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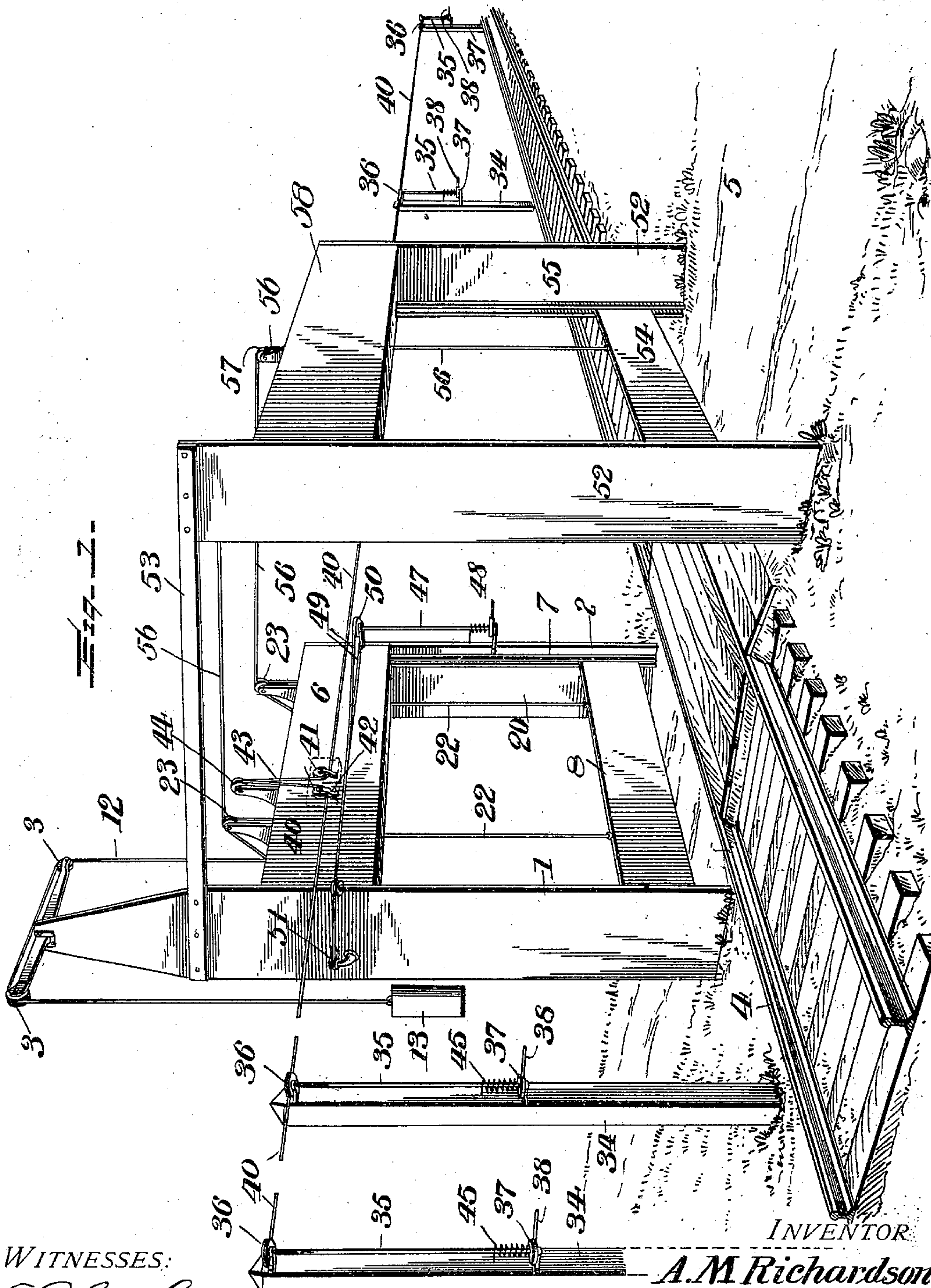
Patented Oct. 8, 1901.

A. M. RICHARDSON.
RAILWAY GATE AND SIGNAL.

(Application filed Nov. 23, 1900.)

(No Model.)

