(No Model.) 3 Sheets—Sheet 1.

C. F. STRACK.

Railway Gate and Signal Apparatus.

No. 243,001. **Patented June 14, 1881.**

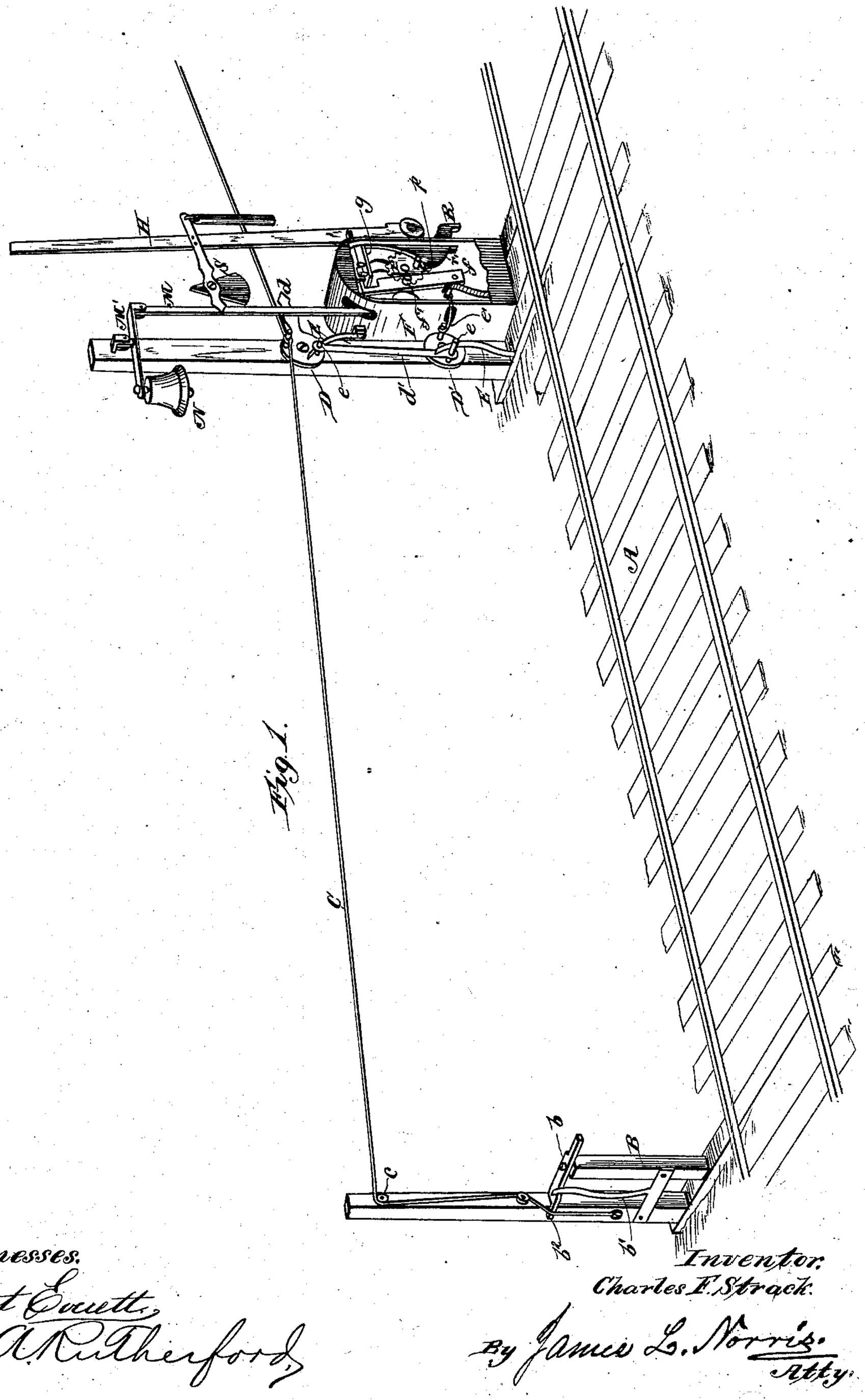

Fig. 1.

