(No Model.)

2 Sheets—Sheet 1.

C. R. BROOKS.

AUTOMATIC GATE FOR RAILWAY CROSSINGS.

No. 344,029. Patented June 22, 1886.

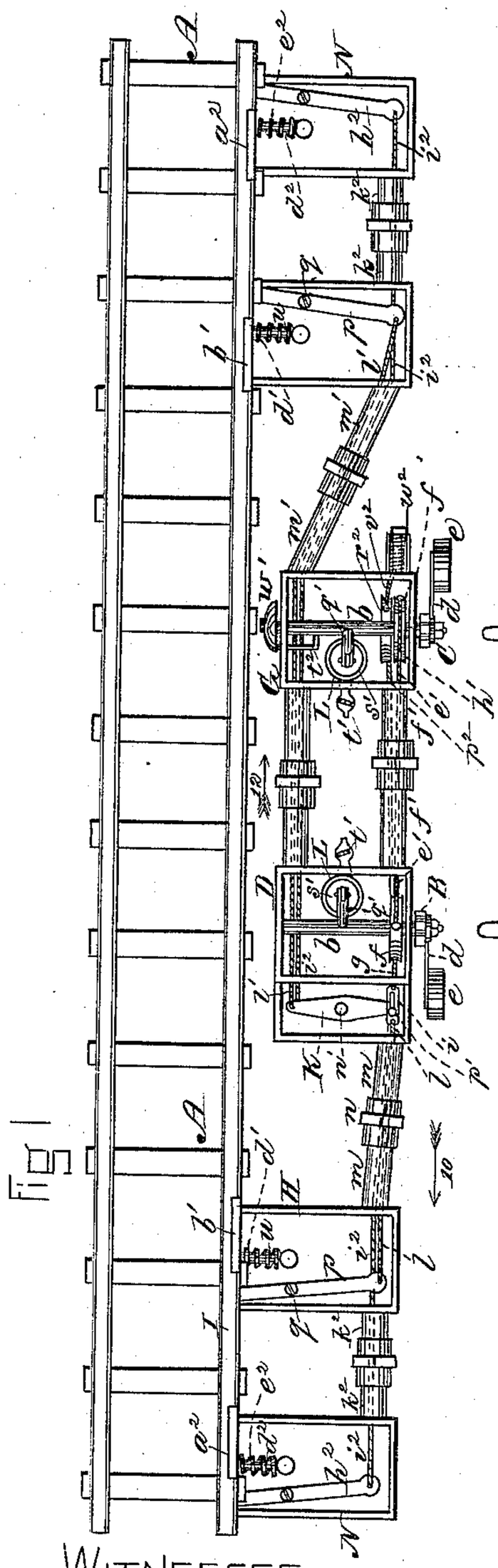

Fig 1

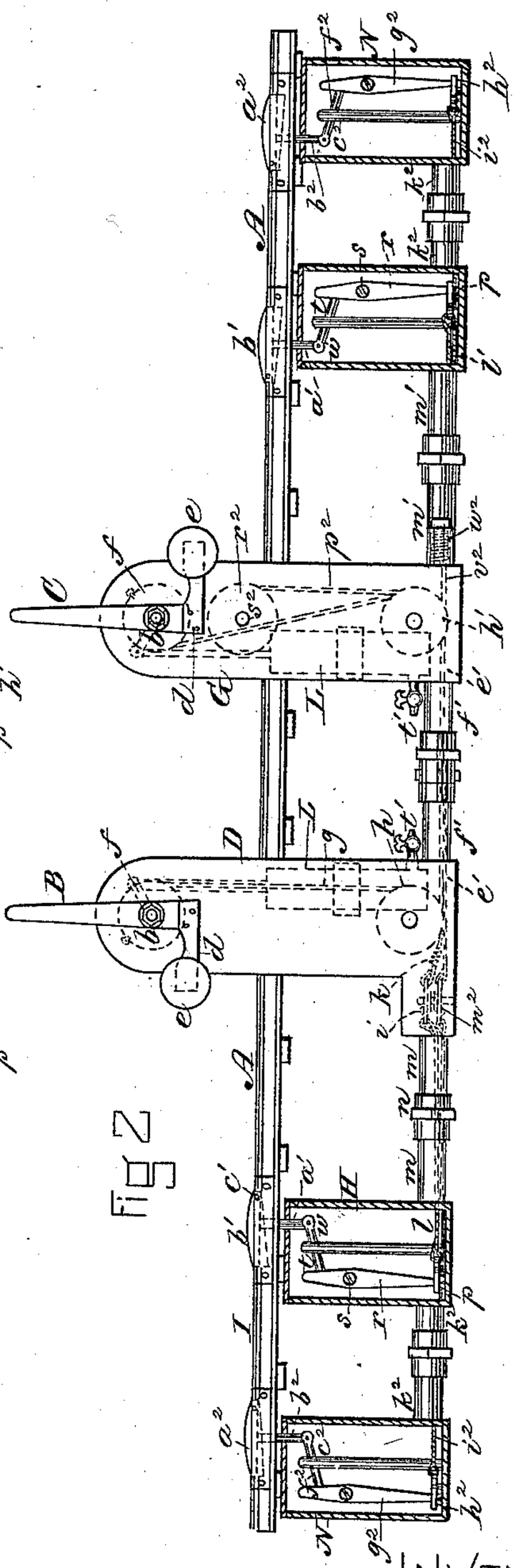

Fig 2

WITNESSES

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(No Model.)

