadway; and Fig. 11 is a vertical sectional view across one end of one of the pits and longitudinally of the

coöperating running board, the parts being shown in their normal positions, that is, when the gate is closed and in readiness to be actuated by a vehicle.

5 In these views, the numeral 10 indicates a suitable swinging gate, the particular form of which may be varied as desired.

11 is a suitable latch post therefor, and 12 indicates a suitable form of combined
10 hinge gate post and upright supporting structure, the particular construction of which is not material. The gate is shown as hinged to the structure 12 by means of pivot bearings 13; but the gate may be
15 hingedly or pivotally supported in any desired manner.

Latching means are provided for holding the gate closed, consisting preferably of a retractable latch bolt and a spring keeper,
20 and preferably the bolt is mounted on the swinging gate and the keeper on the post 11. While the form of latch illustrated constitutes one of the features of the invention, as regards other features of the invention
25 the latching means may be widely varied. In the illustrated construction, a latch bolt 14 slides longitudinally in suitable bearings 15 on the swinging gate, and is normally projected by a spring 16. An unlatching
30 lever 17, convenient of manipulation by hand, is shown pivoted at 18 to the swinging gate, and connected with the bolt at 19, but any other suitable link may be connected to the bolt for the purpose of retracting the
35 same against the expansive force of the spring 16. A socket opening 20 is formed in the post 11 in alinement with the latch bolt 14. The keeper 21 consists of two spring leaves 22 secured by any suitable
40 means, such as bolts 23, to the post. At the inner face of the post, these spring leaves 22 have converging riding surfaces or portions 24, spaced away from the post, that are adapted to be forced back through rid-
45 ing contact with the forward end of the latch bolt, which is adapted to be received between the spaced leaves within the socket 20. Preferably, the spring leaves are provided with abutment wings 25, which ex-
50 tend rearwardly into said socket opening from the inner ends of the riding portions 24, being adapted to receive the side thrust of the latch bolt and to transmit it to the side of the socket opening.

55 In accordance with the invention, separate vehicle-engaged road members 26 and 27 are disposed at each side of the swinging gate, and preferably at opposite sides of the road, as shown in Fig. 10. The members 26
60 control the opening of the gate, and the members 27 the closing thereof. These road members, according to the best construction, are in the nature of running boards dis-
65 posed longitudinally of the road. Each running board 26 actuates separate gate-

swinging and latch-releasing mechanisms, the proximate portions of which are best embodied in ground levers 28 and 29. The running board 27 also actuates the gate-
70 swinging mechanism, through the inter-
mediate action of a ground lever 30, which is connected with the lever 28. The lever 28 will hereafter be referred to as the gate-
opening lever, the lever 29 as the unlatching
75 lever, and the lever 30 as the gate-closing
lever. Preferably these three ground levers at each side of the swinging gate are located in a pit 31, preferably disposed diagonally across the road, so as to allow of sufficient
80 length for the levers and at the same time to
locate the running boards 26 and 27 adjacent the opposite sides of the road, so that vehicles will not be obliged to deviate ma-
85 terially from their course in order to depress the running board. These pits 31 may be
provided with suitable trough-like, that is, long, narrow and shallow, casings 32, which are open at the top or said casings may be covered in any suitable manner, so as to
90 prevent water or dirt from entering the
bearings.

The unlatching and gate-opening levers 29 and 28 are disposed side by side in this casing, and may be mounted on a common
95 pivot 33. Normally the outer end portions
34 and 35 of these levers 28 and 29 project above the pit casing and above the road level, though this is not absolutely essential. The running board 26 is arranged to actu-
100 ate these levers preferably by having its end
nearest the swinging gate disposed over these projecting end portions 34 and 35, so that depression of the running board de-
presses the levers beneath. If desired, the upper edges of the portions 34 and 35 of the
105 levers may be provided with slots or sockets 36 and 37, and the underside of the running board 26 may be provided with projections 38 and 39 adapted to be received in these slots. In the preferred arrangement, the
110 projection 39 normally rests against the bot-
tom of the slot 37 of the unlatching lever 29, while the projection 38 is normally spaced from the bottom of the slot 36, whence it fol-
115 lows that lost-motion exists, and that the latch
releasing mechanism will be actuated before the actuation of the gate-swinging mech-
anism. The gate-closing lever 30 is also dis-
posed in the pit casing 32, and has an end
120 portion 40 adapted to be depressed by a ve-
hicle, but located at the opposite side of the road from the lever portions 34 and 35. The running board 27 is similar to the run-
ning board 26; but it need have only one
125 projection beneath, in place of the two pro-
jections 38 and 39, this single projection co-
operating with a slot or socket 41 formed in the portion 40 of the gate-closing lever. There is a further difference between the
130 running boards 26 and 27, in that the fulcra