4 Sheets—Sheet I.



WITNESSES:

L. C. Mills
Clarence Shaw

BY

INVENTOR
A. M. Richardson

Thomas H. Hew
Attorneys

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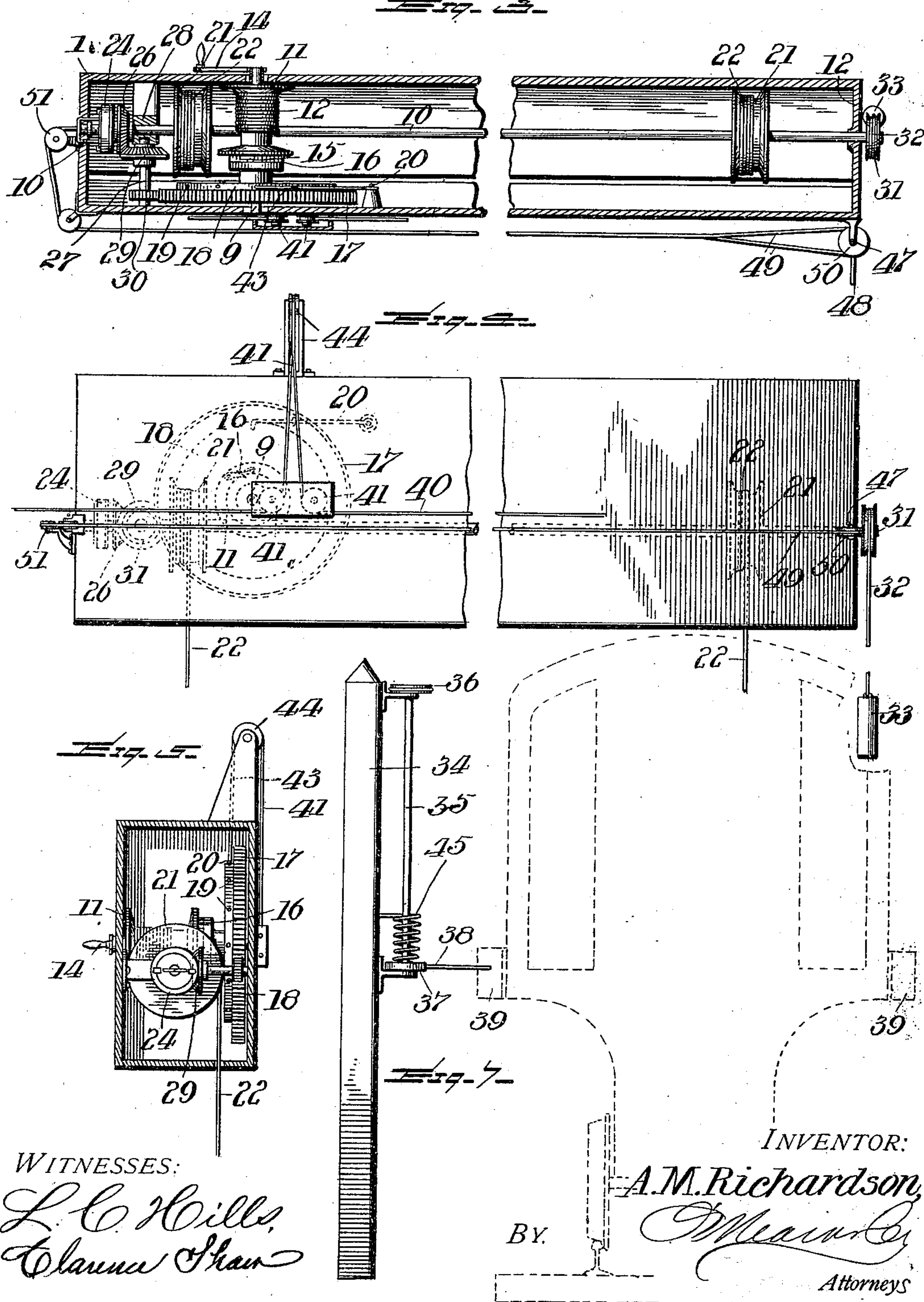
