(No Model.) 4 Sheets—Sheet 1.

C. F. STRACK.

RAILROAD GATE.

No. 272,099. Patented Feb. 13, 1883.

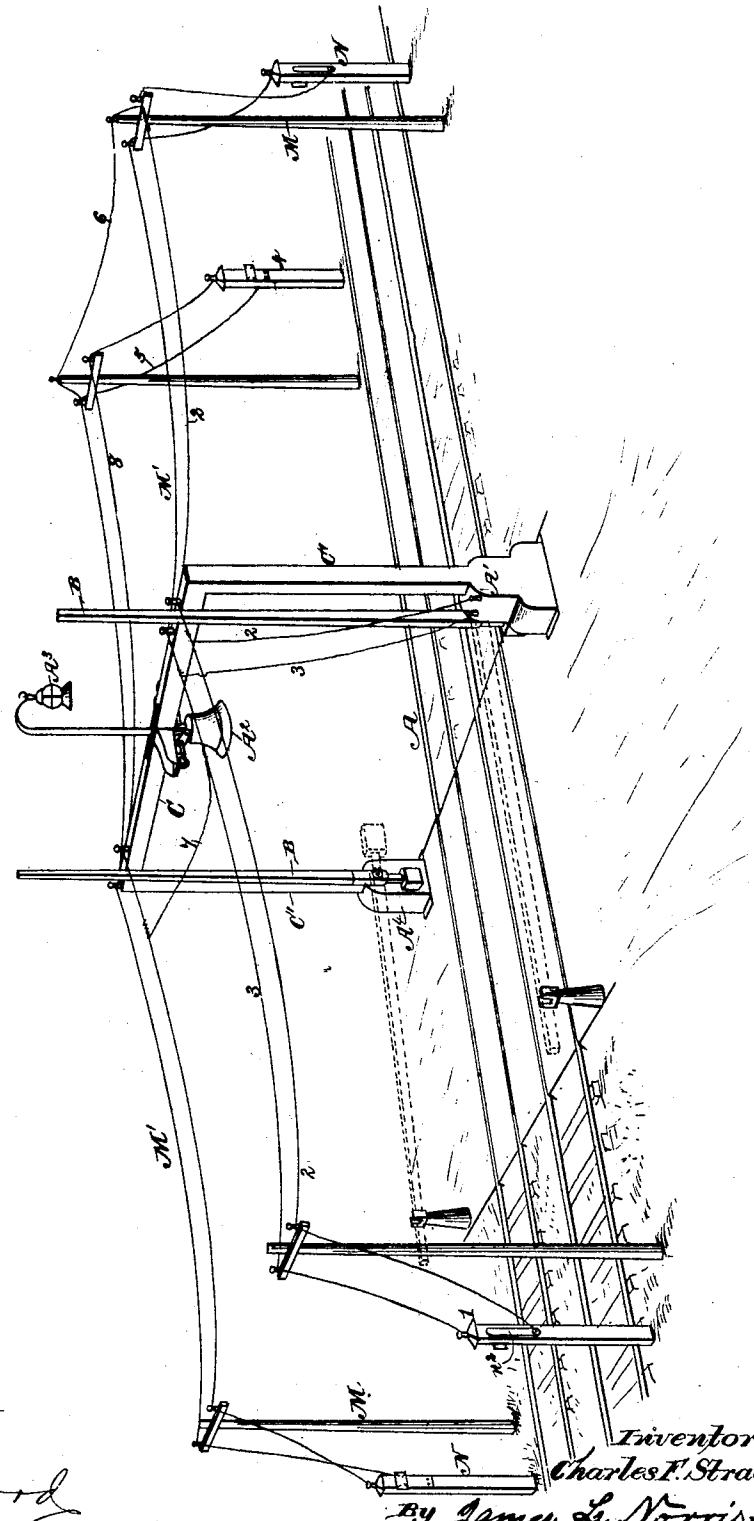


Fig. 1.

Witnesses.
Robert Everett.
J. A. Rutherford

Inventor.
Charles F. Strack.
By James L. Norris.
Atty

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 4 Sheets—Sheet 2.

C. F. STRACK.

RAILROAD GATE.