2 Sheets—Sheet 2.

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Fig 3

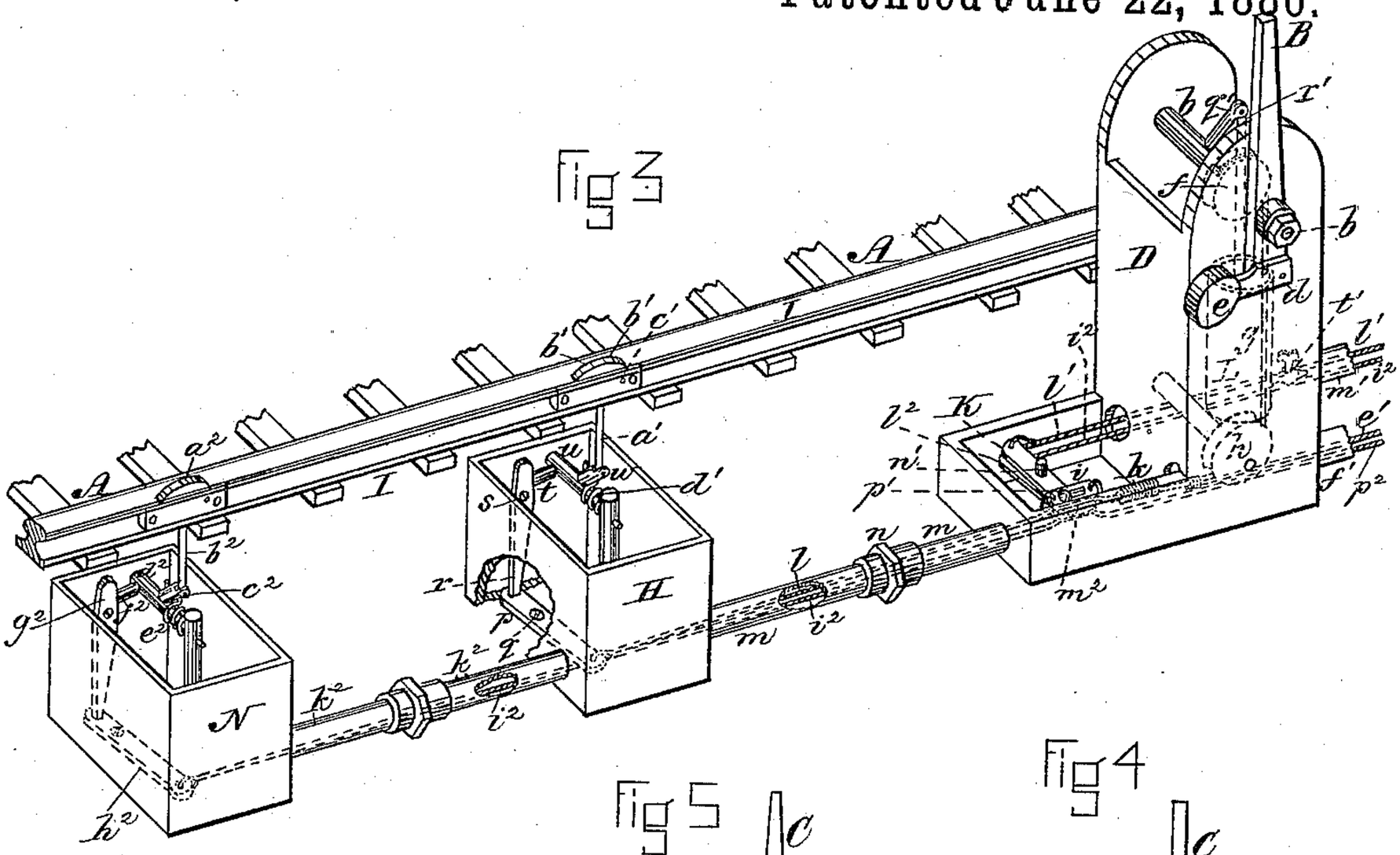


Fig 5

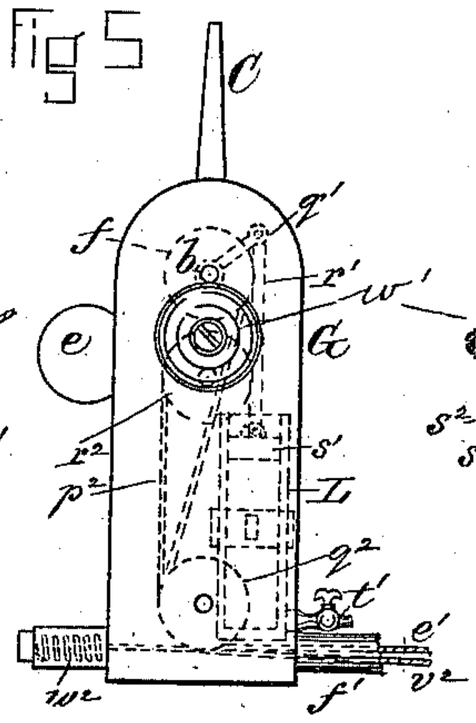