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Fig. 2.

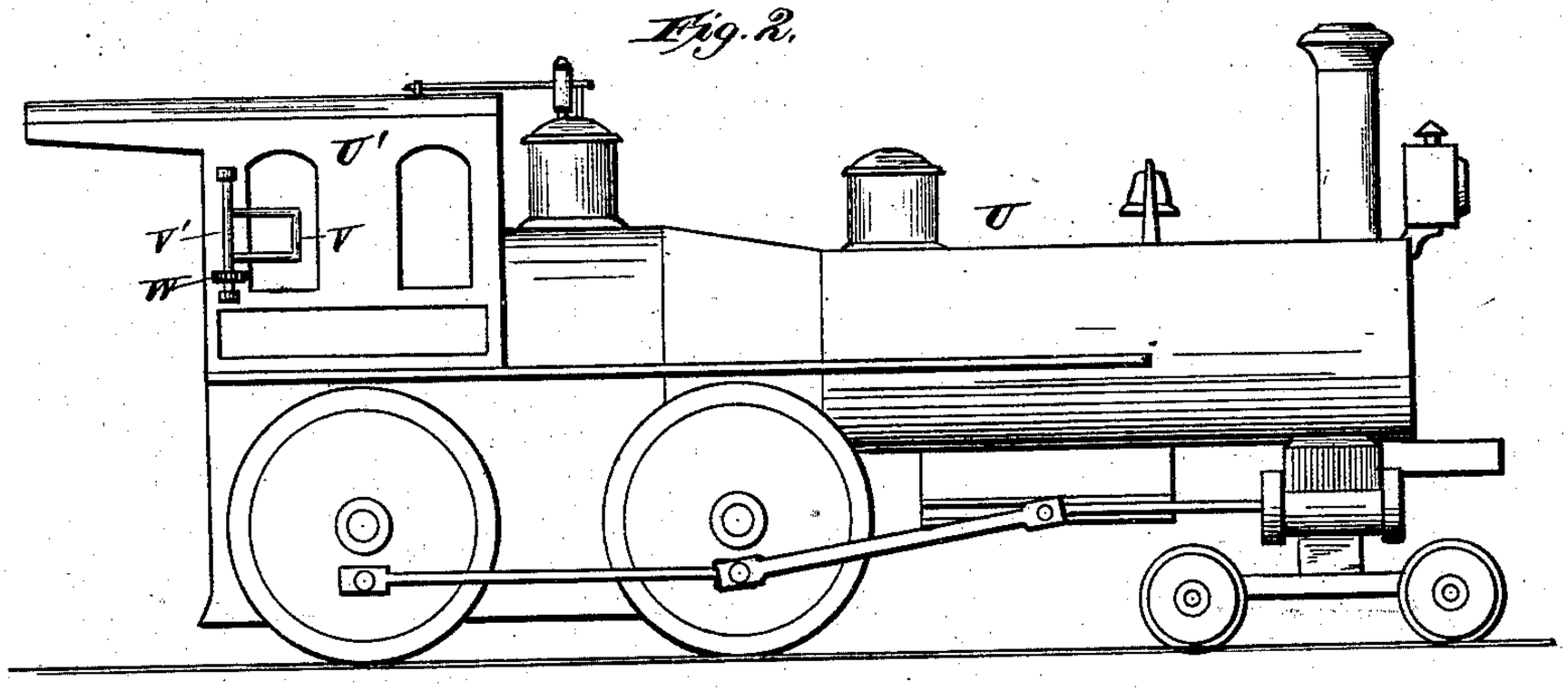

Fig. 3.