No. 272,099. Patented Feb. 13, 1883.

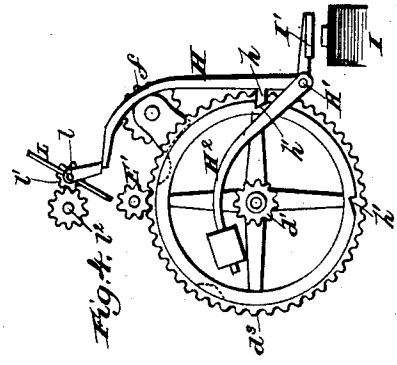


Fig. 4.

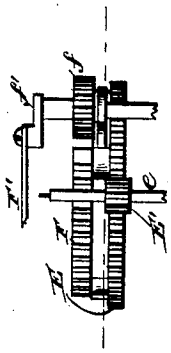


Fig. 5.

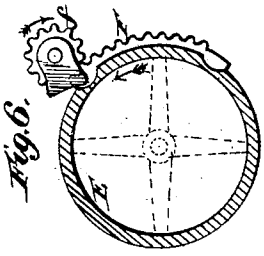


Fig. 6.

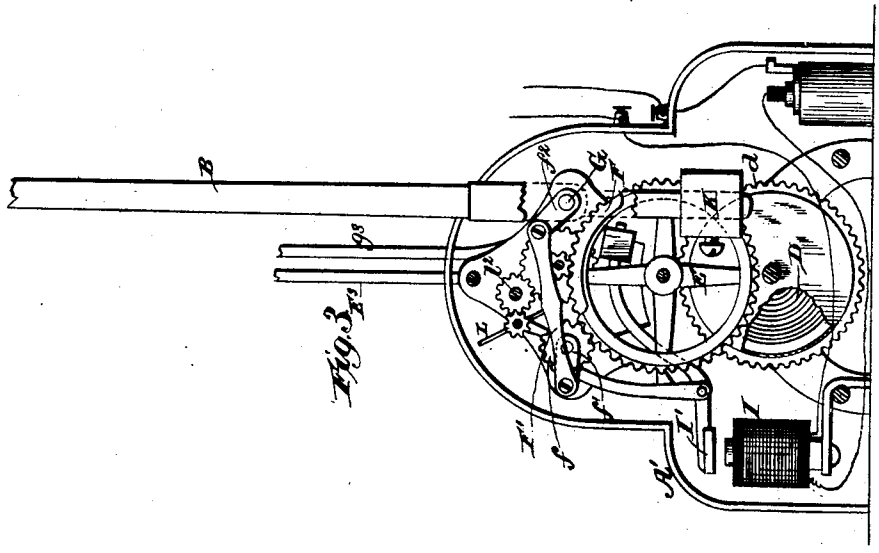


Fig. 3.

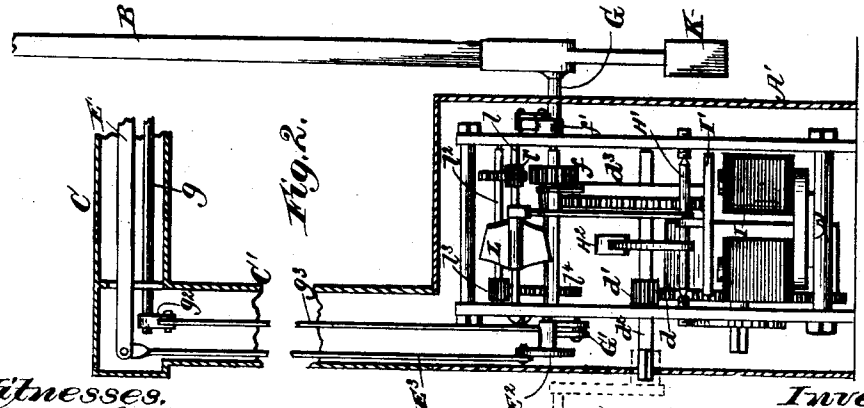


Fig. 2.

Witnesses.
Robert Everett
J. C. Rutherford

Inventor.
Charles F. Strack.
By James L. Norris.
Atty

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.)

4 Sheets—Sheet 3.

C. F. STRACK.

RAILROAD GATE.

