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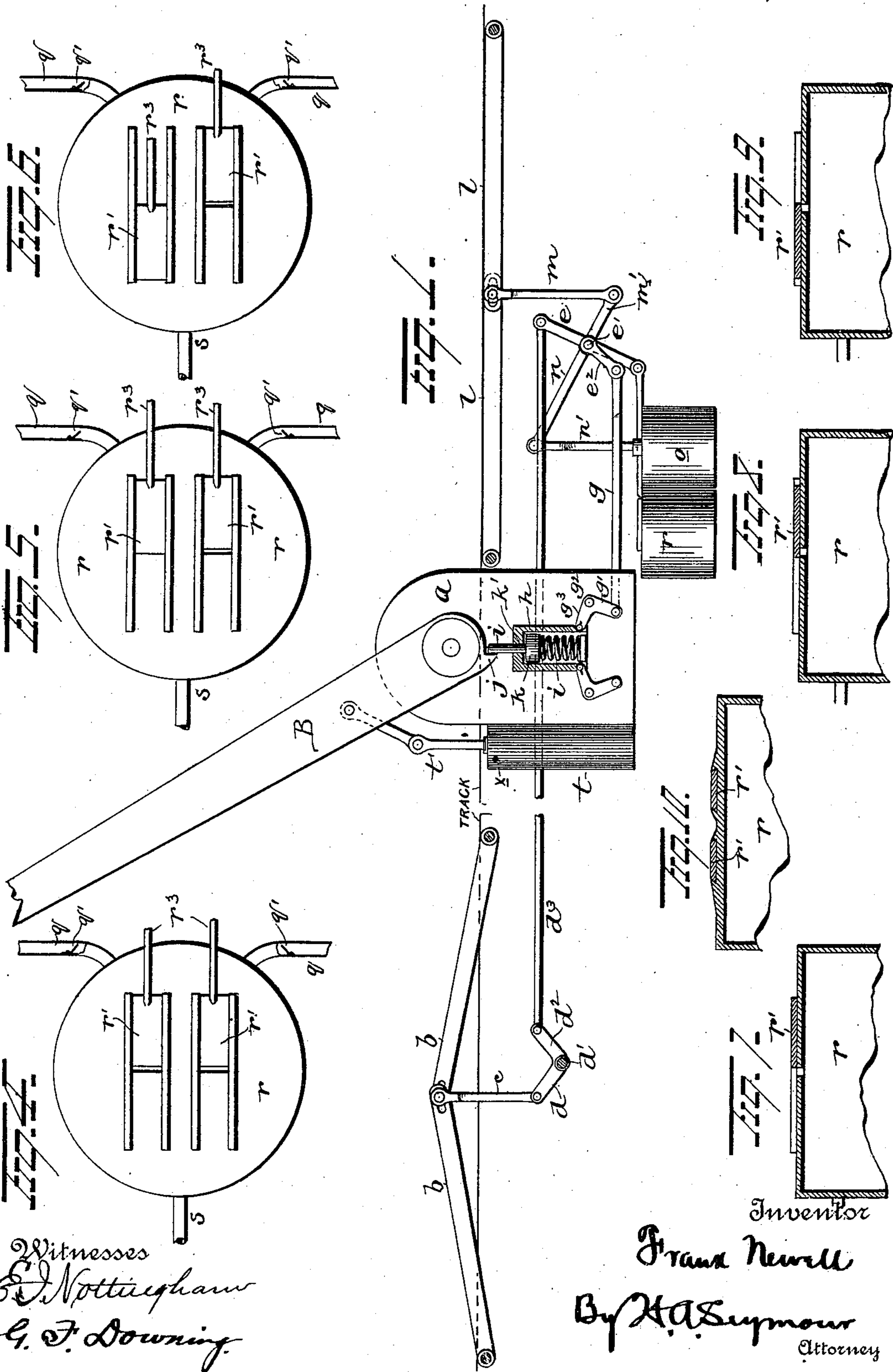
3 Sheets—Sheet 1.