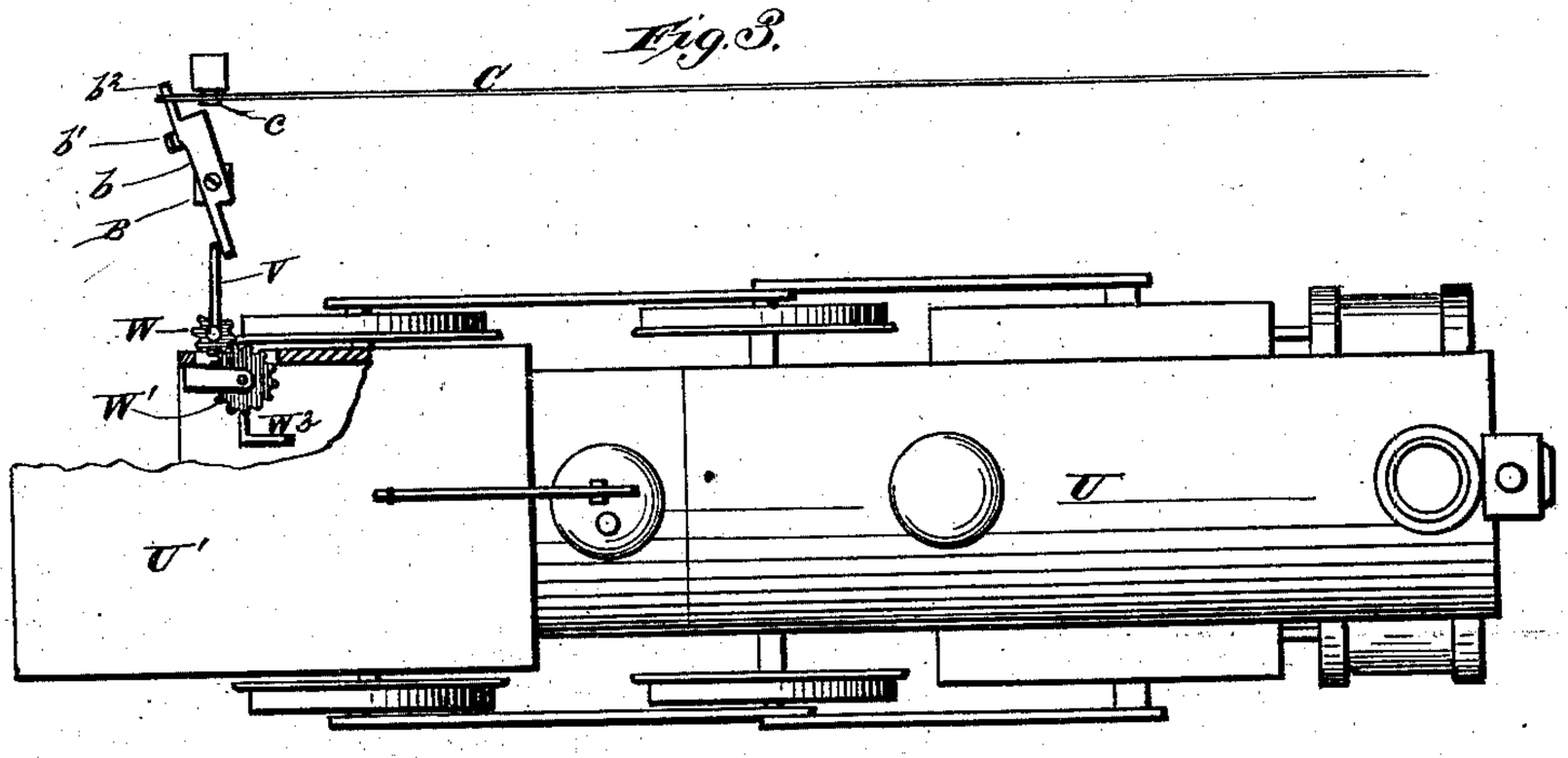

Fig. 4.

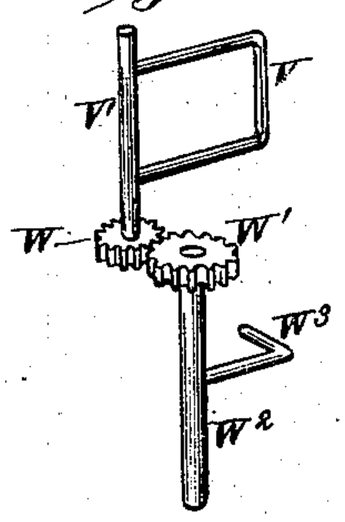

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Fig. 5.