No. 272,099. Patented Feb. 13, 1883.

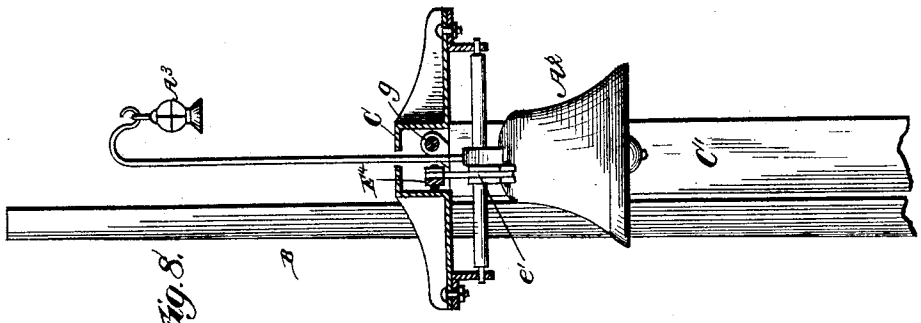


Fig. 3.

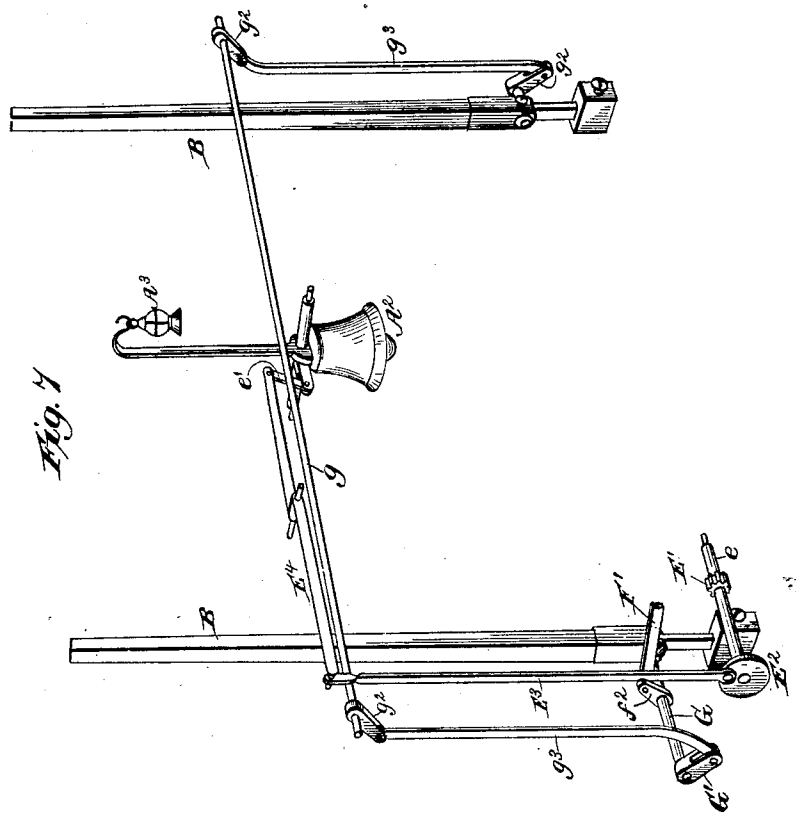


Fig. 4.

Witnesses.
Robert Everett.
J. A. Rutherford

Inventor:
Charles F. Strack.
By James L. Norris.
Atty.

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 4 Sheets—Sheet 4.

C. F. STRACK.

RAILROAD GATE.

No. 272,099. Patented Feb. 13, 1883.

Fig. 9.

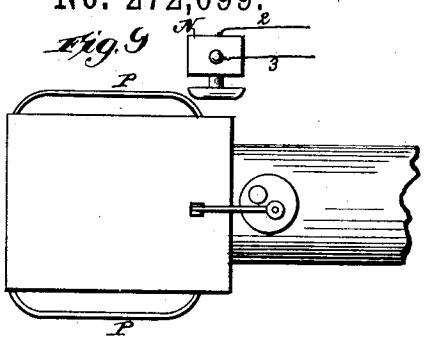


Fig. 10.