Fig 4

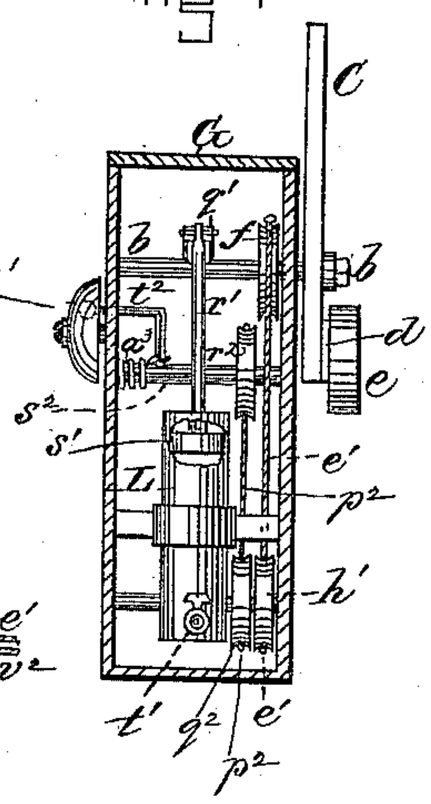


Fig 6

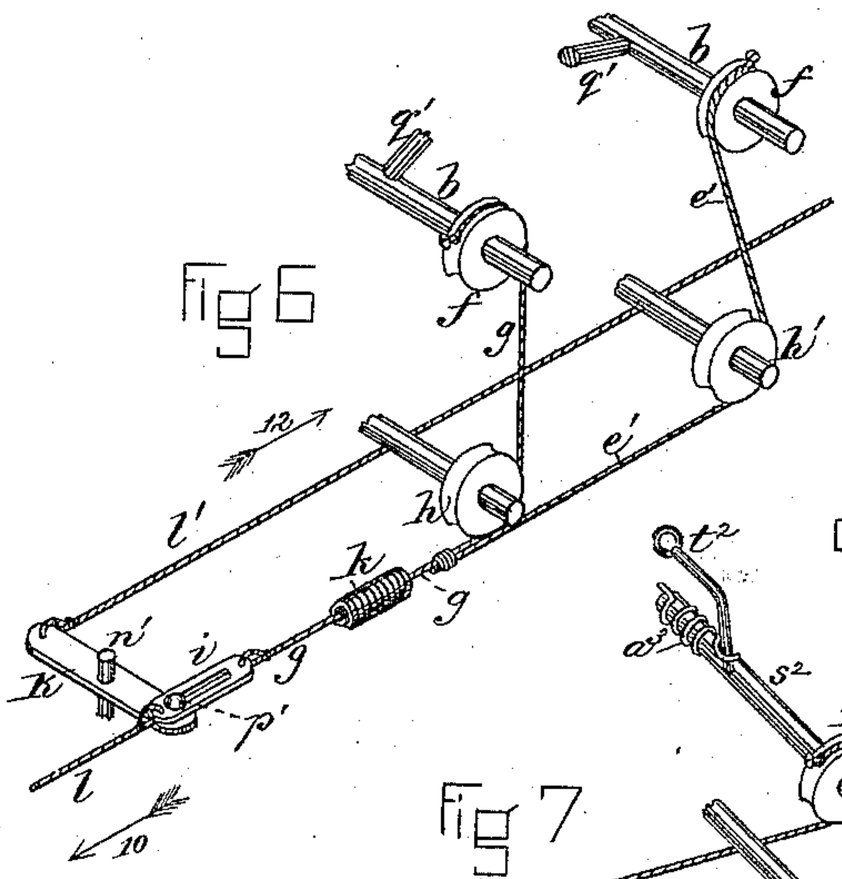
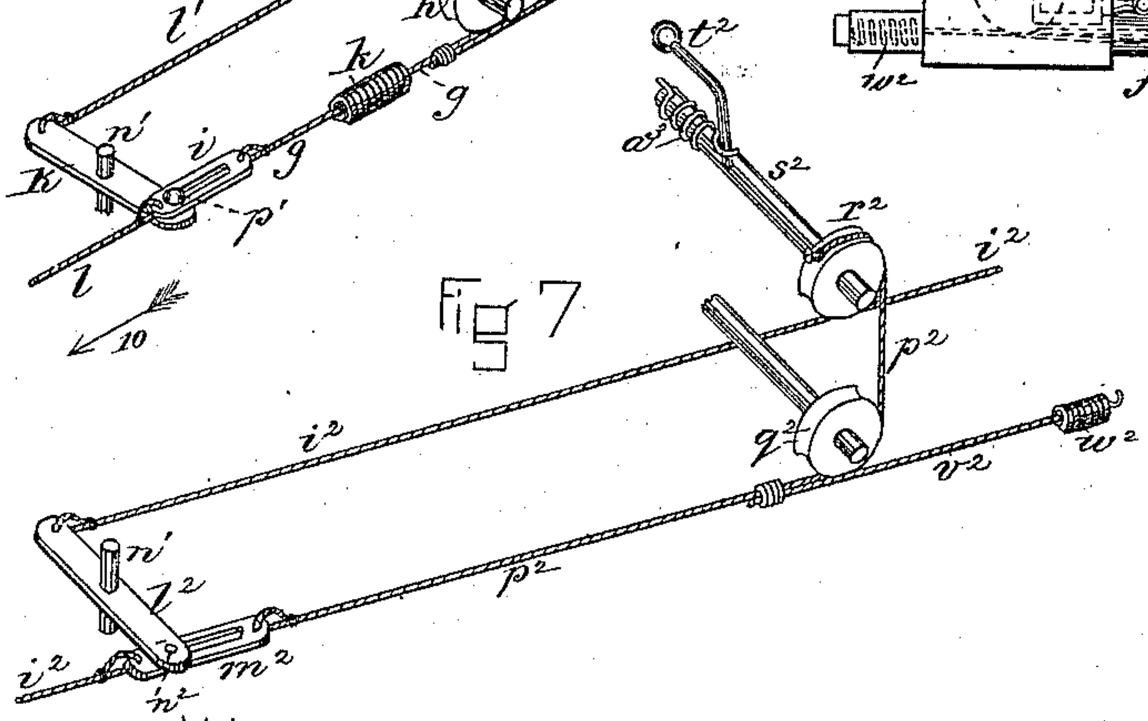


Fig 7



WITNESSES

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H. A. Decatur

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UNITED STATES PATENT OFFICE.

