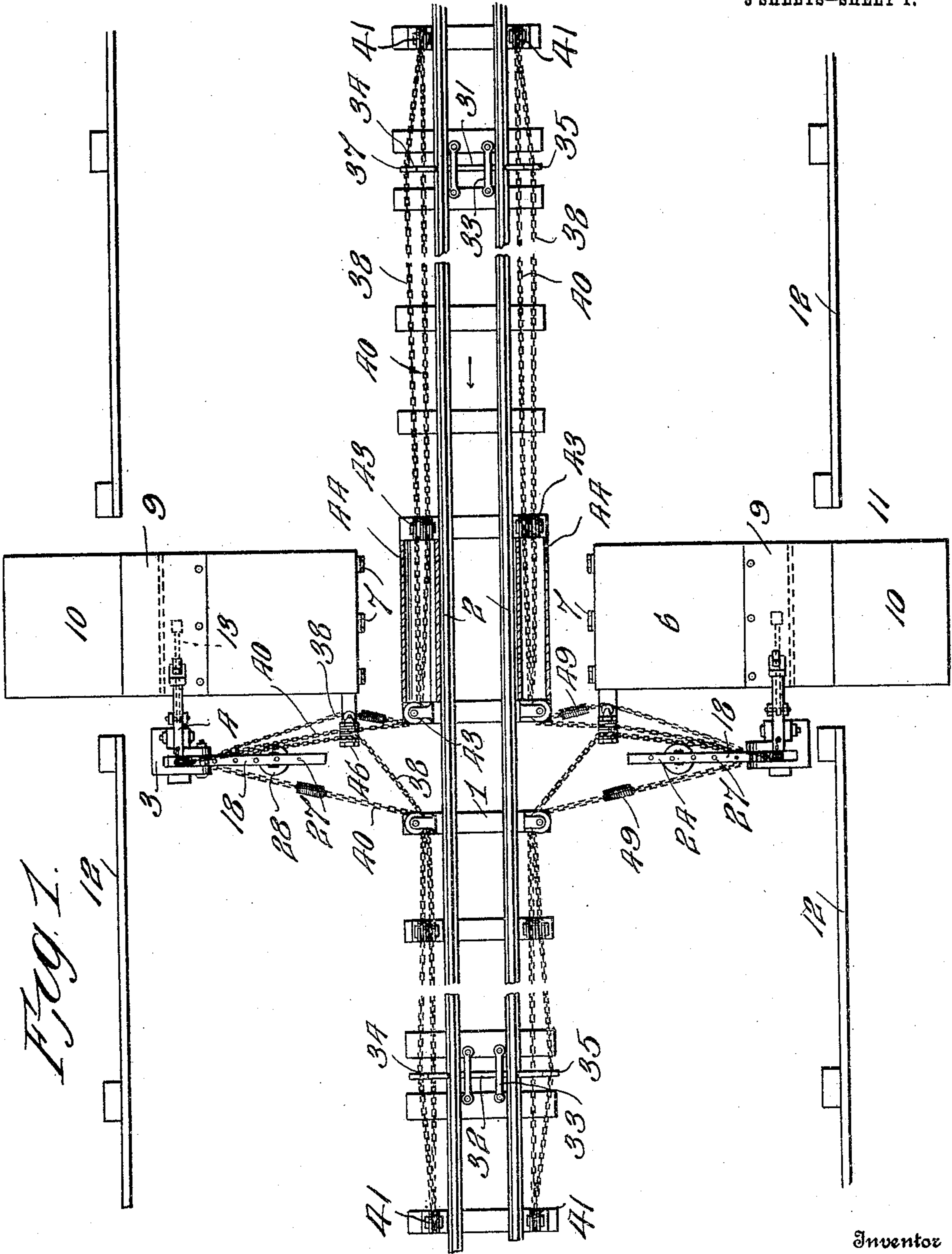


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 AUTOMATIC GATE.
 APPLICATION FILED NOV. 18, 1908.

932,473.

Patented Aug. 31, 1909.
 3 SHEETS—SHEET 1.



