(No Model.) 4 Sheets—Sheet 1.

B. HABERTHUR.

ELECTRICALLY OPERATED RAILWAY GATE.

No. 556,183. Patented Mar. 10, 1896.

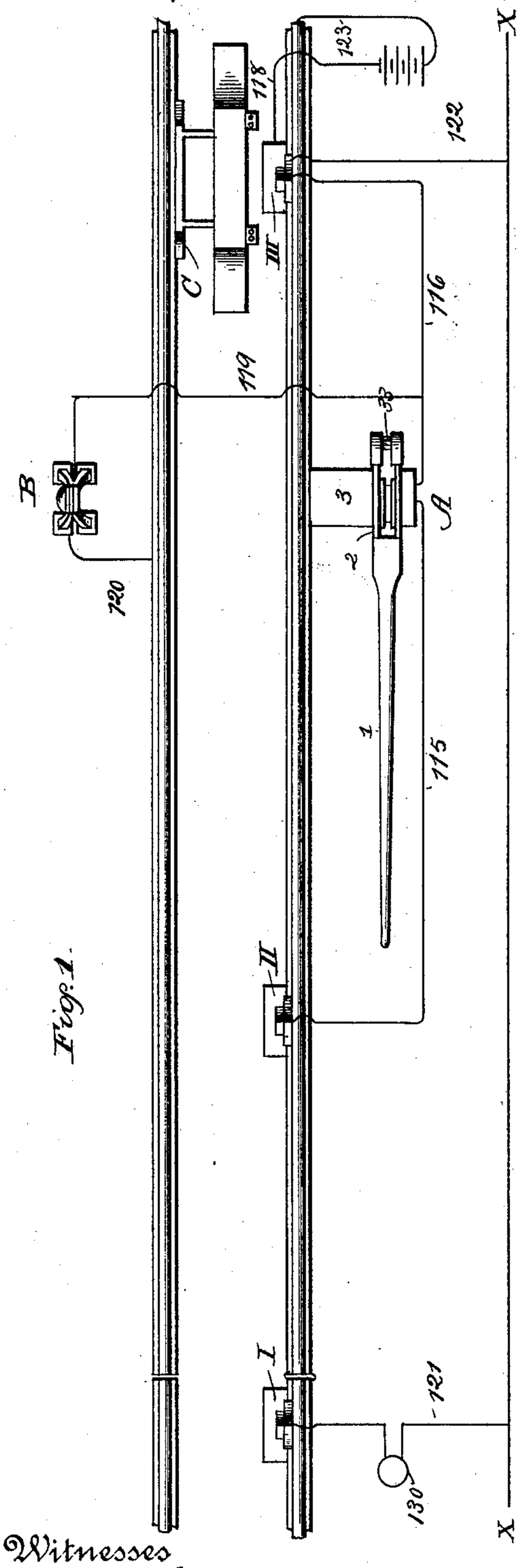

Fig. 1.

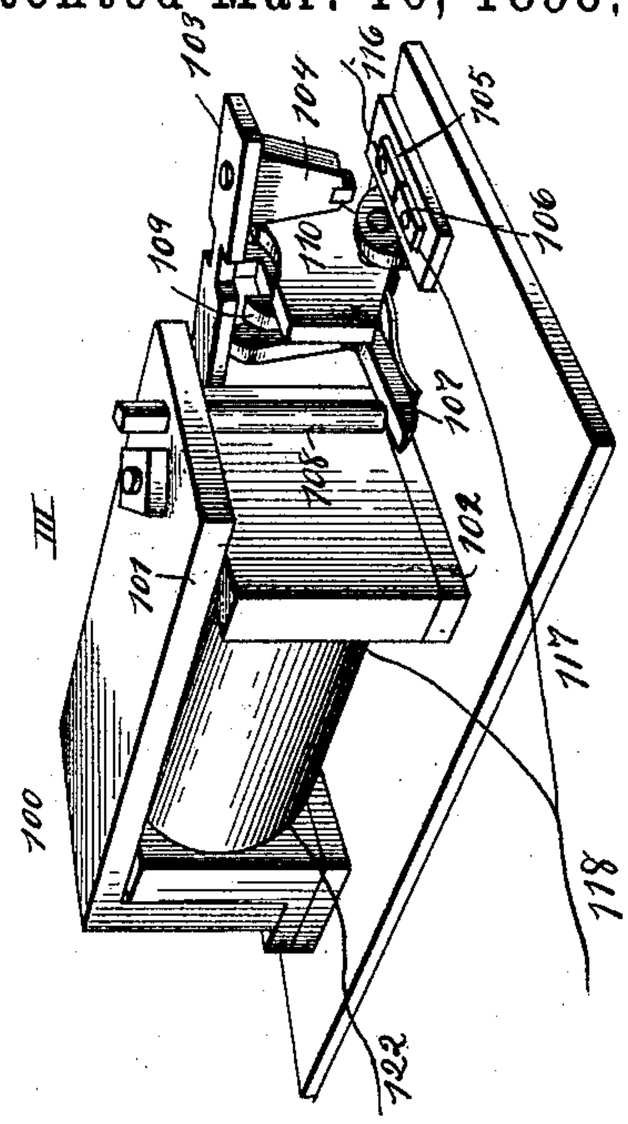

Fig. 15.

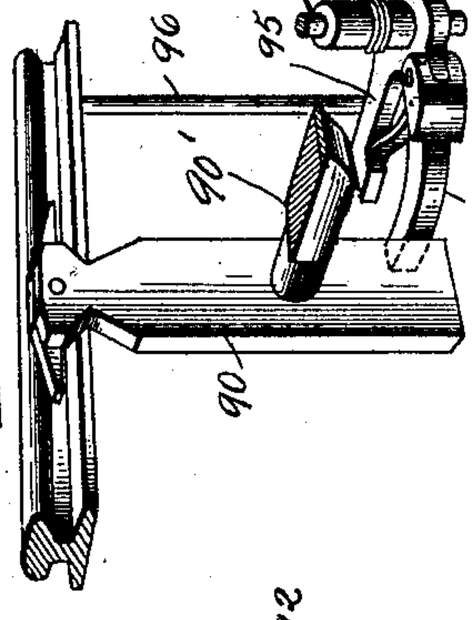

Fig. 14.

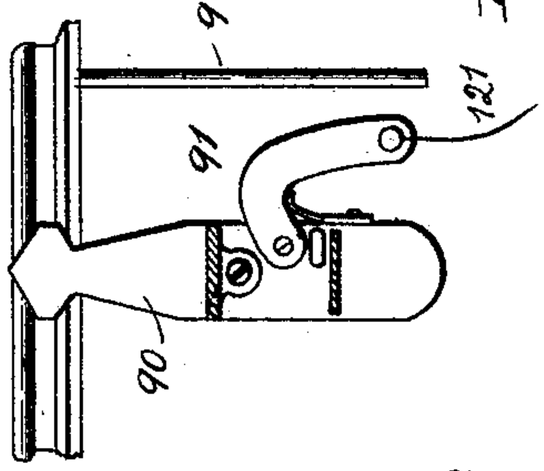

Fig. 13.