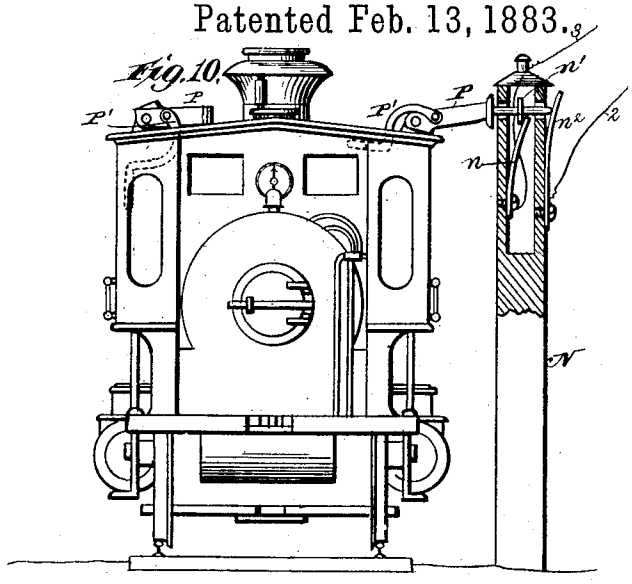


Fig. 11.

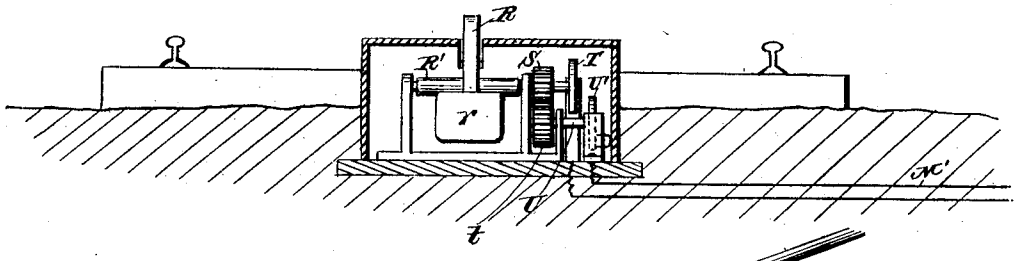
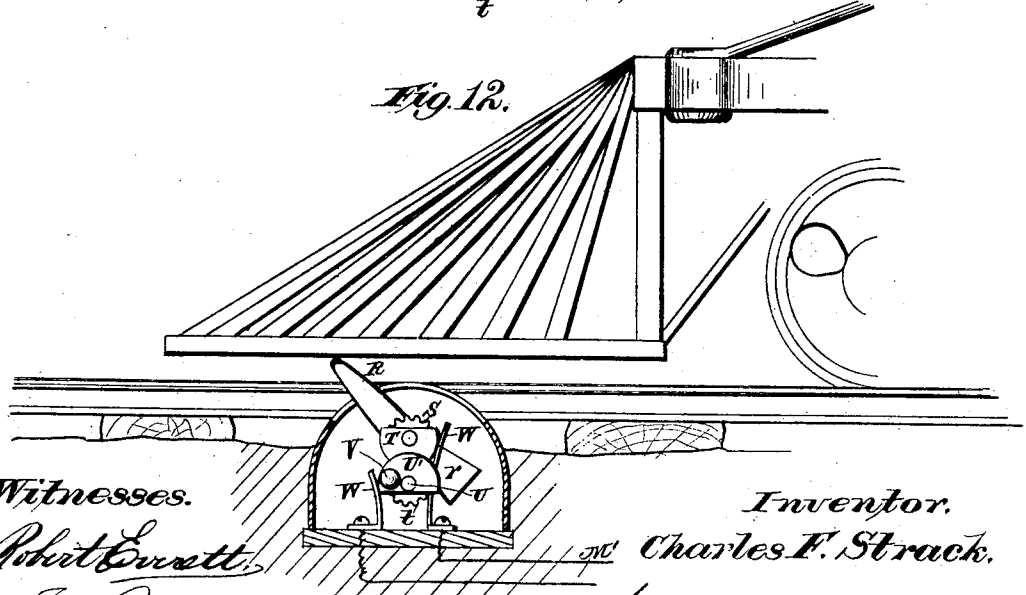


Fig. 12.