of the running boards 26 are disposed away from the swinging gate, whereas the fulcra of the running boards 27 are disposed toward the gate, so that the elevated ends of the running boards are in all instances at the side away from the vehicle wheel that approaches to depress the running board, thus insuring easy riding of the wheel upon and from the running board. The running boards may be fulcrumed on pivot rods 42, carried by the outer ends of braces 43, the inner ends of which are secured to the pit casings 32.

The gate-opening lever 28 and the gate-closing lever 30 may be connected in a variety of ways, so that elevation of the lever 28 above normal elevates the lever 30, and subsequent depression of the lever 30 depresses the lever 28 to normal position. In the particular construction shown, the pivot 44 of the lever 30 is spaced longitudinally from the pivot 33 of the lever 28, and the two levers are connected intermediate their pivots by means of a pin 45 on one lever and a cooperating slot 46 on the other lever.

It is to be noted that the gate-closing lever 30 is normally substantially flush with the top of the pit-casing 32 or with the road level, as the case may be, whereas the gate-opening lever 28 normally projects above the road level. However, the essential feature of this relation between the parts is that the lever 28 is normally in position to be depressed by the running board 26 under the weight of a vehicle, whereas the gate-closing lever 30 is normally at the limit of vehicle-depression. In other words, if a vehicle approaching the gate runs on the running board 27 the lever 30 will not be actuated; but if the lever 28 at the far side of the gate has been elevated through the opening of the gate by the depression of the lever 28 at the near side of the gate, this elevation of the lever 28 above normal raises the connected lever 30 also, into position where it may be depressed by the vehicle after passing through the gate. Such depression of the lever 30 depresses the lever 28, not all the way down, but only to normal position, effecting closing of the gate. All of this will become clearer hereinafter. If desired, the levers in the pit casing 32 may be suitably separated and guided, as by means of longitudinal spacing pieces 32^a.

The remainder of the latch-releasing and gate-swinging mechanisms, the portions of which proximate to the running boards 26 and 27 and the levers 29 and 28 and 30, may be constructed in a great variety of ways. The constructions now to be described are desirable, and constitute features of the invention, but they may be altered in any desired manner without affecting the broader aspects of the invention.

A pulley 47 is shown mounted rotatably

on the pivotal portion or heel post 48 of the swinging gate, and a cord or the like 49 is shown connecting the unlatching lever 17 with the portion of the periphery of the pulley nearest this lever. Another flexible connection, or two flexible connections 50 are wound about the same pulley, in opposite directions, so that a pull on either connection 50 turns the pulley and winds the cord 49 thereon, thus retracting the latch bolt 14. These connections 50 are shown passing about pulleys 51, or other suitable guides for changing the direction of pull, mounted on posts 52 supported in the ground at opposite sides of the combined hinge post and supporting structure 12. The connections 50 thence pass upward and are secured adjustably, as by means of eye bolts 53, to the opposite ends of a lever 54, which is pivoted centrally on the supporting structure 12 and extends at opposite sides of the swinging gate. Sub-levers 55 are shown pivoted centrally on the posts 52 and having their inner ends connected with the lever 54, at opposite sides of the pivot thereof, by means of thrust links 56, pivoted to the levers 55 and the lever 54. The outer ends of the sub-levers 55 are shown connected to the projecting ends of the unlatching ground levers 29, by means of adjustable tension links 57.