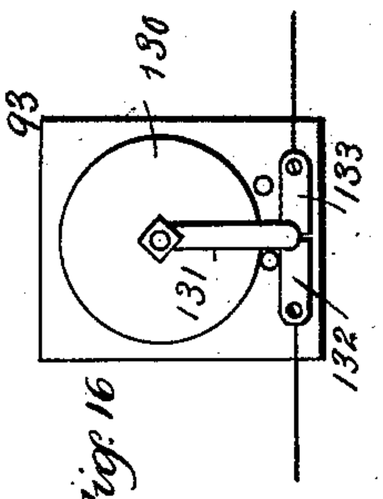

Fig. 16

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ELECTRICALLY OPERATED RAILWAY GATE.

No. 556,183. Patented Mar. 10, 1896.

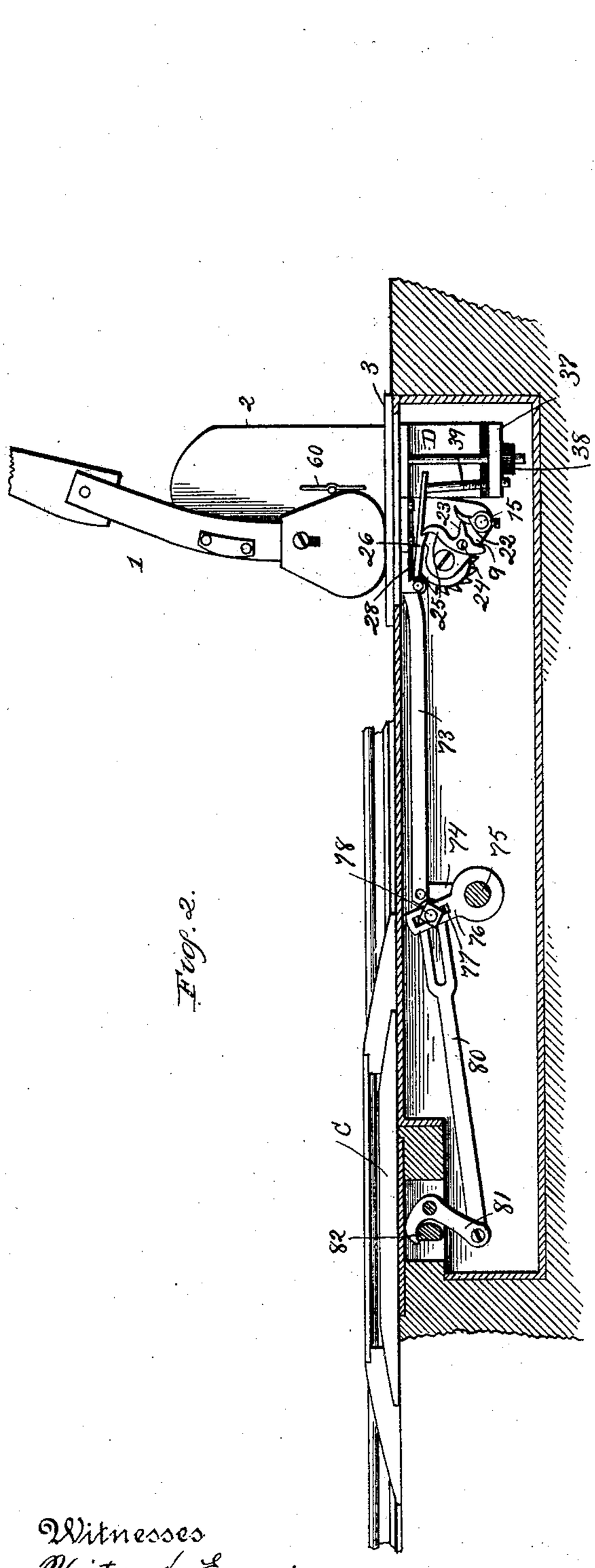

Fig. 2.

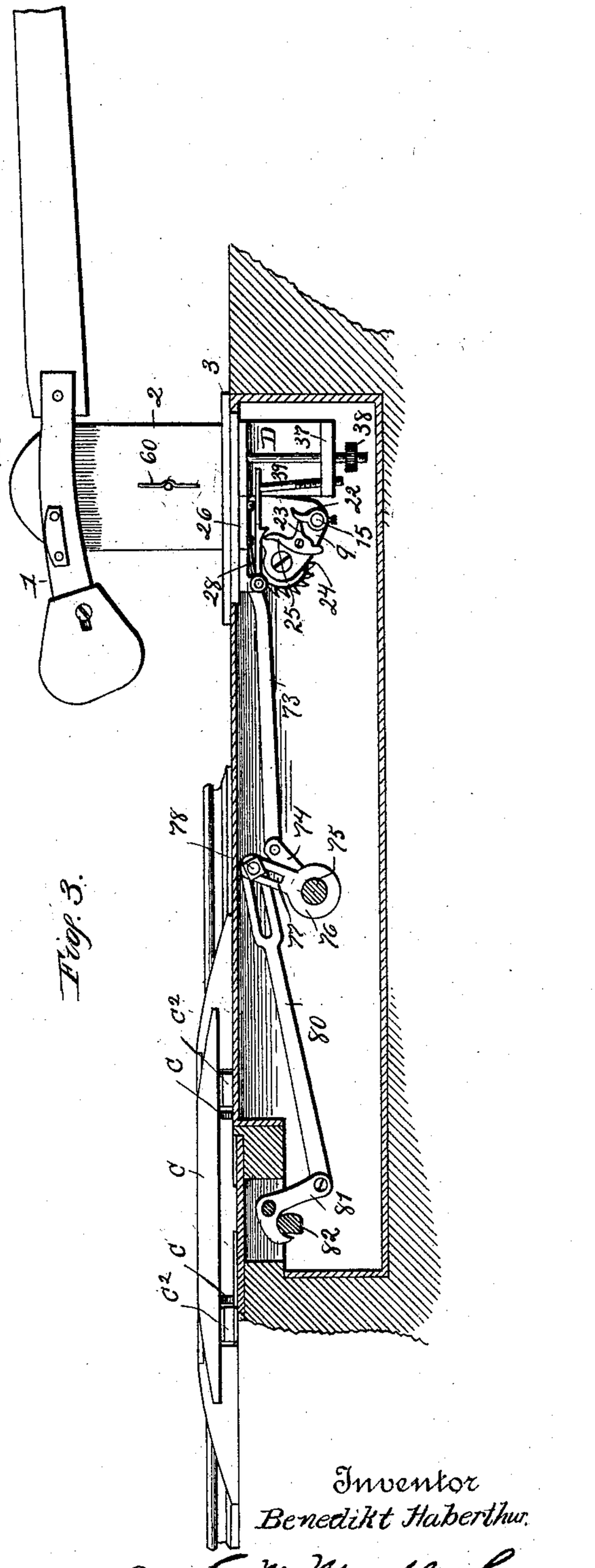

Fig. 3.

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(No Model.)

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ELECTRICALLY OPERATED RAILWAY GATE.

No. 556,183. Patented Mar. 10, 1896.