F. NEWELL.

MEANS FOR OPERATING RAILROAD GATES.

No. 576,789.

Patented Feb. 9, 1897.



Witnesses
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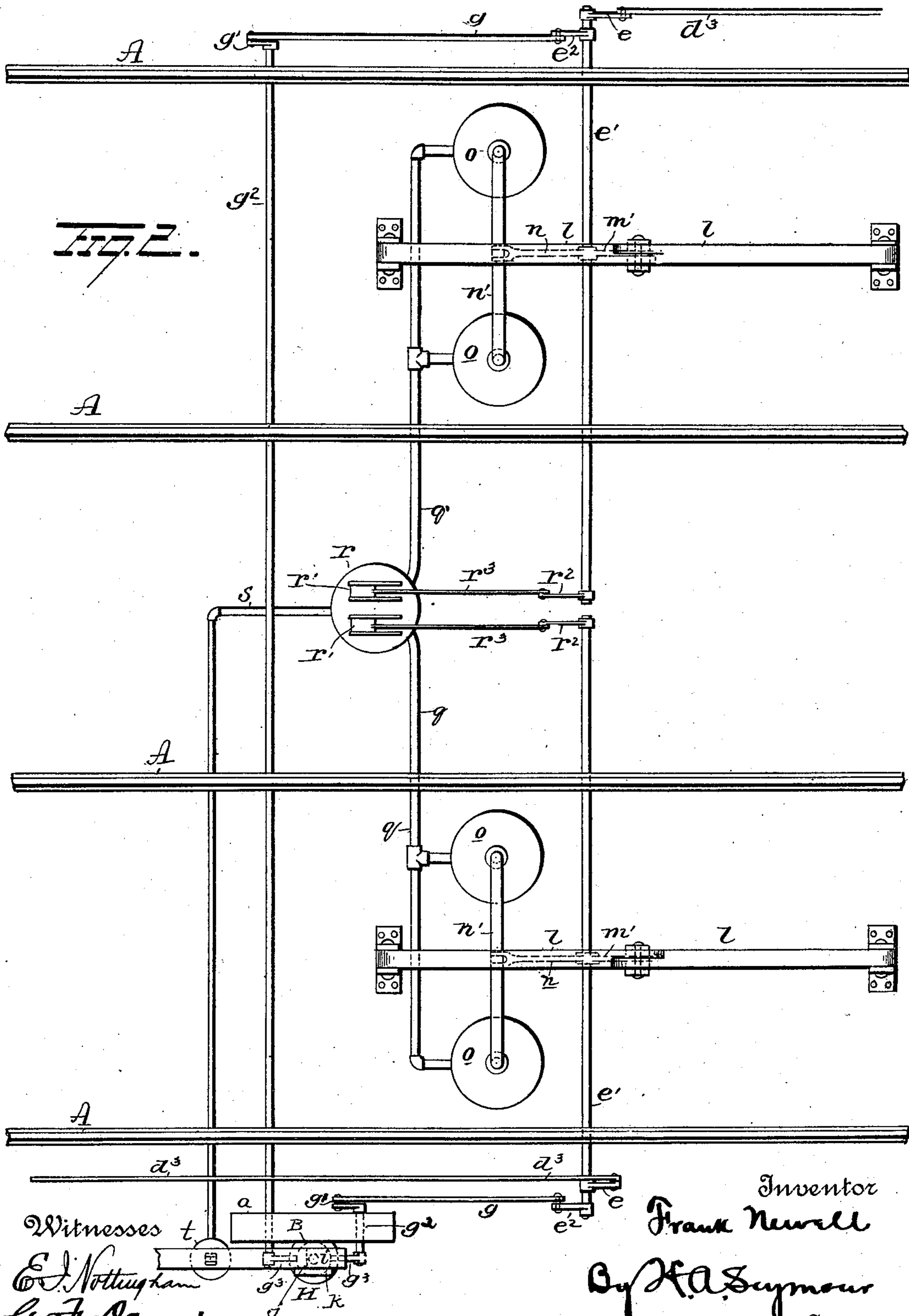