Witnesses
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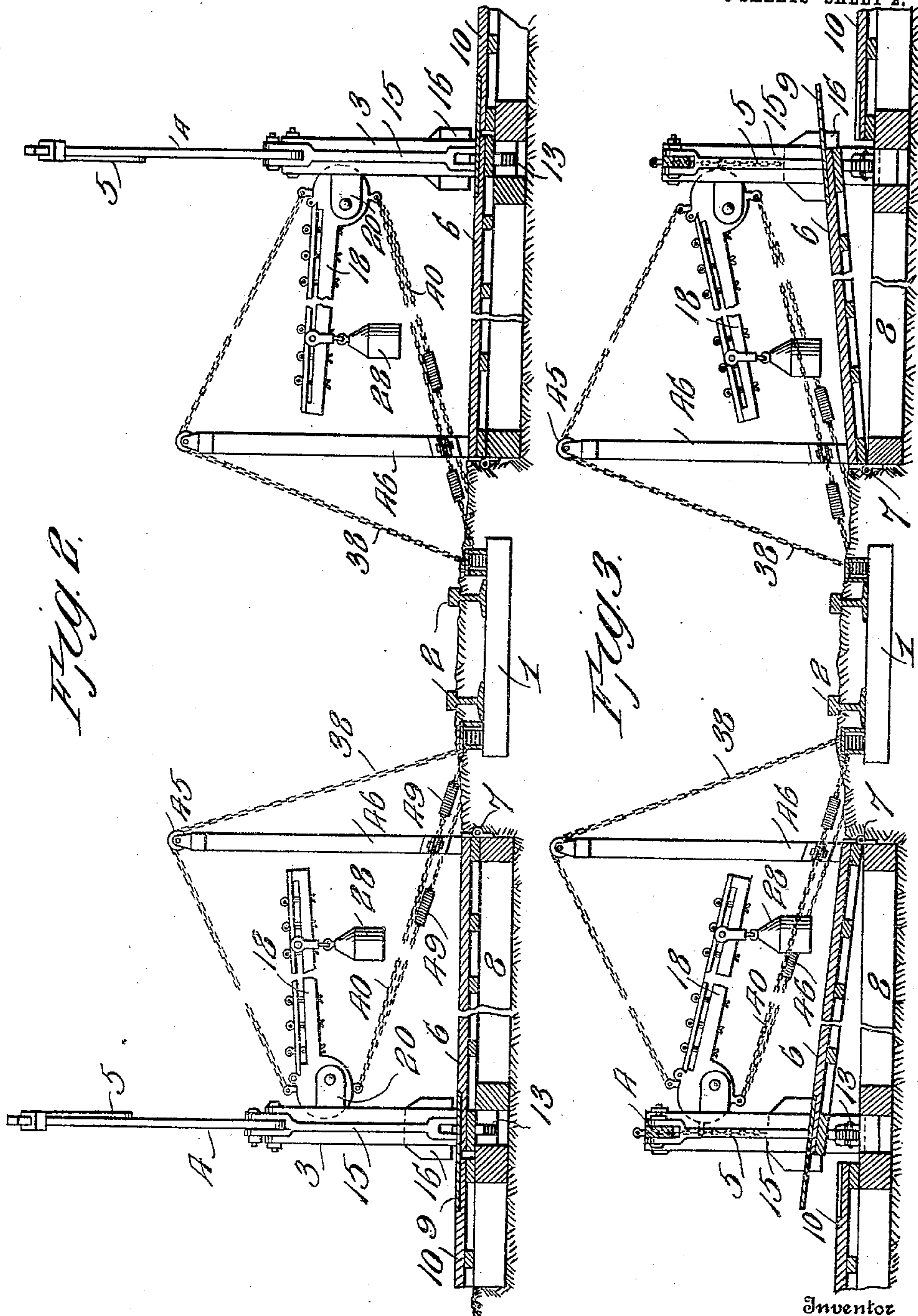
Inventor
 John W. Johnson,
 By Victor J. Evans
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