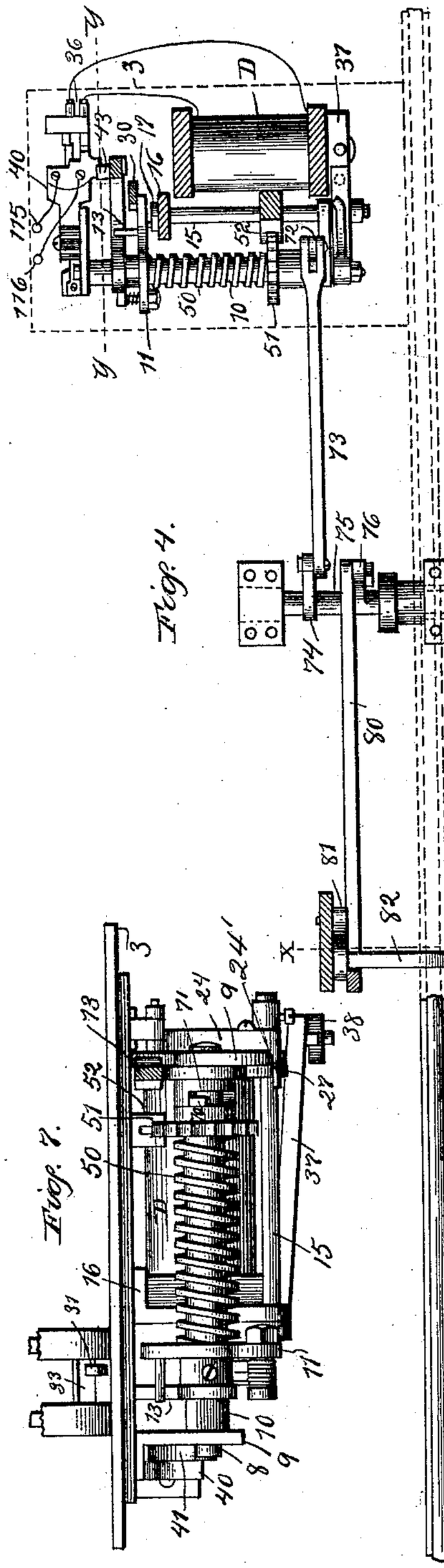

Fig. 1.

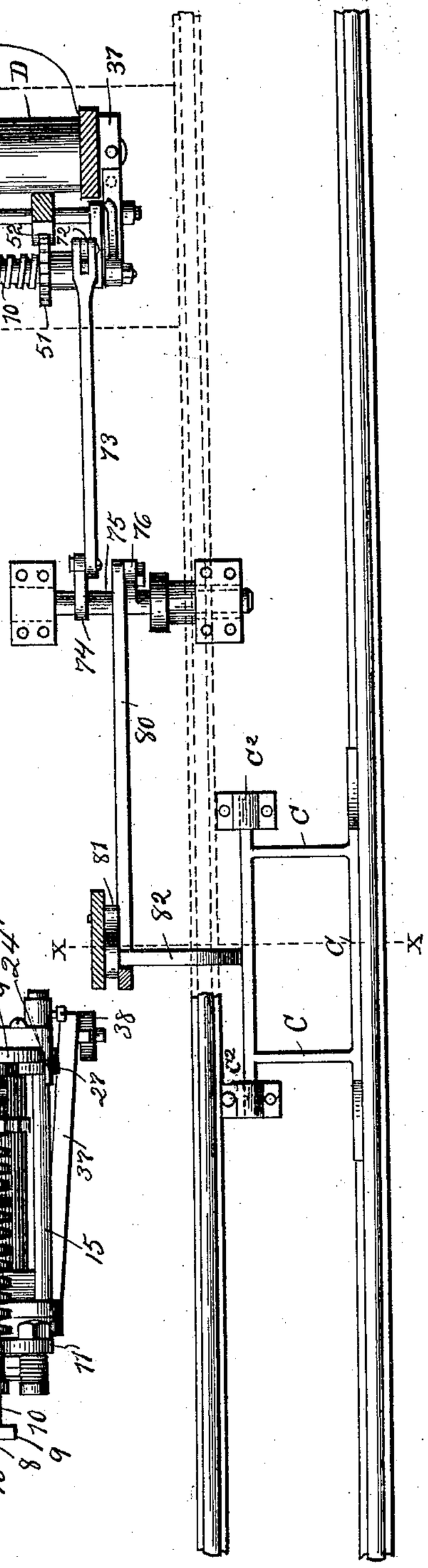

Fig. 7.

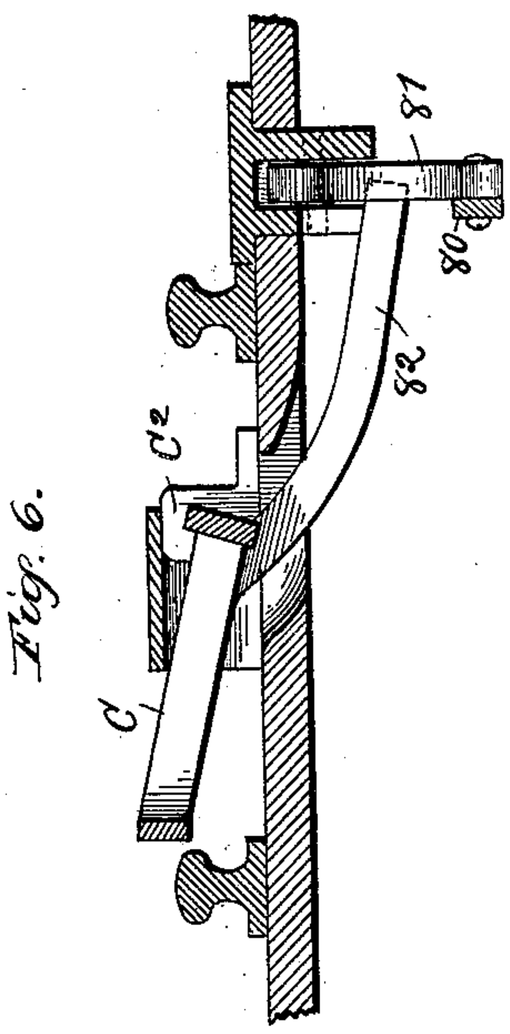

Fig. 6.

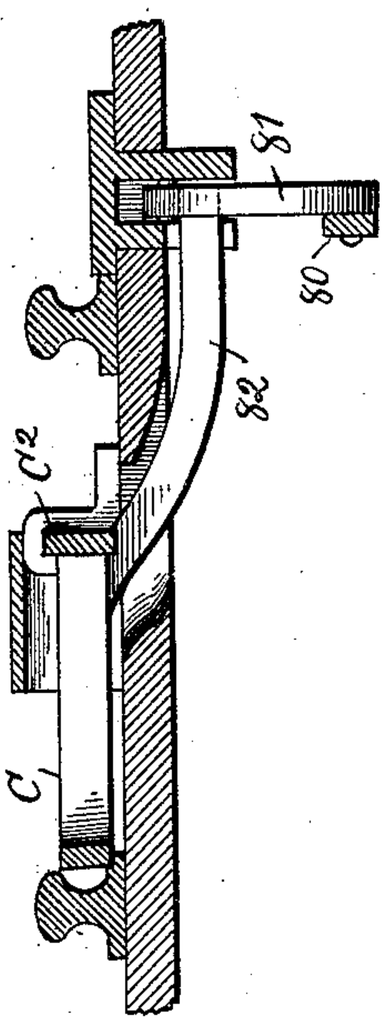

Fig. 5.

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ELECTRICALLY OPERATED RAILWAY GATE.

No. 556,183. Patented Mar. 10, 1896.

Fig. 8.