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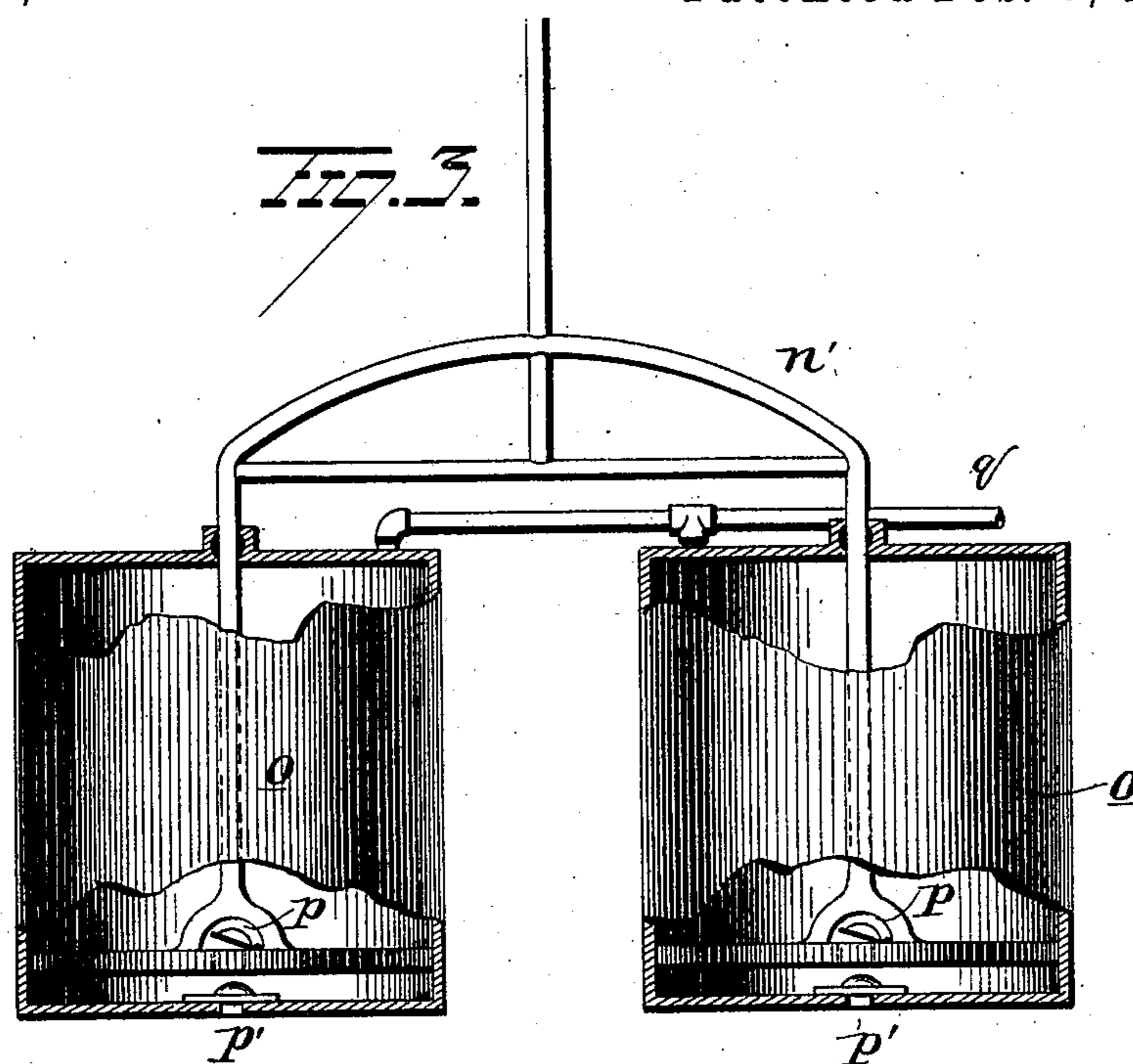
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3 Sheets—Sheet 3.