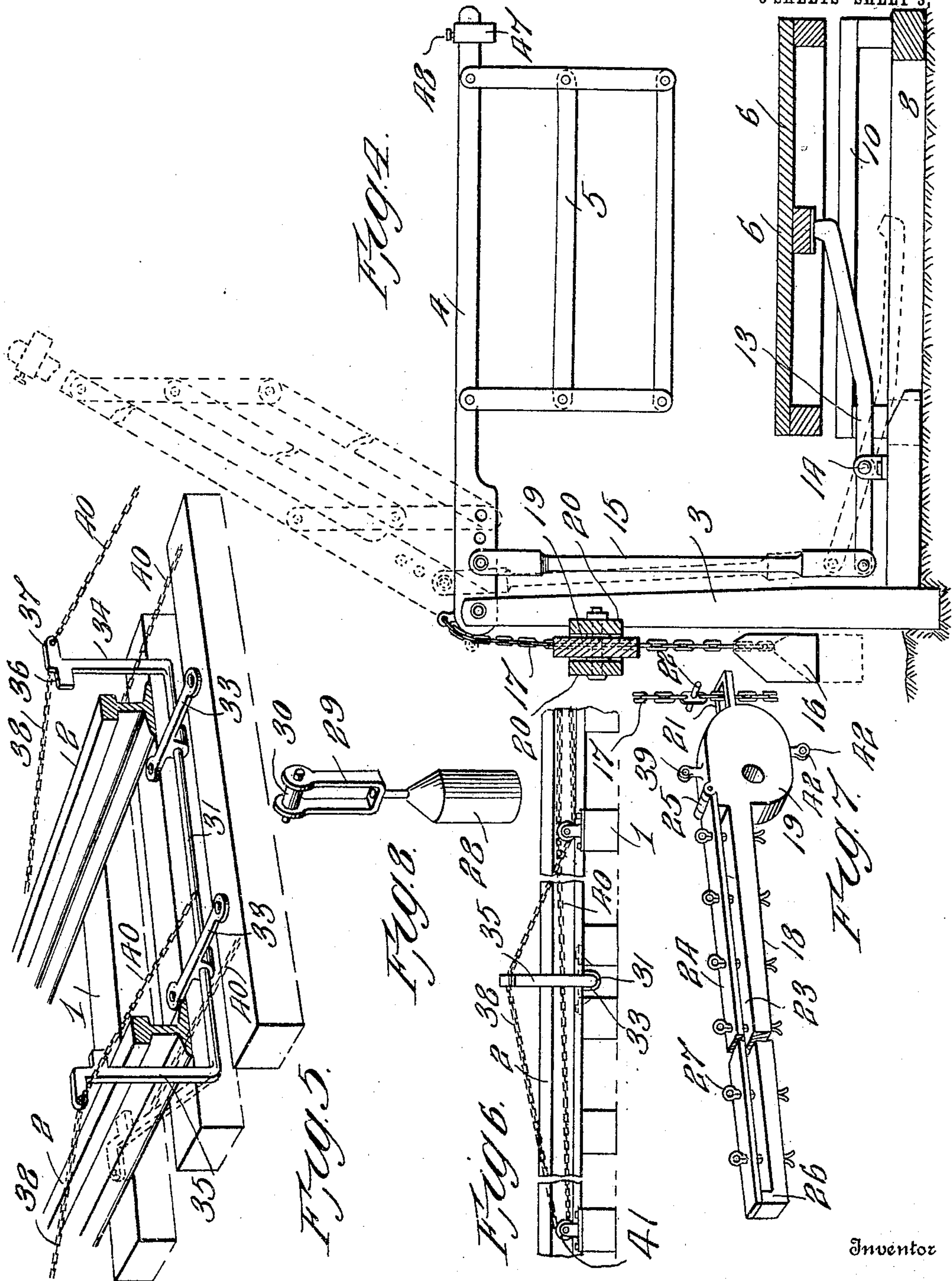
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3 SHEETS—SHEET 3.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN W. JOHNSON, OF CUSTER, OKLAHOMA.