A pulley 58 is shown fixed on the pivotal portion of the swinging gate, and having flexible connections 59 wound in opposite directions thereon, in such fashion that a pull on either swings the gate in the direction of the pull. These connections 59 are shown as passing about suitable pulleys or guides 60 on the posts 52 and thence upward to the lower ends of depending links 61, to which they are adjustably secured, as by means of eye-bolts 62. The said links 61 are shown as pivoted at their upper ends to the outer ends of a lever 63, which is pivoted centrally to the support 12 and extends at opposite sides of the swinging gate. This lever 63 may form the top member of a rocking frame, having also a bottom member 64. The outer ends of the bottom member 64 are shown as connected by adjustable tension links 65^a with the projecting ends of the gate opening levers 28.

As has already been stated, the proximate means for applying power to the latch, to retract the same, and to the gate to swing it, may be very widely varied. As, for example, racks and pinions may be substituted for the flexible connections and pulleys.

The operation of the invention will now be briefly described. A vehicle approaching the gate from either side is directed so that the wheel or wheels on the outer side thereof run over the running board 26. The first result is to depress the ground lever 29, thus rocking the corresponding sub-lever 55,

pushing on the link 56, rocking the lever 54, pulling on the flexible connection 50 at that side, turning the pulley 47, pulling on the cord 49, and retracting the latch bolt, so that the swinging gate is free to turn. The running board in its further descent now begins to actuate the ground lever 28, whereby the lever 63 is rocked. This produces a pull on the flexible connection 59 at the far side of the gate, thus swinging the gate open in a direction away from the approaching vehicle. This operation also results in raising the lever 28 at the far side of the gate above normal, which also raises the lever 30 at the far side above normal, as already described. The vehicle now passes through the gate, and its course is inclined toward the other side of the road, so that a wheel or wheels will run over the running board 27. Consequent depression of this running board depresses the levers 30 and 28, which as just explained are above normal position, back to normal position, thus closing the gate. The unlatching lever 29 is not actuated during this last operation, so that the latch bolt remains projected as the gate swings shut. The forward end of the latch bolt rides along one of the riding surfaces 24, whereby this riding surface is forced back against the spring of the metal, while the latch bolt is also forced back against the expansive force of the spring 16. The latch bolt thus enters the space between the abutment wings 25, being arrested by the far wing, and the distorted leaf 22 and also the bolt 14 are free to assume their normal positions.

Having thus described my invention, what I claim as new is:

1. In an automatic gate, the combination of a swinging gate, latching mechanism adapted to hold the same closed, a depressible road member, unlatching connections between said road member and said latching mechanism, and connections between said road member and the swinging gate, arranged to transmit the movement of said road member under the weight of a vehicle to said swinging gate so as to open the same, the last-named connections being independent of the unlatching connections and having lost motion, whereby the gate is unlatched before force is applied thereto to open the same.

2. In an automatic gate, the combination of a swinging gate, latching mechanism adapted to hold the same closed, a depressible running board, levers arranged adjacent to each other beneath the road bed and below said running board and adapted to be successively depressed thereby, unlatching connections between one of said ground levers and said latching mechanism, and gate-opening connections between the other ground lever and the swinging gate.

3. In an automatic gate, the combination of a swinging gate, latching mechanism adapted to hold the same closed, a depressible running board, a ground lever on which said running board rests, unlatching connections between said lever and said latching mechanism, a second ground lever adjacent to the first lever and spaced below said running board for lost motion and operated by said board upon further depression of the same, and gate-opening connections between the second lever and the swinging gate.

4. In an automatic gate, the combination of a swinging gate, latching mechanism adapted to hold the same closed, a depressible running board, ground levers arranged adjacent to each other beneath said running board and adapted to be depressed thereby, unlatching connections between one of said ground levers and said latching mechanism, and gate-opening connections between the other ground lever and the swinging gate, the relative arrangement of the running board and the ground levers being such that the ground levers are actuated successively, whereby the gate is unlatched before force is applied thereto to open the same.

5. In an automatic gate, the combination of a swinging gate, latching mechanism adapted to hold the same closed, parallel levers arranged side by side diagonally of and beneath the road bed, unlatching connections between one of said ground levers and said latching mechanism, gate-opening connections between the other ground lever and the swinging gate, and a depressible running board arranged longitudinally of the road and over the ground levers and successively operating said levers.