F. NEWELL.
MEANS FOR OPERATING RAILROAD GATES.

No. 576,789.

Patented Feb. 9, 1897.



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UNITED STATES PATENT OFFICE.

FRANK NEWELL, OF NEW YORK, N. Y.

MEANS FOR OPERATING RAILROAD-GATES.

SPECIFICATION forming part of Letters Patent No. 576,789, dated February 9, 1897.

Application filed October 3, 1894. Serial No. 524,829. (No model.)

To all whom it may concern:

Be it known that I, FRANK NEWELL, a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Means for Operating Railroad-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 an improvement in railroad-gates, and more particularly to means for operating the same, the object of the invention being to produce simple and efficient means whereby automatically to control the operation of gates at railroad-crossings by the passage of the train.

A further object is to construct devices for automatically operating a railroad-gate in such manner that upon the approach of a train to the crossing the gate will be lowered and so that when the train passes the crossing the gate will be raised and the lowering devices automatically set to be actuated by the following train.

A further object is to produce means for automatically operating a railroad-gate which shall be durable, sure in operation, not easy to get out of order, and which shall be effectual in all respects in the performance of their functions.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side view illustrating my improvements. Fig. 2 is a plan view. Figs. 3, 4, 5, 6, 7, 8, and 9 are detail views.

A A represent the rails of a railroad-track at a road-crossing, and B a gate for guarding the crossing during the passage of a train. The gate B is pivotally supported near one end in suitable standards *a*. A suitable distance from the crossing levers *b b* are located, said levers being connected together, and the outer end of each lever being pivotally connected to suitable brackets secured to the railroad-ties. Where the levers *b b* are connected together, one end of a vertical rod *c* is connected, the other end of said rod being

pivoted to the free end of a crank-arm *d*, which projects from a shaft *d'*, disposed transversely under the rails of the track. The shaft *d'* is also provided with a crank-arm *d*², to the free end of which one end of a long rod *d*³ is pivoted, said rod being of a length sufficient to extend to a point near the crossing, where it is pivoted to the free end of a crank-arm *e*, projecting from a shaft *e'*, disposed horizontally under the rails. The shaft *e'* is also provided with a crank-arm *e*², pivoted at its free end to one end of a rod *g*, the other end of said rod being pivotally connected to an arm *g'*, carried by a shaft *g*². An arm *g*³ is secured to said shaft *g*² and pivoted to a sleeve *h*. A dog or catch *i* passes through the sleeve *h* and is normally maintained at the upper end of its throw by means of a spring *i'*, said dog or catch being adapted to engage with a lug *j*, projecting from the pivoted end of the gate B, and thus maintain said gate in its normally-raised position. The dog or catch *i* is made with an enlargement *k*, adapted to operate within the sleeve *h* and limit the upward movement of said dog or catch by engaging a flange or shoulder *k'* at the upper end of the sleeve *h*.

From the construction and arrangement of parts above described it will be seen that when the levers *b b* are depressed (which depression will be accomplished by a wheel carried by the bogie-truck of the locomotive) the sleeve *h* will be pulled down through the medium of the connections above described, thus moving the dog or catch *i* out of line with the lug *j* on the gate, whereupon the gate will be lowered by its own gravity.

In proximity to the crossing two levers *l l*, constructed and arranged the same as the levers *b b*, are located between the track-rails. A depending rod *m* is connected with the levers *l l* where the latter are pivoted together, and the other end of this rod is pivoted to the free end of the crank-arm *m'*, carried by the shaft *e'*. When the levers *b b* are depressed to release the gate, as above explained, the turning or oscillation of the shaft *e'* will cause the free end of the crank-arm *m'* to rise, thus pushing up the rod *m* and elevating the inner ends of the levers *l* into position to be operated by the wheel on the locomotive. When the wheel on the locomotive strikes these le-

vers *l*, they will be depressed, thus causing the shaft *e'* to oscillate in the reverse direction, which motion will be transmitted, through the connections above described, to the levers *b b* and reset the latter to be operated upon by the next train.