CHARLES R. BROOKS, OF NEW DURHAM, NEW HAMPSHIRE, ASSIGNOR TO CHARLES BROOKS, OF SAME PLACE.

AUTOMATIC GATE FOR RAILWAY-CROSSINGS.

SPECIFICATION forming part of Letters Patent No. 344,029, dated June 22, 1886.

Application filed July 24, 1885. Serial No. 172,587. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. BROOKS, a citizen of the United States, residing at New Durham, in the county of Strafford and State of New Hampshire, have invented an Improved Automatic Gate for Railway-Crossings, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan of a portion of a railway-track having my automatic gate applied thereto, the mechanism for operating the same being uncovered and exposed to view. Fig. 2 is a sectional elevation of the same. Fig. 3 is a perspective view of one of the gates and a portion of my improved mechanism for operating the same. Fig. 4 is a sectional elevation of one of the gate-posts, showing the mechanism contained therein. Fig. 5 is a side elevation of the same. Fig. 6 is a perspective view illustrating a portion of the mechanism for operating the gate. Fig. 7 is a perspective view illustrating a portion of the mechanism for operating the alarm-bell.

My invention relates to that class of railway-gates which are operated automatically by the passage of a train in either direction; and it consists in a novel construction and arrangement of mechanism whereby the movement of a lever or pivoted tread-bar operated by the wheels of the train is communicated, through a system of levers and wire ropes passing over pulleys, to the gate or gates, in order to close the same against the action of a weight by which the gate is raised; and my invention furthermore consists in certain details of construction, as hereinafter set forth and specifically claimed.

In the said drawings, A represents the railway-track, and B C the gates, which consist of vertically-swinging bars secured to horizontal rock-shafts *b b*, having their bearings in the hollow gate-posts D G, located on opposite sides of the crossing. Each of these pivoted gate-bars has secured to its inner end an arm, *d*, provided with a heavy weight, *e*, of sufficient size to automatically raise or open the gate and maintain it in a vertical position, as seen in the drawings.

To the shaft *b* of the gate B is immovably secured a pulley, *f*, to the periphery of which is attached a wire rope, *g*, which is led down over a guide-pulley, *h*, near the bottom of the gate-post D, and is secured to one end of a slotted link, *i*, Fig. 6, a stiff spiral spring, *k*, being introduced into the length of the rope *g*, between the said link *i* and the pulley *h*, for a purpose to be hereinafter described. To the opposite end of the link *i* is secured a wire rope, *l*, which passes through underground conducting-tubes *m*, having suitable couplings, *n*, and is secured to a horizontal lever, *p*, pivoted at *q* to the bottom of a covered box or casing, H, sunk in the ground beneath the level of the track and close to the same, the box being placed at any suitable distance from the gate, as seen at the left-hand side of Figs. 1 and 2. The short arm of this lever *p* is provided with a slot or aperture, within which is fitted so as to move therein the lower end of a vertical lever, *r*, pivoted at *s* to one end of the box H, and against the upper short arm of this lever *r* bears a crank-arm, *t*, projecting from a horizontal rock-shaft, *u*, mounted in suitable bearings, and having a second crank-arm, *w*, to the outer end of which is pivoted a vertical rod, *a'*, upon the upper end of which bears a tread bar or lever, *b'*, which is pivoted at *c'* to the side of the rail I, and lies within a notch cut in the same, as seen in Figs. 1 and 3, its upper surface extending slightly above the level of the rail into a position to be struck and depressed against the resistance of a returning-spring, *d'*, by the wheels of a passing train.

The tread-bar may, if desired, be placed on one side of the rail in a position to be struck by the flange of the wheel; but I prefer to arrange it, as shown, to be acted upon by the tread of the wheel, as I consider its action more certain, and that it is less liable to become clogged or obstructed by snow and ice.