AUTOMATIC GATE.

932,473.

Specification of Letters Patent. Patented Aug. 31, 1909.

Application filed November 18, 1908. Serial No. 463,276.

To all whom it may concern:

Be it known that I, JOHN W. JOHNSON, a citizen of the United States, residing at Custer, in the county of Custer and State of Oklahoma, have invented new and useful Improvements in Automatic Gates, of which the following is a specification.

This invention relates to automatic farm, railway crossing and like gates, the main object of the invention being to provide a crossing gate which will be automatically closed by a car, engine or train approaching the crossing in either direction and automatically opened when such car, engine or train passes a specified distance beyond the crossing, and which in addition is prevented from being closed when a person or vehicle is under the gate and is adapted to be opened independent of the controlling connections by the weight of a vehicle caught between the track and gate, so as to permit such person or vehicle to pass without injury.

A further object of the invention is to provide a railway crossing gate which is simple of construction, durable and efficient in use and comparatively inexpensive of installation; which dispenses with the use of a complication of parts so as to avoid liability of derangement under all ordinary conditions of service; and which embodies means for preventing injury to the operating devices in the event that reverse pulls should be exerted by two trains or locomotives simultaneously approaching from opposite sides of the crossing.

A still further object of the invention is to provide a gate of the character described which, in its essential features, is adapted for use as a farm or other like gate of the character designed to be opened by hand power as well as the weight of a vehicle passing through the gateway.

With these and other objects in view, the invention consists of the features of construction, combination and arrangement of parts hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a top plan view partially in section, of a railway crossing gate embodying my invention. Fig. 2 is a section through the crossing showing the gates in open position. Fig. 3 is a similar view showing the gates in closed position. Fig. 4 is a front elevation of one of the gates and a cross section through the tilting platform thereof,

showing the closed and open positions of the gate in full and dotted lines. Fig. 5 is a perspective view of a section of the track and one of the trip levers. Fig. 6 is a side elevation of the same. Fig. 7 is a perspective view of the gate operating lever and the connection between the same and the gate. Fig. 8 is a detail view of the shifting controlling weight employed upon the operating lever.

Referring to the drawings, 1 designates the ties and 2 the rails of the track at the road crossing to be protected. Gates embodying my invention are arranged at the opposite sides of the track in line with the road, each gate comprising a post 3 upon which is pivotally mounted a swinging arm 4 carrying a folding body or gate frame 5, which may be of any preferred structure. As shown in the present instance, the gate body or frame is formed of pivotally connected slats adapted to depend in the form of a guard from the arm when the latter is in lowered or horizontal position and to swing by gravity close to the arm when the latter is elevated to open the gate, as shown, respectively, in full and dotted lines in Fig. 4. The gate post is arranged at one side of a tilting platform 6 above which the gate is adapted to swing down to closed position, and over which platform, which is arranged in alinement with the roadway, vehicles and pedestrians pass. The platform is hinged or pivoted at its inner end, as shown at 7, to a suitable foundation frame 8, on which it is adapted to rest when in horizontal position. The outer end of the platform is provided with a joint plate 9 to overlap and fit within a recess in an outer stationary platform or approach section 10, so as to form a smooth passageway for the vehicle when the said pivoted platform 6 is depressed. The stationary platform sections at each side of the gateway extend beyond entrance ways 11 in guard fences 12 arranged on opposite sides of and parallel with the track and extending a suitable distance in either direction beyond the road crossing. The pivoted platform is provided on its underside with a bearing for the upwardly inclined or angular inner end of an operating lever 13 pivoted at 14 alongside said platform, the opposite end of which lever is straight and pivotally connected with the lower end of a rod or link 15, which in turn has an adjustable pivotal connection at its upper end with the inner pivoted end of

the swinging arm 4. The weight of the gate and pivoted platform is overbalanced by a controlling weight 16 attached to the lower end of a suspension or operating chain or flexible connection 17 hung from the pivoted end of the arm 4. This weight serves to normally hold the gate in closed position and the platform 6 tilted at an outward and upward incline so that its joint plate 9 lies above the approach 10. The weight of a person or the draft animal of a vehicle on the outer end of the pivoted platform will, however, serve to overcome the pull of the weight 16, whereby the platform will be depressed to form a flush runway and power will be transmitted through the connections 13 and 15 to open the gate. Provision is thus made to enable the gate to be opened for the passage of a pedestrian or train when the gate closing mechanism is operated by an approaching train, or to prevent closing of the gate under such conditions, so that the person or vehicle may pass without injury, as hereinafter described.

A gate operating beam, bar or lever 18 extends inwardly from the post 3 toward the track and is provided at its outer end with a head 19 eccentrically pivoted upon bracket plates 20 secured to the post, whereby said beam is adapted to swing in a vertical plane. The outer end of the head 19 carries a guide loop 21, through which the chain 17 extends, which chain is provided above said loop with a cross pin or projection 22 limiting the downward movement of the chain therethrough, and forming a slip joint connection between the beam and chain by which the gate may be relieved of the pull of the weight 16 and permitted to close, and by which also the gate is adapted when closed to be moved to an open position by the depression of the pivoted platform. The beam 18 is designed to be actuated by the controlling connections of a trip mechanism operated by the passing trains to open and close the gate and is provided in its upper side with a longitudinal recess 23 closed by a bar 24 hinged at its inner end thereto, as at 25, and adapted to rest at its inner end upon an upstanding lug 26 at the outer end of the beam. The beam and bar are perforated at intervals for the passage of split keys or other securing devices 27, by which the bar is held from movement on the hinge 25. A weight 28 carried by a yoke 29 having a cross pin or spindle 30 at its upper end is mounted on the beam and may be disposed in the space between any two adjacent pins 27, so that its position on the beam may be regulated. This weight under certain conditions opposes a resistance to the action of the weight 16 and is free to slide on the beam in the space between the pins between which it is confined so as to vary its action on the beam, as hereinafter described.