Witnesses.

Robt Everett.

J. A. Rutherford

Inventor.

Charles F. Strack.

By James L. Norris.

Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

CHARLES F. STRACK, OF FORT WAYNE, INDIANA, ASSIGNOR OF ONE-HALF TO ARTHUR M. BRACKENRIDGE, OF SAME PLACE.

RAILROAD-GATE.

SPECIFICATION forming part of Letters Patent No. 272,099, dated February 13, 1883.

Application filed August 16, 1882. (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, Allen county, Indiana, have invented new and useful Improvements in Railroad-Gates, of which the following is a specification.

This invention relates to railway-gates and signal mechanism 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 and not heeding the danger-signal his passage across the track will inevitably be arrested by the gate.

In my apparatus power for operating the gates and the signal device is stored up by means of a spring or weight, and the mechanism freed so as to operate said gates and signal by means of electro-magnets, which are thrown into circuit so as to attract an armature by a circuit make and break device actuated by the engine at a proper interval along the road. The armature, thus attracted by the magnets, liberates the mechanism which it has heretofore held in check, and allows the same to perform its required function, after which an arm of the said armature automatically checks the mechanism at the proper period, so that as soon as the gates are lowered the mechanism will be stopped, and after the train has passed the crossing and the gates been raised the mechanism, set in action at the proper moment for raising the gates, will be again automatically stopped as soon as the gates have been fully opened.

In the accompanying drawings, illustrating my invention, Figure 1 illustrates a track with my mechanism located at a crossing. Fig. 2 is a vertical section through the mechanism for operating the gates and signal device. Fig. 3 is a side elevation of said mechanism with the side of the housing removed. Figs. 4, 5, and 6 are details, principally illustrating the notched gear-wheel carrying a segmental gear, certain auxiliary devices being shown in said figures. Fig. 7 shows the two gates and the signal device with certain portions of the mechanism for actuating the same. Fig. 8 is a transverse section through the bar from which the bell is suspended, said view showing the signal devices. Fig. 9 shows one of the push-buttons and a plan view of a portion of the engine, the knocker-arms for actuating the push-buttons being in this instance rigidly secured to the cab. Fig. 10 shows the engine having a swinging bail attached to the cab, said figure also showing the standard in section, so as to disclose the push-button. Fig. 11 represents a modified arrangement of circuit make and break mechanism, the case in which the same is inclosed being shown in section. Fig. 12 illustrates the cow-catcher of a locomotive in the act of pushing down the tappet or knocker-arm of the mechanism illustrated in Fig. 11.

The letter A indicates a double-track railway; and B the gates, located at the crossing, and arranged alongside the track so as to swing up or down. At one side of the railway is located a suitable case or housing, A′, for covering and protecting the clock mechanism and certain auxiliary devices employed for actuating the gates and the signal.

As a signal medium, I propose employing both a bell, A^2, and a lantern, A^3, or a flag suspended from the bell, so that in addition to the alarm given by the bell the lantern or flag will be readily seen at night by the engineer of an approaching train. The bell is suspended below a horizontal beam or bar, C, which is supported upon standards C′, located either at opposite sides of the railway or both at one side of the same. As herein shown, the bar C crosses the road; but it will be evident that it could be arranged parallel to the same, if preferred.

The power is stored up by means of a barrel-spring, D, or a weight, upon the arbor of which spring is a gear-wheel, *d*, engaging a pinion, *d′*, upon a shaft, d^2, upon which is mounted a gear-wheel, d^3. This gear-wheel has two functions: First, it serves to operate the devices for raising and lowering the gates; and, secondly, it actuates the mechanism for operating the signal devices.

The gear-wheel E meshes with a pinion, E′, upon a spindle, *e*, carrying a wheel, E^2, with which is eccentrically connected a pitman, E^3, which in turn connects with a horizontal vibra-

tory lever, E^4, and this latter is connected with an arm extending from the bell-head by means of a link, e', whereby the rotation of the wheel E^2 will vibrate said lever, and hence cause a vibration on the part of the bell and lantern or flag so long as said wheel is caused to revolve.