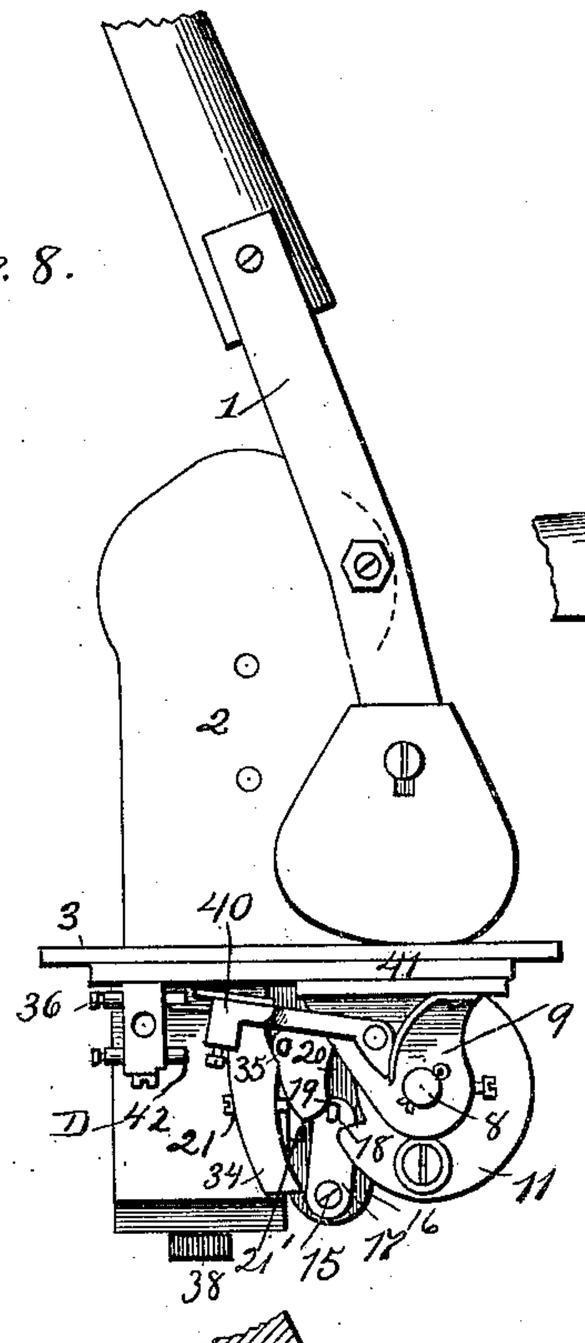


Fig. 9.

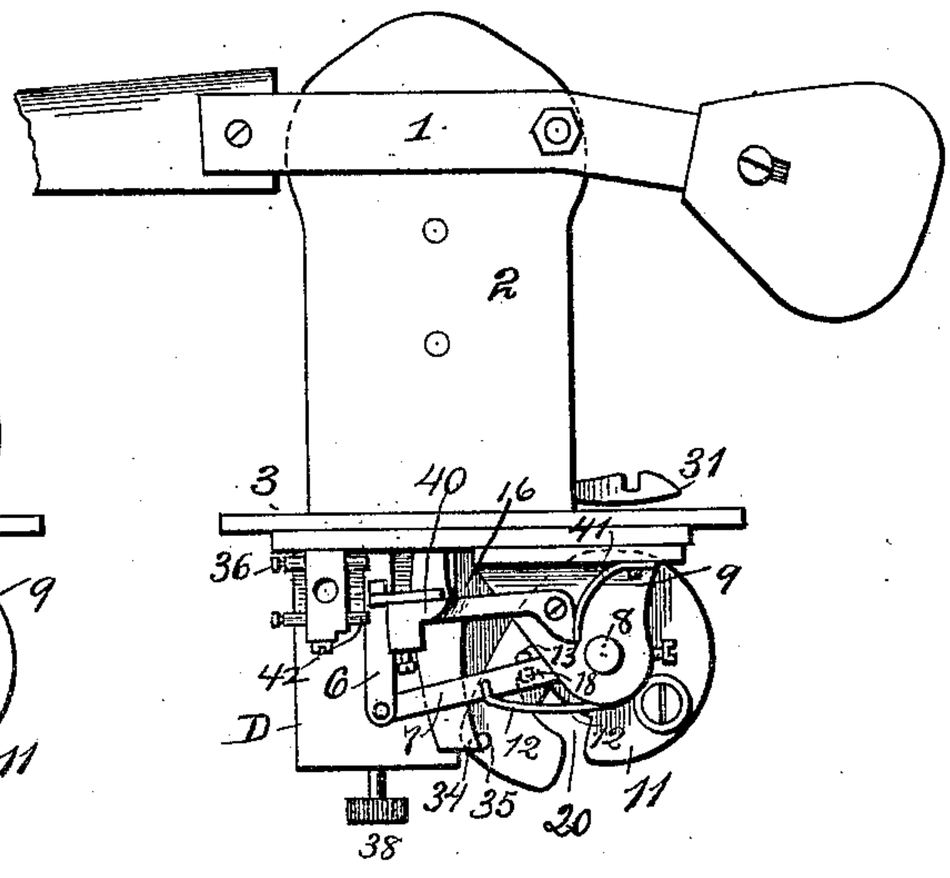


Fig. 10.

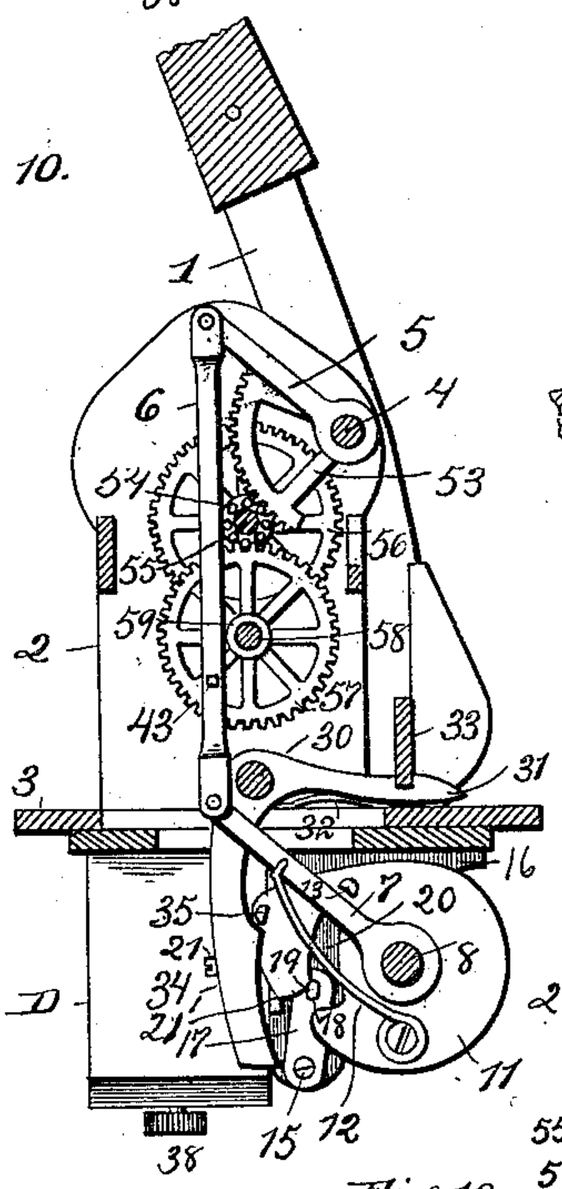


Fig. 11.