The shaft *e'* carries a comparatively long crank-arm *n*, which is connected at its free end with a yoke *n'*, the parallel members of said yoke constituting rods for plungers which operate in pump-cylinders *o o*, and the pumps are provided with valves *p p'*. The cylinders or pumps *o* communicate by means of pipes *q* (having check-valves *q'*) with a reservoir *r*, which latter is provided with a slide-valve *r'*, operated by means of a crank-arm *r²*, carried by the shaft *e'*, and a rod *r³*. This valve is closed when the levers *b b* are in their elevated positions.

The reservoir is provided with two slide-valves *r'* to be operated by the devices of the respective tracks. When the levers *b b* are depressed and the shaft *e'* caused to turn in one direction, as above explained, one of the valves *r'* of the reservoir *r* (both of said valves being normally closed) will be opened through the medium of crank-arm *r²* and valve-rod *r³*. A pipe *s* leads from the reservoir to a cylinder *t*, located under the gate. This cylinder is provided with an air outlet or vent *x* at or near its upper end and a plunger, with which latter a jointed plunger-rod *t'* is connected, the other end of said plunger-rod being attached to the gate. When the levers *l* are depressed, as above described, the sleeve *h* will be raised in an obvious manner, and the spring *i'* will force the dog or catch *i* upwardly, so as to be in position to engage the lug *j* on the gate when the latter is raised, which latter will be accomplished in the manner presently explained.

When the levers *l* are depressed by the wheel on the train, the levers *b* and the catch *i* will be reset, as above explained, and during the first portion of this downward movement of said levers *l* the slide or escape valve *r'* in the reservoir *r* will be closed by the reverse oscillation of shaft *e'*. The downward movement of the levers *l*, causing the shaft *e'* to oscillate through the medium of the crank-arm *m*, will cause the free end of the long arm *n* to move upwardly, and the plungers, which operate in the cylinders *o*, being connected with said long crank-arm the air will be compressed in said cylinders and forced into the reservoir through the pipe *q*. This reservoir being connected with the cylinder *t* and the valve *r'* of the reservoir being closed, the compressed air will flow to the cylinder from the reservoir and move the piston or plunger in the cylinder *t* upwardly, thus causing the gate to be raised, said plunger or piston being connected with the latter in the manner above explained.

The gate is so counterpoised as to be nearly in equilibrium, but with the tendency to fall. The inertia developed during the rising of

the gate will carry it the slight distance required for the piston to pass the air outlet or vent *x*. When the gate shall have reached its normal raised position, the dog *i* will engage the lug *j* and retain said gate raised. The pistons for compressing the air will be so made as to have a capacity sufficient to supply a pressure capable of raising the gate with a reasonable surplus to provide against leakage. This surplus will escape by means of air outlet or vent *x* in the cylinder *t* when the gate shall have been raised to the proper position.

My improvements, as above described, apply to a double-track road, and the reason for providing the escape-valves *r'* (one for each track) is to provide for the contingency of two trains arriving at the crossing at nearly the same time. These valves insure the gates remaining down while there is a train within a given distance of the crossing on either track, for it is apparent that if two trains approach the crossing at nearly the same time both valves *r'* will be opened, and when one of them is closed by the train which first passes the crossing the air, instead of passing to the cylinder *t*, will escape through the other valve, and therefore the gate will not be raised until the second train shall have passed the levers *l* in the track on which it is running.

I have above described my improvements applied to one track or a double-track railway. The various devices will be duplicated for the other track, with the exception of the reservoir *r*, the locking device for the gate, and the pneumatic device attached to the gate. The shaft *g²* for connecting the devices of the off track with the locking device of the gate is made of sufficient length to extend transversely under both tracks.

In Figs. 4, 5, 6, 7, 8, and 9 the positions of the valves *r'* of the reservoir under the various conditions are shown.