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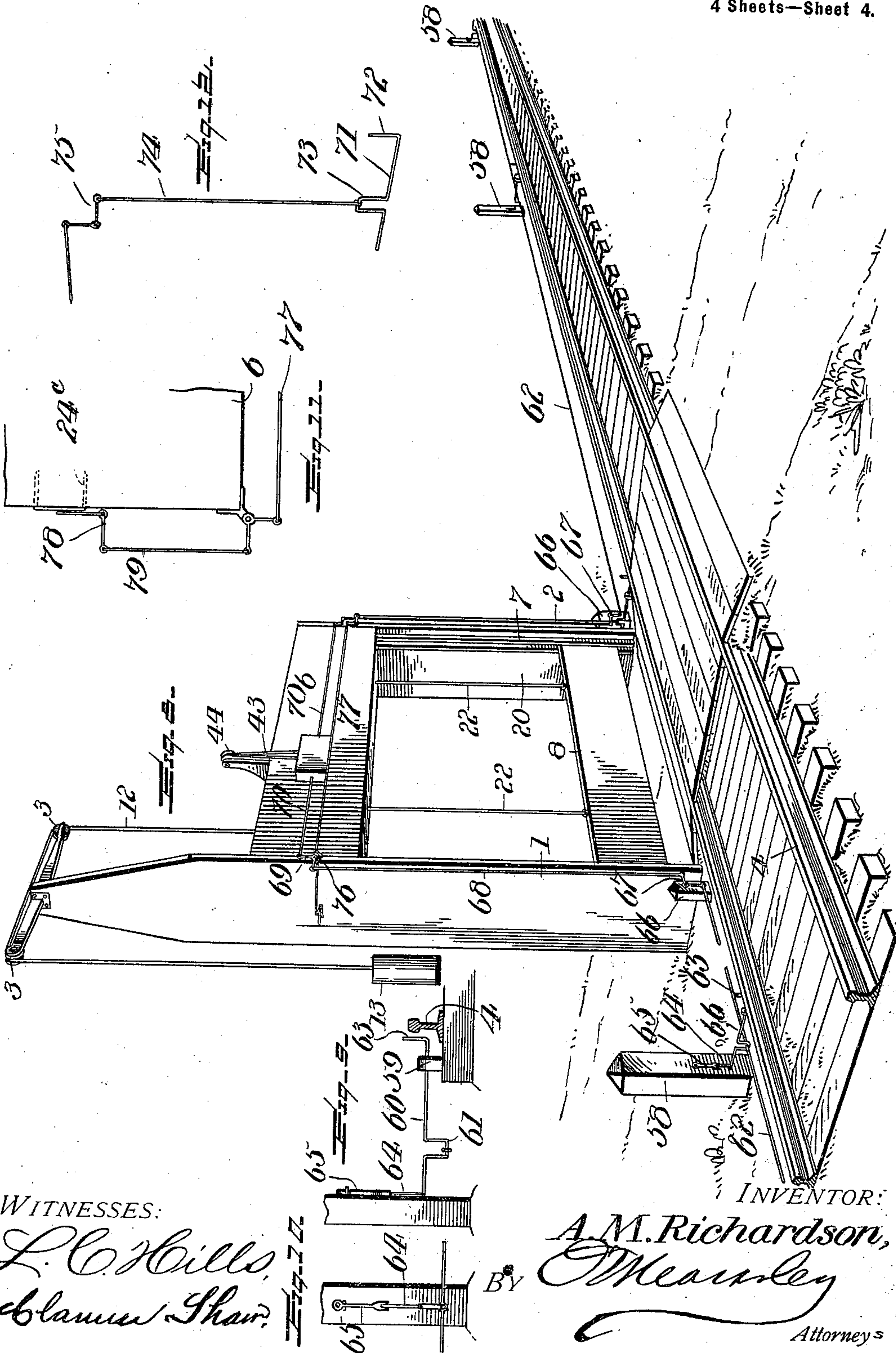
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WITNESSES:

L. C. Hills,
Clarence Shaw.

BY

A. M. Richardson,
Mearns
Attorneys

UNITED STATES PATENT OFFICE.

AUGUSTUS M. RICHARDSON, OF BOYNTON, GEORGIA.

RAILWAY GATE AND SIGNAL.

SPECIFICATION forming part of Letters Patent No. 683,986, dated October 8, 1901.

Application filed November 23, 1900. Serial No. 37,518. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS M. RICHARDSON, a citizen of the United States, residing at Boynton, in the county of Catoosa and State of Georgia, have invented a new and useful Railway Gate and Signal, of which the following is a specification.

My invention relates to automatic railway-signals, and has for its object to produce a device of this kind which can be located upon one or both sides of a railroad-track at the crossing or intersection therewith of a highway, as streets or roads, and which will automatically lower a signal across the highway, which will also act as a gate or bar to the passage of a person or team upon the track immediately before or during the passage of a train, and which will be automatically removed as soon as the train has passed.

With this object in view my invention consists in the improved construction and novel arrangement of parts of a safety-signal, as will be hereinafter more fully set forth.

In the accompanying drawings, in which the same reference-numerals indicate corresponding parts in each of the views in which they occur, Figure 1 is a perspective view of my improved signal applied to both sides of the track in the position the parts assume just before the train reaches the crossing. Fig. 2 is a similar view from the opposite side of the signal-operating mechanism, showing my invention arranged for one side of the road only. Fig. 3 is an enlarged top plan view of the signal-operating mechanism. Fig. 4 is an enlarged front elevation of the cross-piece 6, the mechanism supported thereby being shown in dotted lines. Fig. 5 is a vertical transverse sectional view through the cross-piece 6 and the mechanism supported thereby. Fig. 6 is a sectional detail view of the clutch mechanism for permitting the gates or signals to be returned to their original positions. Fig. 7 is a view looking along the track, showing the means for actuating the signal mechanism, the cab of an engine being shown in dotted lines. Fig. 8 is a perspective view showing a modification in the construction for tripping the signal, and Figs. 9, 10, 11, and 12 are detail views of various parts of said tripping mechanism.

Referring more particularly to the draw-

ings, 1 and 2 indicate two standards, which are of suitable height, and one of them, 1, is provided with a cross-arm, upon which are mounted suitable pulleys 3. The standards or posts are located adjacent to a railroad-track 4 upon opposite sides of a highway or crossing 5 and are spaced apart at their upper ends by means of cross-pieces 6. The cross-pieces are arranged at a sufficient height—say fourteen feet—to permit the passage of any ordinary load upon the highway. The standards may be of considerable width and the inner face of each provided with a groove or track 7, upon which a gate or barrier 8 may be moved up and down.

Journaled in the upper end of the frame formed by the standards and the cross-pieces are two shafts 9 and 10, upon one of which, 9, is loosely mounted a spool 11, on which is wound a cord 12, the intermediate portion of which is passed up over the pulleys 3 at the top of the standard 1 and to the free end of which is suspended a weight 13. The outer end of the axle of the spool is provided with a crank 14, by means of which the spool is rotated for winding up the cord, and a pawl 15 is secured to the inner end of the spool in position to engage with a ratchet 16 on the shaft. A gear-wheel 17 is rigidly secured to the shaft 9 at the end opposite the spool and is provided with a flange 18, on which are formed stops, as perforations 19. A detent 20 is pivotally secured at one end to the frame and has its free end bent at right angles to engage in said perforations.

The shaft 10 is provided with two pulleys 21, which are rigidly secured thereto and each of them provided with a cord 22, which is secured to the gate or barrier 8. One end of shaft 10 is provided with a clutch, one member 24 of which is mounted thereon so as to be movable longitudinally, but prevented from independent rotation. This member has on its rear side an annular ring 24^a, provided about its edge with a retaining-flange 24^b. Movable longitudinally through the supporting-frame for the signal mechanism is a U-shaped member 24^c, having the legs thereof secured to an annular plate 24^d, which is loosely retained in connection with clutch member 24 by the flange 24^b of said ring 24^a. An operating-rope, presently to be more fully

described, is secured to said U-shaped member 24^c and effects the longitudinal movement of the same and disengages clutch member 24 from a clutch member 25, which is loosely mounted upon the shaft and is provided with a bevel gear-wheel 26. A third shaft 27 is journaled in a bracket 28 and in the side of the casing and is provided at one end with a bevel-gear 29, which meshes with the wheel 26, and at the opposite end with a gear-pinion 30, which meshes with the gear-wheel 17. The end of the shaft 10 opposite the clutch mechanism is provided with a drum or pulley 31, upon which is wound a cord 32, to one end of which is attached a weight 33. The weight 33 is preferably but a slight degree heavier than the weight of the gates, so that but little force is necessary to operate the gates.