Rock shafts 31 and 32 are journaled in bearings 33 secured to the ties and extend transversely beneath the rails at suitable distances beyond the opposite sides of the crossing. Each of these shafts is provided at its ends with upwardly extending arms 34 and 35 of a length to extend vertically above the rails, each arm being formed at its upper end with an inwardly extending trip lug 36 adapted to overlie the adjacent rail and an outwardly extending projection 37. A chain 38 extends from the projection 37 of one arm of the shaft 31 to the beam 18 and is connected with an eye-bolt 39 at the top of the head 19 of said beam, while another chain 40 is connected with the projection 37 and passes rearwardly of the shaft over a guide pulley 41 and thence forwardly and is connected with an eye-bolt 42 on the underside of the head 19 of the beam. These chains extend in parallel relation along the adjacent side of the track and run in contact with suitable guide pulleys 43 and also through a suitable guide chamber or casing 44 alongside the track in line with the platform, whereby ease of motion of the chains is insured, as well as their protection from injury by vehicles passing at the crossing point over the track. The chain 38 also extends upwardly over a guide pulley 45 on a standard 46, by which it is properly arranged and guided for connection with the upper portion of the head 19. Similar sets of chains connect the corresponding arm of the rock shaft 32 with the head of the beam 18 on the same side of the track, while duplicate sets of chains connect the opposite arms 35 of the respective rock shafts 31 and 32 with the head of the beam 18 of the gate mechanism at the opposite side of the track.

In operation, a car, train or locomotive, running on the track from right to left in Fig. 1 will throw the rock shaft 31 forwardly by engagement of the front wheels with the trip lugs 36, by which the chains 40 will be drawn upon to swing the lever or beam of each gate mechanism downwardly, so that the loops 21 of said levers will engage the projections 22 of the suspension chains 17 of the gates and lift the weight 16, thus permitting the gates to drop to a closed position by gravity. In this operation of the beam 18 the weight 28 will shift inwardly thereon and supplement an added resistance to the weight of the gate to hold the same closed against the action of the weight 16. When the train passes beyond the crossing and engages the arms of the rock shaft 32, said shaft will be rocked forwardly and will draw upon the chains 38 to return the beams 18 to normal position, whereby the loops 21 will move downward and permit corresponding motion of the chains 17, by which the weight 16 will again act upon and swing the gates to open position. In this movement

of the beams 18 the weights 28 will also shift back to their normal position and decrease their leverage action on the beams 18, by which such weights will be caused to
 5 simply balance the resistance of the operating chains and connections to maintain the parts in such adjusted position. It will be understood that by the capacity of adjustment of the weight 28 on the beams 18,
 10 the parts may be adapted to operate with a desired amount of sensitiveness, and that the shifting movements of said weights provides for a proper distribution of the leverage action in the different positions of the
 15 beams so that said beams will have an accurate range of action. If desired, a counter-balance weight 47 may be adjustably mounted upon the free end of the bar or arm 4 of each gate so that its sensitiveness of balancing action under the operation of the weight
 20 16 may be regulated. This weight 47 may be secured in adjusted position by a set screw 48.

The normal position of the parts, in which
 25 both gates are open for traffic, is shown in Fig. 2. When the gates are closed by the action of a train passing in either direction the platforms 6 will be elevated to the position shown in Fig. 3 by the connections between
 30 the same and the gate arms 4, thus closing the gateway against the passage of pedestrians or vehicles through the guard gate entrances 11. If the trip mechanism should be operated by a train approaching the crossing
 35 while a person is standing upon the platform, or a vehicle is passing over said platform, the platform will remain depressed under the weight of the person or vehicle against the action of the weight 16, which operation is permitted by the slip joint connection 21 and 22, whereby closing of the gate
 40 and possible injury to the pedestrian or vehicle will be prevented. If a vehicle is crossing the track after having entered through
 45 one gate at a time a train is approaching and both gates are thrown to closed position thereby, the driver may continue on to the platform of the other gate which will be depressed in the manner described, whereby
 50 the gate will be opened under the weight of the vehicle and allow the same to pass and escape. It will thus be seen that while the gates are constructed and arranged to prevent a person or vehicle from entering from
 55 either side upon the approach of a train and the closure of the gates, simple and effective provision is made to prevent injury to a person caught upon a platform or a vehicle caught between the gates and to permit such
 60 person or vehicle to pass through the far side of the gateway without liability of injury.