As a means for raising and lowering the gate, the wheel E is provided with a segmental gear, F, which, as said wheel revolves, is brought into mesh with a pinion, f, upon the spindle of which is fixed a crank-arm, f'. This crank-arm connects by means of a pitman, F', with an arm, f^2, upon a rotary shaft, G, carrying at one end a crank, G'. One of the gates is secured directly upon this rotary shaft, while the opposite gate is actuated from said shaft through certain connections extending across the track, and illustrated in Fig. 7, whereby a rotary movement on the part of the shaft will cause both gates to move simultaneously. The said connections comprise a horizontal rock-shaft, g, extending across the track, cranks g^2, and connecting-rods g^3, as illustrated in said Fig. 7.

The mechanism described for actuating the gates and the signal is suitably protected from the weather by the housings A' and A^4, standards C', and horizontal cross-bar C, which are made in the nature of long casings suitable for containing the said devices. These standards and housings can be located on opposite sides of the railway, as herein shown, or they can both be located on one and the same side, so that the cross-bars shall be parallel with the track, the operation being the same in either case.

The device for holding the gate and signal-operating mechanism in check consists of an arm, H, provided with a short finger, h, which is received in either of two notches h', formed in the wheel E. This arm is fixed upon a rock-shaft, H', journaled in the frame of the clock mechanism, or otherwise. A weighted arm, H^2, fixed to the rock-shaft, H', normally holds the locking-arm H against the wheel E, so that its finger shall enter one of the notches when presented to the said finger.

The means for releasing the arm from the wheel, so as to allow the spring to revolve the latter, consists of the electro-magnets I and an armature, I', the arm of which is fixed upon the rock-shaft H', so that when the armature is attracted by the electro-magnets the arm H will be swung away from the wheel E, thus allowing said wheel to rotate. The notches in wheel E are located at such points on the said wheel that when the arm is released from one notch the wheel will operate for a certain period to actuate the signal or alarm mechanism before the segmental gear comes into use to cause the gates to rise, after which the said gear comes into mesh with the pinion and causes the gates to swing down, it being supposed that they are up, as indicated in Fig. 3, the finger upon the vibratory arm entering the second notch on the wheel E, and stopping the same as soon as the gates have been swung down across the crossing. At this juncture the segmental gear will still be in mesh with the pinion f, so that when the armature is again attracted by the magnets and the arm released from wheel E further revolution on the part of said wheel will cause the segmental gear to impart a further movement to the pinion, and hence cause the gates to swing up. The above successive movements are attained by locating one notch at a distance from the other about one-fourth the way round the wheel, as shown in the drawings. Each gate has a counter-weight, K, upon its short end, which weight will preferably be adjustably secured on the arm.

The mechanism employed for steadying the movement of the clock mechanism consists in the present instance of a fan, L, on a rotary spindle, l, having a pinion, l', gearing with a pinion upon a spindle, l^2, carrying a second pinion, l^3, meshing with a gear, l^4, upon the rotary spindle carrying the wheel, which serves to actuate the alarm-signal hereinbefore described.

Of course the above mechanism for steadying the motion of the apparatus could be considerably varied, since various regulating devices employed in clock mechanism could be adopted.

M indicates ordinary telegraph-poles, located at proper intervals along the road, for supporting the conducting-wires M', the said lines of wires being thus carried along the road to the standards N, located at suitable distances from the crossing as found desirable. For instance, where the travel over the road is rapid, the standards N will be set at some distance from the crossing, in order to cause the gates to close sooner. In each standard N is a tappet or push-button, which constitutes the circuit maker and breaker. These push-buttons have their heads normally projected out from the standards toward the track by means of springs n, located within recesses in the standard, and arranged to act against collars n' upon the pins or shanks of the push-buttons. One of the line-wires is at all times in electrical connection with the push-button, while the other line-wire in the circuit is in connection with springs n^2, secured to the standards, and located so that when the push-buttons are forced back the latter shall come in contact with the springs and cause the magnets to attract the armature, so as to release the vibratory arm from wheel E, thereby allowing the mechanism to start, so as to operate the alarm and gates. The magnets are located in the circuit in any suitable way, the arrangement of the circuit herein shown being as follows: Say the circuit begins at one of the posts indicated by No. 1, traverses wire 2 to coils of magnets, from coils to battery, from battery to wire 3, back to post 1; on opposite side of the track from post 4 through wire 5, across the road through wire 6, from this through wire 2, through the coils of magnets to battery, from battery, through wire 3,

back to the other side of the track, through wires 7 and 8, back to post 4. It will be understood that the other set of wires are in circuit of duplicate arrangement.