Located along the side of the track upon each side of the signaling apparatus are a number of posts 34, preferably two, which are arranged at suitable distances from each other and from the signaling apparatus—say two hundred yards. Mounted upon each of the posts in suitable bearings is a vertical shaft 35, preferably provided with a pulley 36 and a disk 37. An arm 38 is secured to the shaft by means of the disk or in any other suitable manner and has its free end normally extending over the track in position to be engaged by a bracket 39 or other suitable device upon the cab of the locomotive, there being two brackets upon the locomotive for the purpose of engaging with said arms with the locomotive traveling in either direction. A wire or connector 40 is secured to the upper pulleys upon each side of the signaling apparatus, and the inner end 43 of each of said wires passes over the roller 41, which is journaled in a suitable bracket 42 in front of the signaling apparatus, and up over a pulley 44, journaled above the top of the front cross-piece 6, and extends down within the frame, and is secured in any desired manner to the detent 20. Any suitable means—as, for instance, a coil-spring 45—may be connected with each of the shafts 35 for returning said shafts to their normal position after they have been rotated by the engagement with the free end of the arm 38 by the bracket upon the locomotive. If desired, a track 46 or means for supporting the wire 40 between the posts and the signaling apparatus may be stretched from the tops of the posts to the standards.

Journaled in bearings upon one of the standards is a vertical shaft 47, the lower end of which is provided with an arm 48, which normally extends out over the track in position to be actuated by the bracket upon the cab, and the upper end is provided with two cords 49, which are wrapped around a pulley 50 in opposite directions. The opposite ends of said cords pass over a pulley 51, adjacent to the clutch, and are connected with the clutch member 24, so that when the arm 48 is swung

in either direction said clutch member will be drawn out of engagement with the member 25, which will release the shaft 10 and permit the weight 33 to descend, and thereby raise the gates or barriers 8.

When it is desired to place a gate or barrier upon each side of a railroad-track, two additional standards 52 are arranged upon the opposite side of the track and connected with the first-mentioned standards by means of cross-pieces 53, which are arranged at such a height as to permit the passage of the ordinary train. A barrier or gate 54 is arranged to slide in a suitable track 55 in the same manner as heretofore described for the gate or barrier 8. Two cords 56 extend from said gate or barrier up over pulleys 57 and 23 and are connected at their opposite ends to the pulleys 21 upon the shaft 10, or additional pulleys may be provided therefor. The gates or barriers may be provided with any suitable notice, as "Train approaching, keep off the track," to give notice to any one approaching the railroad-track from either direction. The cross-piece 58 at the upper ends of the standards 52, as also the cross-piece 6 upon the standards 1 and 2, is of sufficient width to entirely cover the gates or barriers when they are at their upper limit, and thereby indicate that the track is clear or that the train is not within a specified distance of the crossing, the outermost post being located at a sufficient distance from the crossing to permit of a passage being made across the track at any time before the gate or barrier is lowered.

In using my improved signal apparatus it is erected at the crossing and the posts secured along the side of the track in any desired manner. The weight 13 is raised to its extreme limit by means of the crank upon the end of the cord-spool and held in that position ready for use. Upon the approach of a train from either direction the bracket upon the locomotive engages with the first arm and rotates its shaft, whereby the wire or cord connected therewith is moved longitudinally, so as to rotate one of the rollers at the signal apparatus and release the detent from the flange upon the main gear-wheel. This will cause the main wheel to rotate the pinion and with it the bevel gear-wheel, which meshes with the gear-wheel upon the shaft controlling the gates or barriers, and thereby causing said shaft to rotate in such manner as to unwind the cords supporting the gates or barriers and to wind up the small weight suspended from the pulley at the end of the shaft. This rotation will continue until the main wheel is stopped by the engagement therewith of the detent, which is preferably so arranged as to permit of a descent of the gates by gravity for every movement—say five or six feet, as the case may be. As soon as the train reaches the second post from the end, as there may be as many posts arranged along the track and at such distances apart