It will be apparent from the foregoing description that the arrangement of the trip arms of the rock shaft and the controlling
 65 connections is such as to effect the operation

of the gates whether a train is running rapidly in either direction or backing slowly toward the crossing, and that safety is thus secured under all conditions. If by chance
 one train is running past the crossing while
 70 another is approaching the crossing and the two trains should simultaneously strike the arms of the opposite rock shafts 31 and 32, it will be understood that the reverse pulls upon the operating beams or levers thus
 75 caused would result in damage to the gate operating mechanism in the absence of means to prevent transmission of such strains to the levers. In order to provide for this contingency each chain is composed of a plu-
 80 rality of sections connected by one or more springs 49, which normally hold the chains taut to the desired degree and yet permit the chains to lengthen so as to prevent the transmission of reverse pulls upon the levers 18
 85 under the conditions stated. Hence, if a train traveling from left to right, for instance, and which has passed the crossing should strike the arms of rock shaft 31 at the same time that a train traveling in the same direc-
 90 tion strikes the arms of shaft 32, it will be understood that the springs will permit rocking movement of the lever 31 in the direction of movement of the first-named train, without
 95 straining or damaging the operating connections, and also without opposing the action of the approaching train in operating shaft 32 to close the gates and keep said gates closed until said approaching train passes the
 100 crossing and operates shaft 31 to open the gates. A corresponding action will take place when two trains are traveling in the reverse direction, or in the direction of the arrow in Fig. 1, as will be readily understood.

The gate may be employed as an auto-
 105 matic farm or like gate by simply dispensing with the rock shafts and operating chains referred to and substituting a suitable latch mechanism for holding the beam 18 in its gate opening and closing position and pro-
 110 viding suitable means on opposite sides of the gateway for controlling the latch mechanism, the weight of the person or vehicle being employed to effect an automatic movement of
 115 the gate to open position.

By a suitable modification of parts of the structure, the essential features of the gate may also be employed in the construction and operation of automatic gates for other
 120 purposes.

Having thus fully described the invention, what is claimed as new is:—

1. A gate mechanism comprising a vertically swinging gate, gravity-controlled means for opening the gate, a tilting plat-
 125 form disposed below the gate, a connection between said platform and the gate, and means whereby the gate may be opened by the depression of the platform independently
 130 of said gravity-controlled means.

2. A gate mechanism comprising a vertically swinging gate, gravity - controlled means for operating the gate, a gate-operating lever, a connection between said lever and the gravity-controlled operating means whereby the gate may be closed against the action of said means and the latter rendered inoperative to open the gate, a tilting platform below the gate, and a connection between the platform and gate whereby the latter may be independently opened upon the depression of said platform.

3. A gate mechanism comprising a vertically swinging gate, a counterbalance weight connected with the pivoted end of the gate and normally overbalancing the weight of the same to swing the gate to open position, a pivoted operating lever, a connection between the lever and weight whereby when the lever is moved in one direction the weight will be elevated and when the lever is moved in the reverse direction the weight will be released, and a balancing weight upon the lever.

4. A gate mechanism comprising a vertically swinging gate, a counterbalance weight connected with the pivoted end of the lever and normally overbalancing the weight of the gate to swing the same to open position, a pivoted operating lever, a connection between the lever and weight whereby when the lever is moved in one direction the weight will be elevated and when the lever is moved

in the reverse direction the weight will be released, a balancing weight shiftably mounted upon the lever, and means for shiftably mounting said weight at different positions upon the lever.

5. A gate mechanism comprising a vertically swinging gravity-closing gate, a counterbalancing weight suspended by a flexible connection from the pivoted end of the gate and normally operating to swing the gate to open position, a pivoted operating lever having a guide through which said flexible connection extends, said guide being arranged above the weight, and a projection upon the flexible connection adapted to be engaged by said guide, whereby in one movement of the lever the weight may be elevated.

6. A gate mechanism comprising a vertically swinging gravity-closing gate, a counterbalancing weight suspended by a flexible connection from the pivoted end of the gate and normally operating to swing the gate to open position, a pivoted operating lever having a guide through which said flexible connection extends, said guide being arranged above the weight, and a balancing weight shiftably mounted upon the lever.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN W. JOHNSON.

Witnesses:

JOHN L. FLETCHER,
R. M. SMITH.