To the wire rope *g*, close to the pulley *h* in the gate-post D, is secured a wire rope, *e'*, which is led through conducting-tubes *f'* to and around a guide-pulley, *h'*, within the bottom of the gate-post G, and thence up to the pulley *f* of the shaft *b* of the gate C, to the pe-

riphery of which it is secured, as seen in Figs. 1 and 6, and thus as the wire rope *l* is drawn in the direction of the arrow 10 by the depression of the tread-bar *b'*, acting through the lever mechanism described, the gates B C are simultaneously drawn down or closed against the resistance of their weights *e*.

The gates are closed by a train approaching from the opposite or right-hand side, the wheels of which act upon and depress a pivoted tread bar or lever, *b'*, Figs. 1 and 2, constructed precisely the same as the bar *b'*, above described, and connected by similar lever mechanism with a wire rope, *l'*, passing through underground tubes *m'*, and attached to the end of a lever, K, pivoted at the center upon a vertical stud, *n'*, as seen in Figs. 1, 3, and 6. To the opposite end of this lever K is secured a vertical pin or stud, *p'*, which projects up through the slotted link *i*, to which the wire rope *g* is secured, and is provided with a head to keep the link in place, and thus as the lever K is vibrated by the drawing of the rope *l'* in the direction of the arrow 12 its movement will be communicated, through the pin *p'* and link *i*, to the rope *g*, causing the gates to be closed in the same manner as previously described, while the rope *l* can be moved by the depression of its tread-bar to actuate the rope *g* without communicating any motion to the lever K, and by the employment of this slotted link *i* one rope will be prevented from sagging or becoming slack while the gates are being operated by the other, thus avoiding the liability of the conducting-tubes becoming obstructed by a slacking of the rope, and the possibility of breakage, caused by a sudden shock, if the ropes were slack.

I will now describe the means employed to control the movement of the gates and cause them to be closed or opened slowly or gradually, whereby the liability of accident or breakage is avoided.

Each of the rock-shafts *b* of the gates B C has secured to it a crank-arm, *q'*, to which is pivoted a piston-rod, *r'*, the lower end of which is pivoted to the piston *s'* of an air-cylinder, L, secured within the hollow gate-post, and thus as the gates are drawn down by the ropes *g e'* the air within the cylinders will be compressed and the pistons allowed to descend only as fast as the air is permitted to escape through petcocks or valves *t'*, which may be opened more or less, as desired, to allow the gates to move at the exact speed desired.

As the tread-bars are moved to their full extent by the passage thereover of each wheel of the train, it is evident that a yielding connection must be made between the said bars and the gates to prevent breakage and permit of the gradual closing of the gates. I have therefore introduced the strong spiral spring *k* into the length of the rope *g*, between the slotted link *i* and the pulley *h*, an intermittent strain being thus placed upon the spring *k* by the successive depressions of the tread-bar until the last wheel of the train has passed over it, when the gates will be closed, after which they will commence to be raised slowly by their weights *e*, the upward movement taking place only as fast as permitted by the entrance of air to the cylinders through the petcocks *t'*. These petcocks are set or adjusted to allow of the passage of more or less air, whereby the speed at which the gates are moved can be regulated with great nicety, and when these cocks are adjusted they may be locked to prevent them from being tampered with by unauthorized persons. By thus retarding the movement of the gates and causing them to rise gradually, as described, they are kept down until after the train has passed to the tread-bar *b'* on the other side of the crossing, thus avoiding liability of accident in the case of a single track, whereas if they were allowed to rise immediately after the train had passed the crossing they would be again closed down by the passing of the train over the tread-bar *b'* beyond the crossing, and might be brought down suddenly onto a person or vehicle passing thereunder after the train had gone by. I therefore regard this retardation of the movement of the gates as essential to their safe and proper operation.

On the gate-post G is an alarm-bell, *w'*, which is rung before the gates commence to close in the following manner, the mechanism employed being precisely like that employed for operating said gates.

In advance of each of the tread-bars *b'* is a similar pivoted tread-bar, a^2, which rests upon a rod, b^2, pivoted to a crank-arm, c^2, on a rock-shaft, d^2, having a returning-spring, e^2, and a second crank-arm, f^2, which bears against a vertical lever, g^2, the lower end of which is connected with a horizontal lever, h^2, to which is attached a wire rope, i^2, this mechanism being contained within a covered sunken box or casing, N, similar to the boxes H, previously described.