6. In an automatic gate, the combination of a swinging gate, a latch therefor, a pit, ground levers side by side in the pit, latch-releasing and gate-opening means actuated by said levers respectively, and a depressible running board disposed longitudinally of the road and having its portion nearer the gate disposed over said ground levers so as to depress the same, and being fulcrumed beyond the side of the pit remote from the gate.

7. In an automatic gate, the combination of a swinging gate, a latch therefor, a pit, ground levers side by side in the pit, the adjacent ends of said levers normally projecting above the top of the pit and provided with recesses, latch-releasing and gate-opening means actuated by said levers respectively, and a depressible running board disposed longitudinally of the road and having its portion nearer the gate disposed over the projecting ends of the ground levers and provided with projections engaging the recesses of said levers, and being fulcrumed at a point more remote from the gate.

8. In an automatic gate, the combination of a swinging gate, a latch therefor, a pit casing, ground levers side by side in the pit, latch-releasing and gate-opening means actuated by said levers respectively, supports secured to said pit casing and thence extending away from the gate, and a depressible running board disposed longitudinally of the road, having its portion more remote from the gate pivoted to said supports and its portion nearer the gate overlying said levers.

9. In an automatic gate, the combination of a swinging gate, a pair of ground levers extending across the road at each side of said swinging gate, each lever having a portion adapted to be depressed by a vehicle and said portions being at opposite sides of the road, one of said levers being a gate-opening lever and the other a gate-closing lever, connections between the gate-opening lever and the swinging gate so arranged that depression of said lever opens the gate, and means connecting the levers, whereby elevation of the gate-opening lever elevates the gate-closing lever and depression of the gate-closing lever depresses the gate-opening lever.

10. In an automatic gate, the combination of a swinging gate, a pair of ground levers extending across the road at each side of said swinging gate, each lever having a portion adapted to be depressed by a vehicle and said portions in each pair being at opposite sides of the road, one of the levers of each pair being a gate-opening lever and the other a gate-closing lever, connections between the gate-opening levers and the swinging gate, so arranged that depression of either gate-opening lever opens the swinging gate in a direction away from that lever and elevates the other gate-opening lever, means connecting the levers of each pair, so that elevation of the gate-opening lever elevates the corresponding gate-closing lever and depression of the gate-closing lever depresses the corresponding gate-opening lever, and means limiting the depression of each gate-closing lever by a vehicle, whereby the corresponding gate-opening lever is depressed only sufficiently to close the gate.

11. In an automatic gate, the combination of a swinging gate, a pair of ground levers extending across the road at opposite sides of the swinging gate, one lever of each pair being a gate-opening lever and the other a gate-closing lever, each lever having a portion adapted to be depressed by a vehicle and said portions in each pair being at opposite sides of the road, said portion of each gate-opening lever being normally in position to be depressed by a vehicle and said portion of each gate-closing lever being normally at the limit of vehicle-depression, connections between the gate-opening levers and the swinging gate, so arranged that depression

of either of said levers opens the swinging gate and further elevates the other gate-opening lever, and means connecting the levers of each pair, whereby such further elevation of the gate-opening lever elevates the corresponding gate-closing lever to position in which it may be depressed by a vehicle, and such depression of the gate-closing lever depresses the gate-opening lever back to normal position and closes the swinging gate.

12. In an automatic gate, the combination of a swinging gate, a pair of ground levers extending across the road at each side of said swinging gate, one lever of each pair being a gate-opening lever and the other lever being a gate-closing lever, the levers of each pair being fulcrumed intermediate their length and being connected intermediate their fulcra, whereby the elevation of the outer part of the gate-opening lever elevates the outer portion of the gate-closing lever and depression of the outer portion of the gate-closing lever depresses the gate-opening lever to normal position, and connections between the gate-opening levers and the swinging gate, so arranged that depression of either of said gate-opening levers by a vehicle swings the gate through a quarter turn but in opposite directions.