In Fig. 4 the valves are shown in the positions they will assume when two trains are approaching the crossing, both having passed the levers *b*, released the gate, and set the pumps in position to be acted upon by the train.

Fig. 5 shows the position of the valves when the first train has just reached the levers *l*, about one-tenth stroke being necessary to close the valve.

Fig. 6 shows the positions of the valves when the train has passed, the stroke being completed. As the second train has not reached the crossing, the valve connected with one track remains open, and the air forced into the reservoir by the passage of the first train will be permitted to escape. When, however, the second train reaches the crossing, it closes the valve, thus permitting the air to be compressed to operate the gate.

For a single-track road the appliances would be practically the same as above described, but the construction would involve

two wheels on the bogie-truck of the locomotive instead of one, (one at the center and the other midway between that and the right-hand wheel of the locomotive.) The first or 5 outer levers would be so placed as to receive the wheel midway between the side and center wheels, while the lever at the crossing would be worked by the center wheel.

My improvements are simple in construction, durable, not easy to get out of order, and are effectual in every respect in the performance of their functions.

Having fully described my invention, what I claim as new, and desire to secure by Letters 15 Patent, is—

1. The combination with a railroad-gate and devices for maintaining said gate normally raised and releasing it, of a cylinder having its piston connected with the gate for 20 raising the latter, a reservoir communicating with the cylinder, a pump for forcing air into said reservoir, two outlet-valves for said reservoir, and devices adapted to be operated respectively by trains moving in opposite directions, each set of devices being constructed 25 to operate said pump and one of said outlet-valves, whereby to cause the gate to be raised or to prevent it from being raised in case a second train approaches the crossing concurrently or nearly so with the first train, substantially as set forth. 30

2. The combination with two or more railroad-tracks, a gate for closing a crossing over said tracks and means for maintaining said 35 gate normally raised and releasing it, of a cylinder having its piston connected with the gate for raising it, a reservoir communicating with said cylinder, pumps for forcing air into said reservoir, outlet-valves for said reservoir, corresponding in number with the number 40 of tracks, track instruments for each track, devices connecting said track instruments with the pumps which charge the reservoir, and connections between the track instrument of each track and one of the outlet-valves of the reservoir, whereby to cause the 45 gate to be raised when a single train passes the crossing and prevent it from rising when

more than one train approaches the crossing at or near the same time, substantially as set 50 forth.

3. The combination with a railroad-gate, of a dog or catch adapted to engage said gate to retain it in a raised position, an enlargement 55 on said dog, a sleeve adapted to inclose said enlargement and having a shoulder to engage the same, a spring to retain the dog normally in engagement with the gate, a bell-crank lever connected to said sleeve, levers pivoted 60 between the rails of the track and adapted to be depressed by a train, and means between said levers and the bell-crank lever whereby the depression of said first-mentioned levers will operate the dog to release the gate, substantially as set forth. 65

4. The combination with a railroad-gate, of a catch adapted to maintain the gate normally raised, pneumatic devices for raising the gate, 70 two track instruments to be operated by a train, an oscillatory crank-shaft having a series of arms, said arms being connected respectively with said catch, the two track instruments and the pneumatic devices, substantially as set forth.

5. The combination with a railroad-gate, of 75 a catch adapted to maintain said gate raised, devices adapted to be operated by a train to actuate said catch to release the gate, a cylinder, a plunger in said cylinder and connected with the gate, a reservoir communicating with 80 the cylinder, a pump communicating with said reservoir, an oscillatory shaft having an arm connected with the plunger of said pump, a lever pivoted between the rails of the track and adapted to be depressed by a train, a rod 85 connected to said pivoted lever, and a crank-arm projecting from said oscillatory shaft and connected with said rod, substantially as forth.

In testimony whereof I have signed this 90 specification in the presence of two subscribing witnesses.

FRANK NEWELL.

Witnesses:

G. L. JORDY,

T. H. LA FETRA.