The ropes i^2 i^2 pass through conducting-tubes k^2 k^2, and also through the tubes *m m'*, and the rope i^2 from the right-hand box N is attached to a lever, l^2, similar to the lever K, and placed immediately beneath it, while the other rope, i^2, from the left-hand box N is secured to one end of a slotted link, m^2, similar to the link *i*, and through which passes a pin, n^2, Fig. 7, on the lever l^2. To the other end of the link m^2 is secured a rope, p^2, which passes over a guide-pulley, q^2, and is secured to the periphery of a pulley, r^2, fixed upon a rock-shaft, s^2, which carries the hammer t^2 of the bell *w'*, and thus through the connections described the hammer is caused to strike the bell each time the tread-bar a^2 on either side of the crossing is depressed by the passage over it of one of the wheels of a train. The slotted link m^2, like the link *i*, prevents one rope i^2 from being slackened while the bell is being operated by the other, and allows one rope i^2 to be moved

to ring the bell without communicating its motion to the lever l^2. To the rope p^2, close to the pulley q^2, is secured a rope, v^2, attached to a spiral spring, w^2, by means of which the rope is kept tightly stretched, and is drawn back after being moved by the action of the tread-bar mechanism. A spring, a^3, Figs. 4 and 7, is also employed to return the rock-shaft s^2 and hammer t^2 to their normal positions after each stroke upon the bell.

The tread-bars a^2 may be located at any desired distance in advance of the tread-bars b', so as to give timely notice of the approach of the train and the closing of the gates.

Instead of wire ropes, as described, chains, or chains and rods, may be employed, if preferred, and instead of the air-cylinders being immovably secured in place within the gate-posts they may be arranged to oscillate, if desired.

Where a double track is employed, the tread-bars b' a^2 on one side of the crossing will be on one track and those on the other side of the crossing will be on the other track, in order that the gates may be properly operated by trains approaching from either direction.

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

1. The combination, with a swinging railway-gate composed of a pivoted bar mounted on and secured to a rock-shaft, b, supported in a suitable post or standard and provided with a pulley, f, said bar having a weight, e, operating to raise the same automatically and hold it in a vertical position, of the levers or tread-bars b' b', the rods a' a', rock-shafts u u, with their crank-arms t t w w and springs d' d', the levers r r p p, wire-rope connections, substantially as described, between the said levers p p and the pulley f of the shaft b, on which the gate is mounted, and the spring k, all constructed to operate substantially in the manner and for the purpose set forth.

2. The combination, with a swinging railway-gate composed of a pivoted bar mounted on and secured to a shaft, b, having a pulley, f, said bar having a weight, e, to raise the same automatically, of the rope g, passing over the pulley h and secured to the pulley f, and having the spring k, the lever K, having the rope g connected therewith, the ropes l l', connected with the opposite ends of the lever K, to move the rope g in the same direction, the conducting-tubes m m', the levers p p, having the ropes l l' secured thereto, the levers r r, to operate the levers p p, the rock-shafts u u, with their crank-arms t t w w and springs d' d', and the rods a' a', pivoted to the crank-arms w w and connected with the levers or tread-bars b' b', all constructed to operate substantially in the manner and for the purpose described.

3. The combination of a swinging railway-gate secured to a rock-shaft, b, having its bearings in a hollow gate post or standard operated automatically by mechanism, substantially as described, connected with a lever or tread-bar, an air-cylinder, L, secured within the hollow gate-post and provided with a petcock or valve, t', made adjustable to regulate the egress and ingress of air, and having the piston s' and piston-rod r', the latter being connected with the crank-arm q' on the rock-shaft b, all constructed and arranged to operate in the manner and for the purpose described.

4. The combination, with the swinging railway-gates, the rock-shafts b, the lever K, having the pin p', and the ropes l, l', and g, connected with said lever, of the slotted link i, fitting over the pin p', and having the ropes l and g secured to its opposite ends, whereby the rope l can be moved by the depression of its tread-bar to actuate the rope g without communicating its motion to the lever K, substantially as set forth.

Witness my hand this 21st day of July, A. D. 1885.

CHARLES R. BROOKS.

In presence of—

P. E. TESCHEMACHER,

W. J. CAMBRIDGE.