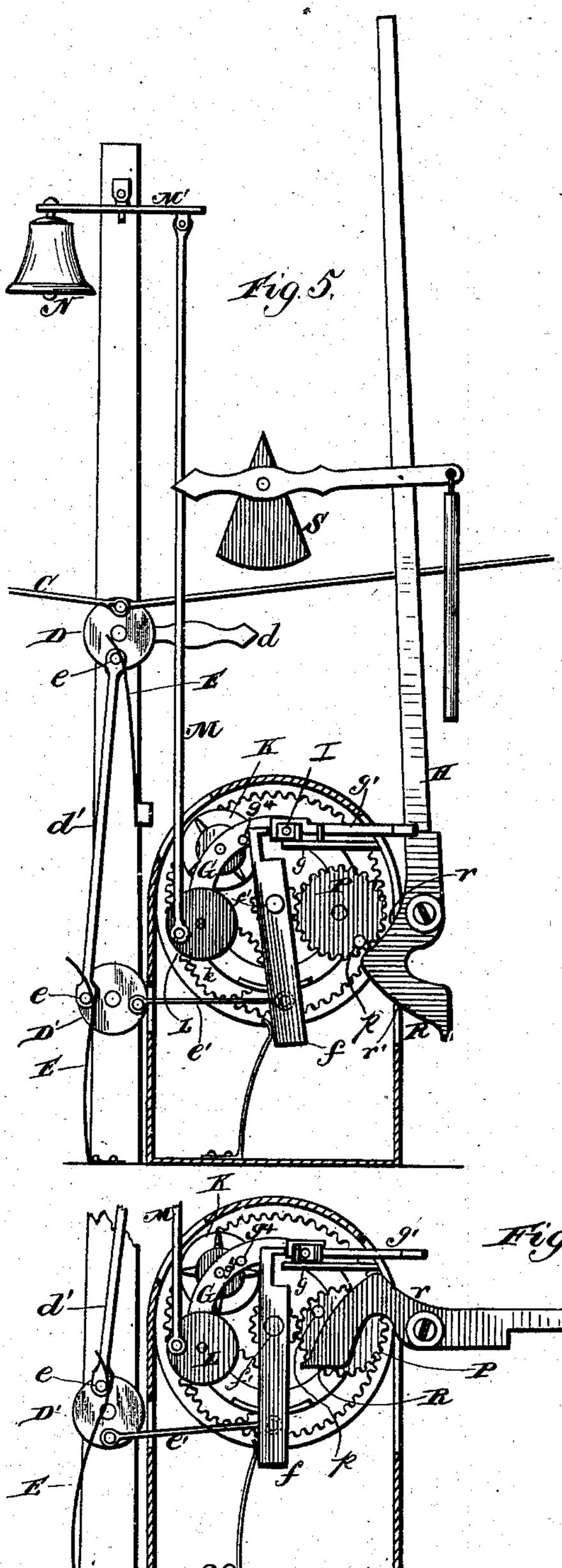


Fig. 6.

Fig. 7.