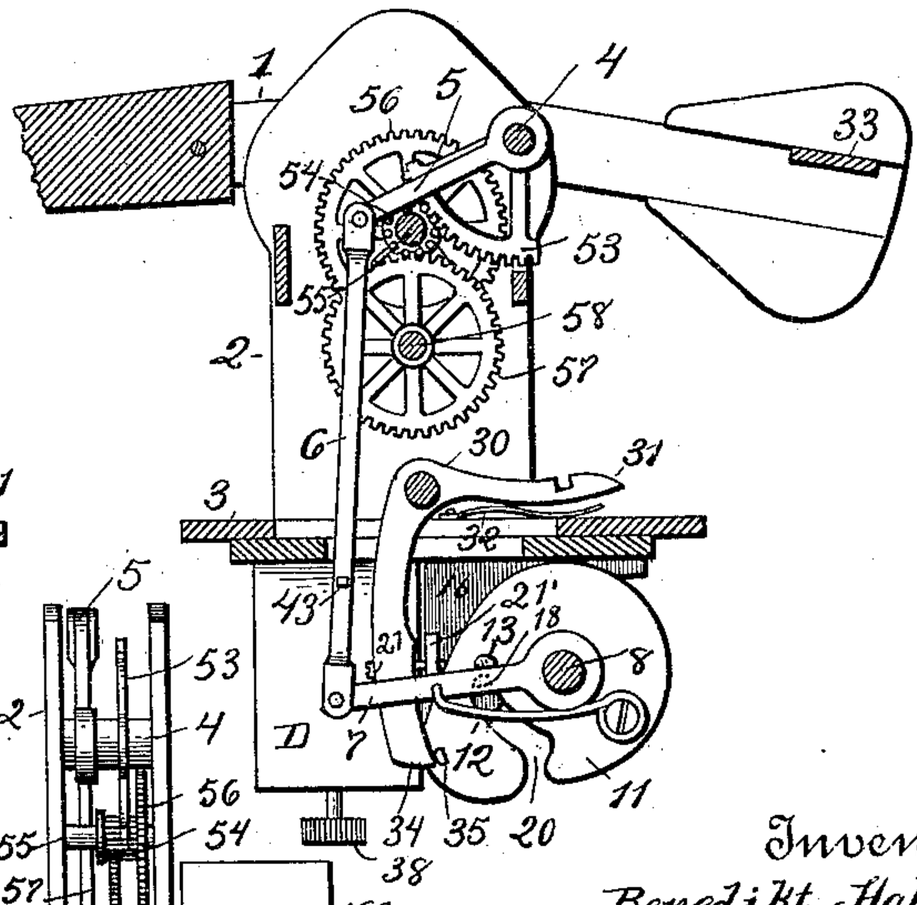
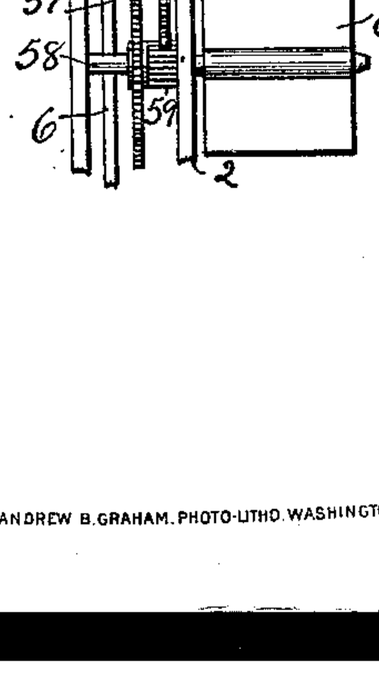


Fig. 12.



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UNITED STATES PATENT OFFICE.

BENEDIKT HABERTHUR, OF LOGANSPORT, INDIANA, ASSIGNOR OF ONE-HALF TO JOSEPH MANDEL, OF SAME PLACE.

ELECTRICALLY-OPERATED RAILWAY-GATE.

SPECIFICATION forming part of Letters Patent No. 556,183, dated March 10, 1896.

Application filed October 15, 1894. Serial No. 525,937. (No model.)

To all whom it may concern:

Be it known that I, BENEDIKT HABERTHUR, a citizen of the United States, residing at Logansport, in the county of Cass and State of Indiana, have invented certain new and useful Improvements in Electrically-Operated Railway-Gates; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in electrical railway-gates, and particularly to improvements in that class thereof which may be termed "electromechanically-operated" gates—that is, those in which the fall of the gate is brought about by the withdrawal of a detent, which normally acts to hold the gate open and is in electrical connection with a track-instrument placed some distance up the track through the actuation of said track-instrument by the passage of a train, and in which the gate is raised by mechanical means operated by the weight of the locomotive; and it consists in an improved railway-gate of this type and an improved arrangement of circuits for actuating the same, which will be hereinafter fully described, and particularly pointed out in the claims.

Electrically-operated railway-gates may be divided into two classes: first, those which rely solely upon electricity to operate the mechanism for raising and lowering the gate, and, second, those of the type to which this invention belongs, where electricity is relied upon to operate the mechanism for causing the fall of the gate, but the gate is raised by mechanical means operated through intermediate mechanism by the weight of the locomotive.

Railway-gates operated solely by electricity have usually made use of a reversible electric motor geared to the gate-beam and operated by circuits completed by an approaching train to accomplish their end. While such gates are very good in theory their cost is so great as to prevent their going into actual use, and, moveover, practical difficulties have arisen in constructing a reversible motor which will work satisfactorily without repeated inspection.

Railway-gates of the second class above mentioned have attracted considerable attention on account of the cheapness of construction possible, as a simple electric circuit with a few wet cells is all that is necessary to operate the electrical part of the signal, and it would seem at first sight to be a simple matter to provide suitable mechanism for raising the gate by the depression of track-levers operated by the weight of the locomotive and cars. Railway-gates constructed on this principle have, however, heretofore uniformly been too complex and intricate in their operative mechanism to enable them to be successfully introduced, and in spite of the advantages which this method of operating railway-gates manifestly has it is not now, so far as I am aware, in actual use.

The object of my invention is to provide an electromechanically-operated railway-gate which shall be simple in construction, easy to manufacture and put in place, not liable to get out of order, and positive and certain in its action. I also aim to operate, in connection with the railway-gate and by the same system of circuits, a danger-bell which will continuously ring while a train is upon a section or block of track extending a specified distance on either side of the gate.

I accomplish the objects of my invention by the use of a pivoted counterpoised railway-gate of the usual type connected by a system of levers to a spring-pressed revolubly-mounted collar, which is connected at one end by suitable intermediate mechanism to a track-lever which, when depressed, acts to revolve the collar in such a direction as to raise the gate. I hold the gate in its raised position by causing a stud on a crank-lever to engage with a shoulder on a cam-shaped piece integral with the revoluble collar and arrange for the proper movement of said lever by the spring-pressure of one arm of a pawl, the other arm of which, when the gate is raised, engages with a notched arm. The fall of the gate is accomplished by the completion of an electric circuit by an approaching train, and the consequent energizing of an electro-

magnet, which acts to release the detent or pawl from engagement with the notched arm, thus disengaging the stud of the crank-lever from engagement with the shoulder on the cam-shaped piece. The tension of the spring which surrounds the revoluble collar is so adjusted as to make the fall of the gate positive and certain and also to raise the track-lever above the track, so that it will be struck and depressed by the wheels of the approaching train. A wind-vane or other regulating means is provided to moderate and control the fall of the beam, and the current through the electromagnet which acts in connection with the beam is so arranged as to be broken when the beam falls and only restored when the beam is raised again, thus preventing waste of current.