as may be desired, its vertical shaft is rotated by the engagement of its arm by the bracket of the cab and the detent is again withdrawn from the flange of the main wheel and the gates or barriers are caused to make a second descent, preferably five or six feet, the same as before. By the time the locomotive has reached a point about two hundred yards from the crossing the gates or barriers will have been lowered to their extreme limit, preferably about four feet from the ground, which will prevent access being had to the track by a team. When the locomotive reaches the crossing, the bracket upon its cab will engage with the arm of the shaft journaled in one of the standards and will rotate it sufficiently to cause one or the other of the cords at its upper end to engage with the longitudinally-movable clutch member on the shaft and disconnect it from the loose member. As soon as the clutch is disconnected the small weight upon the opposite end of the shaft will immediately rotate the shaft and the pulleys thereon, so as to wind up the cords, and by the time the train has passed raise up the gates or barriers behind the cross-pieces, and thus indicate that the track is clear. The cords along the sides of the track are so connected with the vertical shaft that when the train approaches from either direction the detent will be disconnected from the main wheel and the gates or barriers be lowered; but the movement of the arms in the opposite direction after the train has passed the crossing will only slacken the cord without effecting the operation of the signaling mechanism; but by connecting the cords from the clutch mechanism with the shaft at the side of the signaling apparatus, so as to disconnect the clutch when the shaft is rotated in either direction, the passage of the train from either side will release the clutch mechanism and permit of the raising of the gates or barriers.

Instead of providing a tripping mechanism to be operated by a bracket secured upon the cab of the locomotive said mechanism may be so constructed and arranged as to be operated by the wheels of the locomotive. To effect this, instead of the tall uprights 34 a series of short posts 58 are provided, and mounted at one end in said posts and at their opposite ends in suitable supports 59, fixed upon the ties, are shafts 60, provided intermediate their ends with cranks 61, to which an operating wire or cable 62 is connected, said cable running parallel with the track. The shafts have their outer ends turned upwardly to form arms 63, which are engaged by the wheels of the locomotive to effect the rocking of the shafts. The inner ends of said shafts are also provided with arms 64, which at their upper ends extend between the bifurcations of a spring-arm 65, secured at its upper end to each post 58. This spring-arm serves to return the shafts to their nor-

mal positions when rotated in either direction. Adjacent to the gate short posts 66 are positioned, upon each of which a bell-crank lever 67 is mounted. To one arm of these levers the inner ends of the operating-cable 62 are secured. To the opposite arms an upwardly-extending cable or rod 68 is connected, the opposite end of said rod or wire being connected with one arm of a bell-crank lever 69, mounted upon the upper portions of standards 1 and 2. To the other arms of said bell-crank levers 69 cables 70 are attached, said cables at their inner ends being attached to the pulleys 41. A shaft 71 is mounted at its inner end in one of the posts 66, said shaft being formed at its outer end with an arm 72, which is engaged by the wheel of the locomotive and operated to effect the rotation of the shaft. Said shaft is formed with a crank 73 intermediately of its ends, and to this crank an upwardly-extending rod 74 is attached, said rod being connected at one end with the crank of the shaft and at its opposite end with one arm of a bell-crank lever 75, pivotally mounted upon one of the standards. A bell-crank lever 76 is pivotally mounted upon the opposite standard or upright, and connecting these two bell-crank levers is a rod or cable 77. Pivotally mounted adjacent to the rear end of the U-shaped member 24^c of the clutch is a bell-crank lever 78, which has one of its arms connected with said member, so as to effect the longitudinal movement thereof, and its other arm connected with one of the arms of bell-crank lever 76 by a rod 79. The above-described mechanism effects the tripping of the mechanism by the action of the car-wheels, as will be readily understood.

As above described, it will be seen that by means of my improved signaling apparatus notice of the approach of a train is automatically given without the necessity of the care or attention of any person except an occasional winding of the spool by means of the crank, which can be readily attended to by an assistant whose presence will only be required at certain intervals after the passage of a certain number of trains.

Although I have shown what I consider the most desirable form of constructing my improved signaling apparatus, yet it is evident that changes and alterations can be made therein, and I reserve the right to make such changes and alterations as will come within the scope of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a railway-gate, the combination with a shaft, of a gravity-gate, ropes connected with said gate and adapted to be wound upon the shaft, a detent normally holding said shaft from rotation in one direction, and a plurality of tripping devices disposed along the track and connected with said detent and

adapted to successively operate the same to permit the shaft to rotate sufficiently at each tripping thereof to permit the gate to accomplish a part of its downward movement, substantially as described.