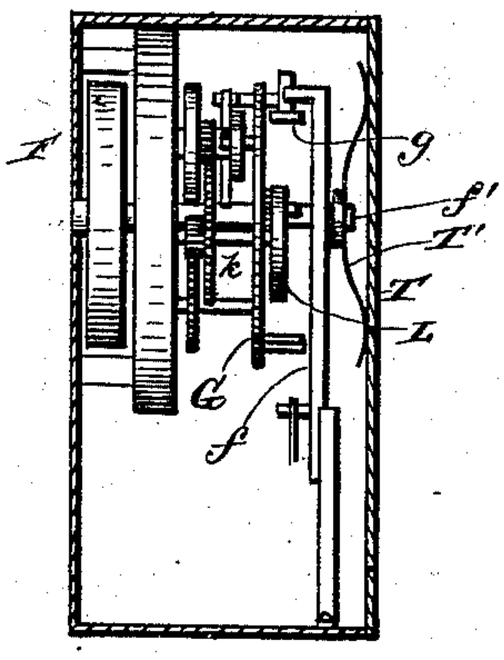
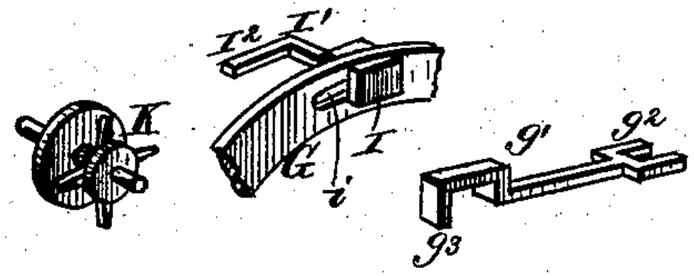


Fig. 8.



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UNITED STATES PATENT OFFICE.

CHARLES F. STRACK, OF FORT WAYNE, INDIANA.

RAILWAY GATE AND SIGNAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 243,001, dated June 14, 1881.

Application filed April 9, 1881. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. STRACK, a citizen of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented new and useful Improvements in Railway Gates and Signal Apparatus, of which the following is a specification.

My invention relates to a railway gate and signal apparatus that is employed at railway-crossings, both for the purpose of giving timely warning of the approach of a train, and for automatically raising and lowering the gate, so that in the event of a person passing along the road not heeding the danger-signal his passage across the track will inevitably be arrested by the gate. The signal medium employed is a bell which can be heard a long way off, so as to give persons hearing the same ample time to take the precautionary measures usual in such cases.

The apparatus which I employ is set in operation by the action of an arm upon the locomotive against a tripper that is arranged at some distance from the crossing—say the eighth of a mile. This tripper connects with the apparatus by a cord or wire, so as to release certain portions of a clock mechanism in the apparatus that is impelled as soon as liberated by spring or weight power. As soon as this mechanism is set in motion the bell commences to ring and the gate begins to descend across the track, the same mechanism serving to raise the gate at the proper time after the train has passed the crossing.

The features of improvement in this apparatus will be fully described in the following specification, and specifically indicated in the claims.

In the accompanying drawings, Figure 1 represents my improved signal apparatus set up alongside of a railway-track. Fig. 2 is a side elevation of a locomotive, with one of the tripping-arms swung back upon the cab. Fig. 3 is a top or plan view of the same, with a portion of the cab broken away to show one of the tripping-arms and devices for swinging the same away from or toward the side of the cab. This view also illustrates the tripper. Fig. 4 is a perspective view of the tripping-arm and its adjuncts detached from the cab. Fig. 5 is a side elevation of the signal apparatus and the gate on an enlarged scale, the gate being raised. Fig. 6 is a like view of a portion of said apparatus with the gate lowered. Fig. 7 is an end view of the clock mechanism for operating the gate and bell. Fig. 8 represents, in detail, a spur-wheel, a sliding dog that checks and releases the same, and a movable arm that is to be engaged upon the said dog, these devices being part of the apparatus, as hereinafter described.

A indicates the rails of the railway-track, and B a pair of posts that will be located alongside of the track at some distance from the crossing. One of these posts is taller than the other, and upon the shorter post is pivoted the tripper *b*, that is extended out from its pivotal point, so as to project over the track, in which position it is normally held by a spring, *b'*, and an arm, b^2, of the tripper, that abuts against the taller post, so as to prevent the spring from forcing it past the latter.