The arrangement of circuits for actuating the railway-gate and bell-signal which I use in connection therewith is as follows: For a considerable distance on either side of the crossing at which the gate is located the rails are bonded together so as to form continuous conductors. The electromagnet which forms a part of the gate-operating mechanism is connected to a track-instrument which is placed some distance in advance of the gate and also through a normally open relay, which is placed some distance on the other side of the gate, to a battery, the other pole of which is connected to the rail beside which the before-mentioned track-instrument is situated. The circuit is such that as soon as the relay is closed the actuation of the track-instrument will energize the electromagnet and allow the gate to fall. Either on the same or on the opposite side of the road as the gate is situated a bell, of any convenient and preferred type, which is connected through the normally open relay and battery to the rail beside which the track-instrument is situated and also to the other track-rail, the connection here being such that when the relay is closed the wheels of a locomotive, completing the circuit between the two rails, will complete the bell-circuit and cause the bell to ring as long as the locomotive remains on the track-section or block or until it passes a second track-instrument, which acts to open the now closed relay and break the bell-circuit. The relay is operated by a track-instrument in advance of that which operates the gate, so that an approaching train first operates this track-instrument, closes the circuit through the normally open relay, and thus put the bell and gate circuits in condition for operation, then as it advances onto the block rings the bell, operates the track-instrument which is in connection with the gate and allows the gate to fall, and, finally, as it passes the track-levers depresses the same and raises the gate, at the same time actuating the track-instrument which opens the relay-circuit, thus stopping the bell. The gate and bell are thus perfectly controlled and are caused to perform their functions with certainty. Only one line-wire need be used, and this can be suspended on the telegraph-poles beside the track.

My invention is fully represented in the drawings accompanying and forming a part of this application, in which the same reference letters and numerals refer to the same or corresponding parts, and in which—

Figure 1 is a view illustrating the relative positions of the gate, bell, and track-lever, showing also the circuits which operate the same. Fig. 2 is a side view of the gate, track-lever, and the connecting-rods which connect the same, the parts being shown in the position they assume when the gate is up. Fig. 3 is a similar view, the parts being shown in the position they assume when the gate is down. Fig. 4 is a partial top plan view of the gate and operative mechanism therefor, the gate itself and its base-plate not being shown in order that the relative position of the parts directly under the gate may be illustrated. Fig. 5 is a section of Fig. 4, taken on the line $x\,x$, illustrating the track-lever and showing it depressed. Fig. 6 is a corresponding view, the track-lever being shown raised. Fig. 7 is a side view of the gate-operating mechanism. Fig. 8 is a view of the gate, taken from the side opposite to that shown in Fig. 2, the parts being shown in the position they assume when the gate is up. Fig. 9 is a similar view, the parts being shown in the position they assume when the gate is down. Fig. 10 is a section taken on the line $y\,y$, Fig. 4, showing particularly the lever system which connects the gate with the revoluble collar and the system of gear-wheels which operate the wind-vane, the parts being shown in the position they assume when the gate is up. Fig. 11 is a similar view, the gate being shown down. Fig. 12 is an end view of the mechanism which operates the wind-vane, showing the said vane in position. Figs. 13 and 14 represent different forms of track-instruments which I may use. Fig. 15 is a bottom perspective view of the normally-open relay, which is used in connection with the circuits operating the gate.

Referring now to the drawings and first particularly to Fig. 1, A represents the railway-gate; B, the bell-signal, which may be placed either on the same or on the opposite side of the track as the gate, and C the track-lever, which when depressed raises the gate.

I, II, and III represent the different track-instruments used to operate the different circuits, I being track-instrument which when actuated closes the circuit through the normally-open relay which is placed beside the track-lever C and places the gate and bell circuits in condition for operation, II the track-instrument which when actuated completes the circuit through the electromagnet which controls the gate and allows the gate to fall, and III the track-instrument which when actuated breaks the gate and bell circuits.

1 represents the gate-beam. It is of the

ordinary counterpoise type and is pivoted upon the standards 2, which inclose the gearing necessary to operate the speed-regulating device used in connection with the gate and rest upon the base-plate 3. To the shaft 4, which forms the pivot for the gate, is keyed the lever 5, to the free end of which is pivotally connected the rod 6, whose end is connected with the lever 7, which is loosely mounted upon the shaft 8. This shaft is supported underneath and lengthwise of the base-plate 3 by the brackets 9, and upon it is loosely mounted the revoluble collar 10, (see Fig. 4,) which extends nearly the whole length of the said shaft and is connected at one end through suitable intermediate mechanism to the track-lever C. On its other end is integrally formed the cam-shaped piece 11. To this cam-shaped piece is screwed the spring 12, the free end of which bears against the lower side of lever 7. Upon cam-shaped piece 11 is also formed the pin or stud 13, which bears against the top of said lever. The connection between the gate and the revoluble collar 10 is such that the gate will be raised or lowered according to the direction of its rotation.

The mechanism for holding the gate in its upright position is as follows: Lengthwise of the base-plate 3 and paralled to the shaft 8 is journaled the shaft 15, one bearing for which is provided in the bracket 9, (see Fig. 2,) and the other bearing for which is provided by the projecting lug 16. (Seen in section in Fig. 4.) On one end of this shaft, as seen in Figs. 8 to 11, is keyed the lever-arm 17, on the upper end of which is formed the lug 18, which, when the gate is up, as shown in Figs. 8 and 10, engages with the shoulder 19 formed on the cam-shaped piece 11, and which when the gate is down, as shown in Figs. 9 and 11, passes up into the slot 20 formed in said cam-shaped piece. When the lug 18 bears against the shoulder 19, the gate is held raised, but when the shaft 15 is turned slightly the said lug may pass up into the slot 20, and the gate is allowed to fall. A set-screw 21, which passes through the projection 21′ formed on the lug 16, adjusts the movement of the crank-arm 17. The means whereby the movement of the shaft 15 and the crank-arm 17 is effected is shown in Figs. 2 and 3, which are side views of the side of the gate opposite to that shown in Figs. 8 to 11. As there shown, to the shaft 15 is keyed the bent lever 22, against which presses the short arm 23 of the detent or pawl 24, the long arm 25 of which engages, when the gate is raised, with the notched arm 26. The pressure of the spring 27 (see Fig. 7) against the rearwardly-extending pin 24′ of the pawl 24 is such as to cause the short arm 23 of said pawl to press continually against the bent lever 22, and the pressure of the spring 28 against the notched arm 26 is such as to force said arm down into engagement with the long arm 25 of said pawl. When the gate is raised, as the lug 19 (see Fig. 8) is thereby released from the slot 20 the arm 23 is permitted to press against and turn the bent lever 22 sufficiently far to allow the arm 25 of the pawl 24 to engage with the notched arm 26. This throws stud 18 (see Fig. 8) against shoulder 19 and holds the gate in its upright position. The gate is securely locked in this position until the release of the pawl or detent from the notched arm.

As a further and additional means for holding the gate in its locked position, in the standards 2 is pivoted the bell-crank lever 30, (see Figs. 8 to 11,) one arm of which, 31, is notched so as to be forced upward by the spring 32 into engagement with the cross-piece 33 of the counterpoise of the gate-beam when the gate is raised, and the other arm of which, 34, hangs down so as to be struck by the lug 35 on the cam-shaped piece 11 whenever said cam-shaped piece is moved. The counterpoise of the beam 1 is so connected thereto as to be allowed a slight pivotal movement. When the beam is raised the lug 35 strikes the arm 34 of the bell-crank lever 30, and the notch or groove in the arm 31 of said lever engages with the cross-piece 33 of the counterpoise and is held in such position by the spring 32. When the gate is allowed to fall the lug 35 strikes the curved inner side of the arm 34 and releases the arm 31 from engagement with the counterpoise.