2. In a railway-gate, the combination with a shaft, of a gravity-gate, ropes connected with said gate and adapted to be wound upon the shaft, a plurality of stops for stopping the rotation of the shaft with the gate at different points in its downward movement, a detent for engaging said stops, and a tripping mechanism disposed along the track in position to be engaged by the train and having an operative connection with said detent for successively operating the same to disengage the stops, substantially as described.

3. In a railway-gate, the combination, with a frame, of a weight-actuated shaft journaled therein provided with a clutch mechanism at one end and pulleys upon its intermediate portion, operating mechanism detachably connected with said clutch mechanism for rotating the shaft in one direction and raising the weight, a series of shafts arranged along the side of the track, each of which is provided with an arm normally extending above the track, one of said arms being connected with the clutch mechanism so as to release the clutch when rotated in either direction, and the other shafts being connected with the operating mechanism so as to permit of its operation when said shafts are rotated in one direction only, substantially as described.

4. In a railway-gate, the combination, with a frame, of a shaft journaled therein provided with clutch mechanism, two pulleys, and a weight, movable gates connected with said pulleys, a shaft journaled in said frame at right angles to the first-mentioned shaft, mechanism for connecting said shaft with the rotatable member of the clutch, means for rotating said second-mentioned shaft in one direction, a detent for preventing said rotation, tripping devices along the track upon opposite sides of said frame, means for operating the clutch mechanism by one of said tripping devices, and means for connecting the detent with the other devices, substantially as described.

5. In a railway-gate, the combination, with a frame, of two shafts journaled therein, each of which is provided with a weight for rotating it in one direction, and one of them with two pulleys and a clutch mechanism, movable gates connected with said pulleys, bevel-gears connected with the loose member of said clutch, a gear wheel and pinion for operating said bevel gear-wheels, a detent for preventing the rotation of the shaft provided with the gear-wheel, tripping devices at the side of the track, one of which is connected with the clutch mechanism and the

others are connected with the detent, substantially as described.

6. In a railway-gate, the combination, with a frame, of two shafts journaled therein, each of which is provided with a weight and one of them with two pulleys and a clutch mechanism, movable gates connected with said pulleys, bevel-gear connected with the loose member of the clutch, a gear wheel and pinion for operating the bevel-gear, the gear-wheel being provided with stops, a detent for engaging with said stops, a pulley and two rollers connected with the frame, cords connected with the detent at one end and with the rollers at the other and having their intermediate portions passed over the pulley, tripping devices along the track, one of which is connected with the clutch mechanism and the others are connected with the rollers, substantially as described.

7. In a railway-gate, the combination, with a frame, of two shafts journaled therein, one of which is provided with a clutch mechanism, two pulleys and a weight, and the other one with a spool-and-ratchet mechanism, a weight connected with said spool, means for winding up said weight, a train of gearing between one of said shafts and the loose member of the clutch mechanism, the main wheel of which is provided with a plurality of stops, a detent in position for engaging with said stops and stopping its rotation, a cord connected with said detent, tripping devices, along the track, one of which is connected with the clutch mechanism and the others are adapted to operate said cord and detent, substantially as described.

8. In a railway-gate, the combination, with standards, each of which is provided with a vertical track and one of them is higher than the other, cross-pieces upon said standards, forming therewith a frame, shafts journaled in said frame, means for winding cords upon said shafts, clutch mechanism upon one of said shafts, means for detachably connecting the other shaft therewith, vertically-movable gates in the tracks of the standards, connected with two of the cords upon one of said shafts, a weight upon each of the other cords, one of said cords passing over pulleys at the top of the higher standard, means for manually winding up the cord over the top of said higher standard, releasing mechanism for permitting of the unwinding of said cord, and tripping devices along the track, one of which is connected with the clutch mechanism, and means for connecting the remaining devices with said releasing mechanism, substantially as described.

AUGUSTUS M. RICHARDSON.

Witnesses:

SAM P. MADDUX,
W. M. JONES.