C is a cord or wire that is secured to the taller post and passes up and over a pulley, *c*, near the top of the same, the position of the cord being such that when the tripper is turned upon its pivot its arm b^2 will press against the cord, and thus cause a proper degree of tension upon a crank, D, with which the cord is connected. This crank-wheel is arranged upon an upright alongside the signal apparatus, that is located alongside the track, near the crossing. It is provided with an arm or index, *d*, by means of which it can be operated by a person at the crossing, if desired, and it is connected with a lower crank-wheel, D', by means of a pitman, *d'*, so that a partial rotation of the upper wheel will cause a like movement on the part of the lower one. Springs E E are arranged to bear against pins *e e* upon the pitman, in order to restore the same and the wheels to their normal positions after the tension of the wire upon the upper wheel has been released. A cord or wire, *e'*, passes from a wrist-pin upon the lower crank-wheel through the casing F, that contains the clock mechanism or train of gearing, and connects with the lower end of a vibratory lever, *f*, that is arranged upon an arbor of the central shaft, *f'*, of the train of gear-wheels. The vibration of this lever in one direction is checked by a

stop, g^4, upon a semicircular frame, G, while its vibration in the opposite direction is limited by contact with a plate, g, upon which the arm g' (shown more clearly in Figs. 5, 6, and 8) is arranged to slide. The upper end of the vibratory lever is adapted to act upon said arm, in order to throw it forward against the gate H, that is pivoted alongside the casing, said casing being provided with a suitable opening for the arm to work through. The arm g' is provided at one end with a fork, g^2, so that the same will embrace the sides of the gate, while at its inner end, g^3, it is bent into rectangular form, in order to fit upon a block or plate, I, of the movable dog I′. This dog has two of these plates I, one upon each side of the semicircular frame G, said plates being connected by a pin or bolt passing through a slot, i, in said frame, whereby the dog will be properly guided in its movement. The said dog has a bent arm, I^2, that engages the spur-wheel K of the train of gearing when the arm g' is retracted to its farthest extent within the casing, and which releases said spur-wheel as soon as the arm g' has been pushed forward so as to move the dog away from the spur-wheel.

The train of gearing employed may be of any ordinary or suitable construction, such as is incident to clock mechanism adapted to be wound up by a key and impelled, when free to operate, by a weight or spring, and need not therefore be described in detail. Fig. 7 illustrates one arrangement, the gears k being arranged to intermesh as usual, and their shafts being journaled in the frame G. Upon one of the shafts of this train of gearing is a crank-wheel, L, to the wrist-pin of which is connected a pitman, M, that extends up through a slot in the casing to a pivoted lever, M′, upon one end of which is arranged a bell, N, so that the rotation of said crank-wheel will vibrate the lever, and thereby ring the bell. Upon one of the larger gear-wheels P of the train of gearing is a pin, p, arranged to act upon the lower cam-shaped end, R, of the pivoted gate, that extends through a slot in the side of the casing. One portion of the cam-shaped end of the gate has a curved recess, r, against which the said pin acts during a certain portion of the revolution of the wheel, to prevent the gate from descending too rapidly, as presently explained. Said end is also formed with the slightly-curved end edge, r', against which the said pin, during another portion of the rotation of the wheel, will act to raise the gate. The gate is provided, if required, with a weight, S, and it is so pivoted that when raised to the fullest extent it will lie over against the projecting forked end of the arm g', as illustrated in Fig. 5.

In practical use the casing will have a face-plate, T, to conceal its mechanism, and a spring, T′, will be arranged upon the vibratory lever, so as to bear against the inner side of said plate, in order to prevent too rapid movement of the lever.

U indicates an ordinary locomotive, and U′ its cab. At each side of the cab will be arranged a swinging arm, V, and to place the same under easy control of the engineer I secure the arm upon a shaft, V′, provided with a gear, W, that intermeshes with a gear, W′, upon a vertical shaft, W^2, arranged within the cab, and having a handle, W^3, for the engineer to grasp. By this means he can turn the said shaft, and hence cause the arm to swing out or in at pleasure.