It has been stated that as long as the arm 25 of the pivoted pawl shown in Fig. 2 remains in engagement with the notched arm 26 the gate will be held in its raised position. The disengagement of the pawl from the notched arm is accomplished as follows: To the under side of the base-plate 3 is secured the electromagnet D, of the type more clearly shown in Fig. 15, which receives its current from the contact-points 36, and the armature 37 of which is limited in its downward movement by the thumb-nut 38. Through this armature passes the arm 39, which when the magnet is not energized rests against the notched arm 26, as shown in Fig. 2. When, however, the magnet is energized and the armature attracted said arm raises the notched arm 26 and releases the pawl from engagement therewith, thereby allowing the gate to fall.

To prevent any possible waste of current, it is arranged that when the beam has fallen the circuit through the electromagnet D shall be broken. This is accomplished as follows, reference being had to Figs. 8 to 11: The contact-points 36, from which the wires pass to the electromagnet D, are placed in connection with the outside circuit by the contact-arm 40, which is pivotally mounted on the bracket 9, is pressed upward by the spring 41, and is provided with stops to limit its downward movement by the arms 42. As shown in Fig. 4, the shape of this arm 40 is such that it will be struck and moved by the lug 43 on lever 6. When the gate-beam is up, the spring 41 will force the contact-arm 40 into engagement with the contact-points

36. When, however, the beam descends, the lug 43 will strike against said arm and force the same to its lower position, thereby breaking the circuit through the electromagnet D. The circuit is not restored until the beam is raised. Any waste of current which might be present here is thus effectually prevented.

The long arm of the gate is slightly heavier than the counterpoise of the gate, and so the gate would naturally tend to fall by itself when the detent 25 is removed from engagement with the notched arm 26. (See Fig. 2.) To render the fall of the gate certain, however, and to overcome the friction of the levers connecting the revoluble collar 10 to the track-lever C, the spring 50 is provided, which encircles said collar, is connected at one end to the cam-shaped piece 11, formed integral with the same, and at the other end with the ratchet 51, which may be turned until the desired tension on the spring is obtained, and then held in position by the pawl 52. The tension of this spring can thus be adjusted to any desired degree. As this tension has to be amply sufficient to overcome the friction of the levers connecting the collar 10 with the track-lever, it has been deemed best to apply some means to regulate the fall of the gate-beam, and the regulating means which I now use is shown in Figs. 10, 11 and 12. To the shaft 4, which forms the pivot of the gate-beam 1, is keyed the quadrant 53, which engages with the small gear-wheel 54, mounted on the shaft 55. On this same shaft is mounted the gear-wheel 56, and gear-wheels 54 and 56 engage, respectively, with gear-wheels 57 and 59, mounted on shaft 58, which extends outward from the standard 2 and bears on its outer end the wind-vane 60. As the gate falls this wind-vane is rotated and acts to regulate the fall of the beam.

It has been stated that the upward movement of the gate is caused through intermediate mechanism by the depression of the track-lever C, and consequent rotation of the revoluble collar 10. The connection between the two parts is as follows: Revolubly mounted on collar 10, but held in position thereon by the lug 70, (see Fig. 7,) formed on said collar, engaging with the side slot 71 formed therein, is the lever 72, to which is attached the lever 73. At its other end this lever is connected to the crank 74, which is keyed to the shaft 75, to which shaft is also keyed the crank 76. In this crank is formed a slot 77, and the bolt 78 passing through said slot and the slot formed in one end of the lever 80 connects the two. This lever 80 is pivoted at its other end to one arm of the bell-crank lever 81, against the short arm of which bears the extension 82 of the track-lever C. The track-lever is pivoted in suitable bearings C^2, and is in such connection with the gate-beam that when the gate-beam is down the parts are in the position shown in Fig. 3, with the track-lever raised above the track. When the track-lever is depressed, however, its arm 82 presses upward the short arm of the bell-crank lever 81, thereby moving the parts in the position shown in Fig. 2 and causing the gate to rise. The arrangement of the track-levers is such that it requires only a relatively small movement of the track-lever C to rotate collar 10 and raise the gate. The weight of the train will be sufficient to accomplish this. There will be but little wear in the bearings, and the bearings and levers can be easily replaced. If desired, they can be inclosed in a box in the manner shown in Figs. 2 and 3. The length of the arms 76 and 80 determines the distance of the track-lever from the railway-gate.

It has thus been seen that the gate is lowered by the actuation of a track-instrument by the passage of a train, thus energizing the electromagnet which operates directly in connection with the gate-operating mechanism, and that the gate is raised by the operation of track-levers, which are depressed by the weight of the locomotive. There remains to be considered the circuits which operate the gate and bell-signal. Previous to explaining the operation of these circuits, however, attention is first called to the track-instruments and relays shown in Figs. 13, 14 and 15.

In Fig. 13 I have illustrated the form of track-instrument which I use at I, in Fig. 14 the form of track-instrument which I use at II, and in Fig. 15 the form of relay which I use in connection with the track-instrument at III. It is not necessary that I use different forms of track-instruments; but I have illustrated and will describe the same. In Fig. 13 the track-instrument consists of the pivoted arm 90, whose pointed end projects slightly above the rail, and to which is pivoted the spring-pressed arm 91. When the track-instrument is actuated by the wheels of the train, the arm 91 is forced against the pin 92 which is in contact with the rail. As the arm 91 is connected by a suitable wire to one pole of the battery and as the rail is connected with the other pole of the battery, the circuit is completed by the actuation of this track-instrument.

In Fig. 14 the track-instrument is provided, as before, with a pivoted arm 90, supported and held in its proper place by the support 90′, which is shown in section. In this case the pivoted arm 90 bears against lever 93, which is pivoted in an extension formed on the pivoted lever 95, but is pressed apart from said lever by a suitable spring, as shown. The lever 95 is journaled on the supporting-arm 94, and thus is held in proper relation to the track-instrument. When the track-instrument is actuated by the wheels of the train, it presses against the arm 93, and this communicates the pressure to the arm 95, pressing the latter against the pin 96, which is in contact with the rail.

The electromagnet 100 (shown in Fig. 15) is of a common type, having a pivoted armature 101, which when the magnet is energized

makes contact with the pole-piece 102. On one side of the relay is a pivoted lever 103, which bears on its outer end the contact-piece 104, which when the lever is down completes the circuit between the strips 105 and 106. Normally the lever is held raised by the spring-pressed bell-crank lever 107. When, however, the magnet is energized, the pin 108, which is fastened to the armature of the magnet, withdraws the bell-crank lever from engagement with the pivoted arm and allows said arm to fall, being guided by the slotted piece 109 until its contact-point 104 completes the circuit through the strips 105 and 106. The pivoted lever 110 is the lower portion of track-instrument III. When the circuit is closed through strips 105 and 106, the pivoted lever 103 rests in the hollow in the bottom of the track-instrument. When, however, the track-instrument is actuated by the wheels of a train, it lifts the lever and restores the bell-crank lever 107 into engagement with the same, thereby holding it in its raised position.