13. In an automatic gate, the combination of a swinging gate, a pair of ground levers extending across the road at each side of said swinging gate, each lever having a portion adapted to be depressed by a vehicle and said portions being at opposite sides of the road, running boards disposed longitudinally of the road and overlying said portions of the levers, one of the levers of each pair being a gate-opening lever and the other a gate-closing lever, connections between the gate-opening levers and the swinging gate, whereby depression of either lever opens the gate in a direction away from that lever and elevates the other gate-opening lever above normal position, and means connecting the levers of each pair, whereby depression of the gate-closing lever depresses the corresponding gate-opening lever to normal position and causes the latter to close the gate.

14. In an automatic gate, the combination of a swinging gate, a latch therefor, a pit extending across the road at each side of the gate, three levers disposed longitudinally in each pit, connections between one lever in each pit and said latch, gate-opening connections between another lever in each pit and the swinging gate, these two levers being arranged side by side, a running board overlying these two levers in relation thereto so as to actuate them successively, the third lever in each pit being connected to the gate-opening lever so as to actuate the same, to close the gate, and a running board overlying the third lever.

15. In an automatic gate, the combination of a swinging gate, a latch for holding the same closed, separate gate-swinging and latch-releasing mechanisms, a vehicle-engaged road member at each side of the swinging gate, for unlatching and opening the same and adapted to actuate both said mechanisms, and a separate vehicle-engaged road member at each side of the swinging gate for closing the same, connected with said gate-swinging mechanism and unconnected with said latch-releasing mechanism.

16. In an automatic gate, the combination of a swinging gate, a latch for holding the same closed, separate latch-releasing and gate-swinging ground levers at each side of the swinging gate, a running board at each side of the swinging gate, arranged to actuate both levers, a gate-closing ground lever at each side of the swinging gate, connected with said gate-swinging lever, and a running board at each side of the swinging gate, arranged to actuate said gate-closing lever.

17. In an automatic gate, the combination of a swinging gate having a fixed pulley on its pivotal portion, an upright stationary support adjacent said pivotal portion, a lever pivoted intermediate its length to said support and extending at opposite sides of said swinging gate, flexible connections attached at one end to the ends of said lever at opposite sides of its pivot and at the other end wrapped about said pulley in opposite directions, supports at opposite sides of the first named support, guides carried by said supports and changing the direction of pull of said flexible connections, depressed road members at opposite sides of the swinging gate, and connections between said road members and said lever.

18. In an automatic gate, the combination of a swinging gate having a fixed pulley on its pivotal portion, an upright stationary support adjacent said pivotal portion, a lever pivoted intermediate its length to said support and extending at opposite sides of said swinging gate, links depending from said lever at opposite sides of the pivot thereof, flexible connections connected at one end to the lower ends of said links and at the other end wrapped about said pulley in opposite directions, stationary guides changing the direction of pull of said flexi-

ble connections, depressible road members at opposite sides of the swinging gate, and connections between said road members and said lever.

19. In an automatic gate, the combination of a swinging gate having a fixed pulley on its pivotal portion, an upright stationary support adjacent said pivotal portion, a vertical rocking frame supported on said support and extending at opposite sides of said swinging gate, said frame consisting of a top member pivoted intermediate its length to said support, a bottom member, and side members extending between said top and bottom members, links depending from the ends of said top member, flexible connections attached at one end to the lower ends of said links and at the other end wrapped about said pulley in opposite directions, stationary guides changing the direction of pull of said flexible connections, depressible road members at opposite sides of the swinging gate, and connections between said road members and the opposite ends of the bottom part of said frame.

20. In an automatic gate, the combination of a swinging gate, a latch carried thereby, a wheel rotatably mounted on the pivotal portion of said swinging gate, operating connection between said wheel and said latch, an upright stationary support adjacent the pivotal portion of the swinging gate, a lever pivoted intermediate its length to said support, flexible operating connections between said wheel and said lever at opposite sides of the pivot of the latter, stationary guides for changing the direction of pull of said flexible connections, sub-levers fulcrumed intermediate their length, thrust links connecting the inner ends of said sub-levers with the first-named lever at opposite sides of the pivot thereof, depressible road members at opposite sides of the swinging gate, and tension links connecting said road members with the outer ends of said sub-levers.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LOUIS AUGUST LAAS.

Witnesses:

AUG. BEST,

A. L. ECKHARDT.