The operation is as follows: The gate being raised, the parts will assume the position shown in Fig. 1. At the proper time the engineer causes the arm on that side of the cab nearest to the signal apparatus to swing out. The arm strikes the tripper as the train passes, and the tripper-arm acts against the cord or wire, so as to cause sufficient tension upon the upper crank-wheel on the post adjacent to the signal apparatus to turn. This turns the lower crank-wheel through the medium of the connecting-pitman, and the lower crank-wheel causes a vibration of the lever within the casing by means of the wire or cord connecting said operative parts. As the upper end of the vibratory lever moves forward it acts against and pushes the arm g', which, in turn, moves the gate upon its pivot away from the casing. As this arm moves forward it carries with it the dog, thereby releasing the latter from the spur-wheel, at which instant the train of gearing which has been previously wound up will be set in motion. The crank-wheel of this train of gearing will cause its pitman to reciprocate, and hence vibrate the bell-lever and ring the bell as a note of warning. At the same time the gate, having been thrown out past the center of gravity by the arm g', will commence to descend. In descending the curved portion of its lower end will bear against the pin upon the gear-wheel adjacent thereto, and hence the gate can descend only as fast as the wheel rotates and carries its pin away from the said end of the gate. In this way the gate will be let down gently and all concussion avoided. The mechanism is so timed that the bell will ring the proper number of times, and the pin upon the gear-wheel will not come round to strike against the cam-shaped end of the gate until after the train has passed the crossing. After the train has passed, however, the pin upon said wheel will act against the cam-shaped end of the gate and raise and restore the same to its normal position. The springs act upon the pitman between the two cranks, and against the tripper, to move the same back to their original position as soon as the arm from the cab has been freed from the tripper. The engineer can, of course, swing the arm back as soon as it has performed its duty. A tripper will also be similarly arranged at the other side of the crossing, and can connect with this apparatus by a cord or wire, whereby one apparatus will answer for two trippers.

What I claim is—

1. The combination, in a railway signal apparatus, of the wheel carrying a pin upon its

face, with the pivoted vertically-moving gate having one end extended to bear against said pin during the descent of the gate and the rotation of the wheel, whereby the gate will be let down gradually and easily, substantially as described.

2. The combination, in a railway signal apparatus, of the pivoted vertically-moving gate having a cam at one of its ends, with the gear-wheel carrying a pin upon its face, and arranged to bring the pin against the cam end of the gate when the latter is lowered, and to elevate the gate during the rotation of said wheel by the action of the pin upon said cam, substantially as described.

3. The combination, in a railway signal apparatus, of the pivoted vertically-moving gate, with the sliding arm arranged to push the gate forward and beyond the center of gravity when the latter is in a raised position, the vibratory lever located to act upon the sliding arm and move the same forward, the tripper, and connections between the same and the vibratory lever, substantially as and for the purpose specified.

4. The combination, in a railway signal apparatus, of the pivoted vertically-moving gate, with the pivoted tripper, the upper and lower crank-wheels, D and D′, connected by a pitman, cord or wire connections between the upper crank-wheel and the tripper, and a like connection between the lower crank-wheel and the vibratory lever *f*, the arm *g′*, arranged to act upon the gate, and also to be acted upon by the vibratory lever, and the gear-wheel carrying a pin arranged to retard the descent of the gate, and also to act upon a cam at the end of the gate in order to raise the latter, substantially as described.

5. The combination, with the pivoted vertically-moving gate, of the arm *g′*, for moving the gate to a limited extent from its raised position, a train of gearing impelled by spring or weight power, the vibratory lever adapted to act upon said arm, the gear-wheel carrying a pin arranged to retard the descent of the gate, the bell, and connections between said bell and a crank-wheel upon a shaft of the train of gearing, whereby said bell will be rung during the gradual descent of the gate, substantially as described.

6. The combination, in a railway signal apparatus, of the pivoted vertically-moving gate having a cam at one of its ends, with the sliding arm arranged to push the raised gate forward, the gear-wheel provided with a pin for raising and lowering the gate, a dog carried by said sliding arm, a spur-wheel engaged by said dog, the train of gearing, and the bell actuated by said train of gearing after the dog has been released from the spur-wheel, substantially as described.

7. The combination, in a railway signal apparatus, of the wheel carrying a pin for raising and lowering the gate, and the wheel for ringing the bell during the descent of the gate, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHAS. F. STRACK.

Witnesses:

JAMES L. NORRIS,

J. A. RUTHERFORD.