Having now described the various mechanism which I use in connection with the railway gate and signal, it remains to consider the operation of the circuits which control the same. The railway-gate is connected by wire 115 to track-instrument II. It is also connected by wire 116 to contact-strip 105. Contact-strip 106 is connected by wires 117 and 118 to one pole of the battery, the other pole of which is connected by wire 123 to the rail beside which the track-instrument II is situated. The bell B may be on the same or the opposite side of the track as the gate, or in any desired relation thereto, but in either case is connected by wires 119 and 116 to contact-strip 105 and by wire 120 to the other track-rail opposite to that beside which the track-instrument is situated. The circuits are thus such that when the relay 100 is closed, the bell-circuit will be made complete by a train passing over the rails, and the gate-circuit, by the actuation of track-instrument II. Just outside of the block in which the gate and bell are located is placed the track-instrument I, which is connected by wire 121 to the line-wire X, and thence by wires 122 and 118 through the coil of the electromagnet 100 to the battery and the track-rail beside which the track-instrument is situated. An approaching train first actuates track-instrument I, thereby closing the relay and making the gate and bell circuits ready for operation. As the train advances upon the block the bell-circuit is complete and the bell commences to ring and rings continuously until track-instrument III is passed. When the train passes track-instrument II it lowers the gate, and the gate remains lowered until the wheels of the locomotive depress track-lever C, at the same time actuating track-instrument III and thereby breaking the bell-circuit. The operation throughout is simple but positive. Only one line-wire is necessary, and that may be carried on the telegraph-poles which always border a railway-track. A circuit-breaker 130 (shown in detail in Fig. 16) may be placed in the circuit through track-instrument I. When the contact-piece 131 is turned so as to break the circuit through contact-points 132 and 133, the circuit-breaker will prevent the gate from being actuated by a train. This is sometimes desirable in handling freight-trains and in switching cars.

What I claim as new, and desire to secure by Letters Patent, is—

1. In electrically-operated railway-gates, the combination with a pivoted gate-beam normally held in a raised position, of a revoluble arm or collar, mounted on a shaft distinct from that on which the gate-beam is mounted, a lever system connecting said arm or collar to said pivoted beam, whereby the beam will be raised or lowered by its rotation, a detent for normally holding the beam in its raised position, a track-instrument placed some distance up the track in such connection with the detent as when actuated by the passage of a train to withdraw the detent and allow the gate to fall, and a track-lever in such connection with the revoluble arm or collar as to rotate said arm or collar and raise the beam when depressed by the passage of the train, substantially as described.

2. In an electrically-operated railway-gate, the combination with a pivoted gate-beam normally held in a raised position, of mechanical means for enabling the gate to be raised or lowered, a detent controlled by an electromagnet for normally holding the beam in upright position, a track-instrument for energizing said electromagnet and withdrawing the detent, a track-lever for raising the gate when depressed by the passage of a train, and a contact-arm normally completing the circuit through the electromagnet, for breaking said circuit when the gate falls, and only restoring it when the gate is raised, substantially as described.

3. In electrically-operated railway-gates, the combination with a pivoted beam normally held in a raised position, of a spring-controlled revoluble arm or collar, mounted on a shaft distinct from that on which the gate-beam is mounted, a lever system connecting said arm or collar to said pivoted beam, whereby the beam will be raised or lowered by its rotation, a detent for normally holding the beam in its raised position, a track-instrument placed some distance up the track in such connection with the detent as when actuated by the passage of a train to withdraw the detent and allow the gate to fall, and a track-lever in such connection with the revoluble arm or collar as to rotate said arm or collar and raise the beam when depressed by the passage of the train, substantially as described.

4. In an electrically-operated railway-gate, the combination with a pivoted beam normally held in a raised position, of a revoluble

arm or collar connected with the beam in such a manner as to raise or lower the same by its rotation, a cam integral with said revoluble arm or collar having a slot cut therein with a shouldered end, a pin controlled by a detent working in said slot and when engaging the shouldered end of the same holding the beam in its raised position, a controlling-detent, an electromagnet operated by a track-instrument placed some distance up the track for releasing the detent and allowing the gate to fall when said track-instrument is actuated by the passage of the train, and a track-lever in such connection with the revoluble arm or collar as to rotate said arm or collar and raise the gate when depressed by the passage of a train, substantially as described.

5. In an electrically-operated railway-gate, the combination with a gate-beam normally held in a raised position, of a spring-pressed arm engaging with the end of the beam and locking the gate in its raised position, electrically-controlled means for withdrawing the spring-pressed arm so as to permit the fall of the gate, and a track-instrument, mechanically connected with the gate-operating mechanism for raising the gate when depressed by the passage of a train, substantially as described.

6. In an electrically-operated railway-gate, the combination with a pivoted beam normally held in a raised position, of a revoluble arm or collar connected with the beam in such a manner as to raise or lower the same by its rotation, a detent for normally holding the beam in its raised position, a spring-pressed arm for engaging with the end of the beam and aiding to hold the same in a raised position, a track-instrument placed some distance up the track in such connection with the detent as when actuated by the passage of a train to withdraw the detent and allow the gate to fall, means operated by the fall of the gate for releasing the spring-pressed arm, and a track-instrument in such connection with the revoluble arm or collar as to rotate said arm or collar and raise the gate when depressed by the passage of a train, substantially as described.

7. In an electrically-operated railway-gate, the combination with a pivoted beam normally held in a raised position, of a revoluble arm or collar connected with the beam in such a manner as to raise or lower the same by its rotation, a detent controlled by an electromagnet for normally holding the beam in its raised position, a track-instrument placed some distance up the track in such connection with the electromagnet as when actuated by the passage of a train to cause the same to withdraw the detent and allow the gate to fall, a track-instrument in such connection with the revoluble arm or collar as to rotate said arm or collar and raise said beam when depressed by the passage of a train, and a spring-pressed contact-arm normally completing the circuit through the electromagnet but forced downward so as to break the circuit by the fall of the gate, substantially as described.

8. In an electrically-operated railway-gate, the combination with a pivoted beam normally held in a raised position, of a revoluble arm or collar, a lever system connecting said arm or collar to said pivoted beam, whereby the beam will be raised or lowered by its rotation, a detent controlled by an electromagnet for normally holding the beam in its raised position, a track-instrument in such connection with the electromagnet as when actuated by the passage of a train to cause the same to withdraw the detent and allow the gate to fall, a track-instrument in such connection with the revoluble arm or collar as to rotate said arm or collar and raise said beam when depressed by the passage of a train, a spring-pressed arm normally completing the circuit through the electromagnet, and a lug on one of the levers connecting the revoluble arm or collar and gate-beam for forcing the pivoted arm downward so as to break the circuit by the fall of the gate, and only allow said pivoted arm to rise and complete the circuit when the gate is raised, substantially as described.

9. In an electrically-operated railway-gate, the combination with a pivoted beam 1, of a spring-controlled revoluble collar 10, a slotted disk 11, a lever system operated by said disk and connecting the disk and pivoted beam, a lever connection between the collar 10 and the track-instrument, which, when depressed will revolve the collar in such a direction as to cause it to raise the gate, a shaft 15 bearing on one end an arm 17 which works in the slot of the disk 11, and on the other end the pin 22, a pawl 24, a notched lever 26, an electromagnet D, an armature 37, and means on said armature for raising the notched arm when the magnet is energized, substantially as described.

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

BENEDIKT HABERTHUR.

Witnesses:
HUGH SHANAHAN,
SOL. WISE.