The locomotive is provided with means suitable for striking the push-buttons as the train approaches or leaves the crossing. That herein shown consists of a swinging knocker or bail P, hinged upon the cab, and adapted to be either swung out from the same or swung back upon the roof. This bail or knocker is placed under the control of the engineer by means of a lever, P′, pivoted to the bail or knocker and passed down through the roof of the cab, so that it can be conveniently grasped by the engineer. If, now, the train is approaching the crossing, and the knocker swung out, it will strike one of the push-buttons. The circuit will then be established through the magnets, the vibratory arm released from the wheel E, and the bell sounded, so as to give notice of the approach of the train. After the bell has sounded the required number of times, the gates will be caused to descend, and as soon as closed the finger on the vibratory arm will drop into the second notch of wheel E, thus checking the operation of the mechanism.

In lieu of the push-buttons, the device illustrated in Figs. 11 and 12 can be arranged in the track, below the level of the same, and provided with an oscillatory tappet or knocker-arm, R, projecting above the track in position to be struck by the cow-catcher of the engine. This circuit make and break mechanism consists of the said tappet or knocker-arm R, fixed upon a rock-shaft, R′, carrying a counter-weight, *r*, which tends to maintain the tappet in an upright position. This rock-shaft carries a pinion, S, and a segment, T, the said pinion being arranged to gear with a lower pinion, *t*, upon a spindle, U, which is also provided with a segment, U′, and a counter-weight, V. In this instance the line-wires are brought down, and connect with the metal plates W, located alongside of the segments, so that when the tappet or knocker is pushed down in either direction by the cow-catcher the segments will come into contact with the plates W, and the circuit be established.

From the foregoing it will be seen that the bell will commence to ring before the gates begin to close, thereby giving timely warning to persons on or near the track that the gates are about to drop; also, the flag or lantern will be vibrated, so that it can be seen by the engineer, and thus notify him that the apparatus is in working order. It will also, when lighted, be readily seen at night by persons along the road, so that deaf persons will be notified of the approach of the train.

It will also be observed that the operative parts of my mechanism are above ground, and hence cannot become impaired by water freezing about the same in winter, as is the case with apparatus located under ground.

The mechanism which I have described can with but little variation be employed for private residences—as, for instance, the tappet or knocker can be arranged in position to be pushed by a person in a carriage approaching the house. In this use jointed panels could be attached to the bar constituting the gate, so that as the gate-bar is raised the panels will close, somewhat upon the principle of a lazy-tongs.

Having thus described my invention, what I claim is—

1. A railway-gate and signal mechanism comprising a swinging gate, with mechanism, substantially as described, for storing power and turning the spindle on which the gate is mounted, an elevated vibratory support carrying a bell or equivalent signal device, connecting mechanism extending down from the vibratory-signal support to the gate-actuating mechanism, and an electrical circuit in which the circuit make and break is located so as to be actuated by an engine or train passing along the road, said members being organized for operation substantially as set forth.

2. The combination, with the gates located at opposite sides of the road, of devices, substantially as described, for turning the spindle upon which one of said gates is mounted, the connecting devices between the gates carried above and across the road, and an electrical circuit in which the circuit make and break is located so as to be actuated by the engine or train passing along the road, and means for automatically releasing the gate and signal-operating devices when the circuit is established, as set forth.

3. The combination of a clock mechanism with the notched gear-wheel E, devices, substantially as described, actuated by said wheel for operating the signal-bell, a segmental gear carried by wheel E, and devices, substantially as described, actuated by the segmental gear for raising and lowering the gates, substantially as described.

4. The combination, in a railway-signal apparatus, of a clock mechanism with the notched gear-wheel E, carrying a segmental gear, the vibratory arm adapted to engage in the notches of said wheel, the armature for the electro-magnets fixed upon the rock-shaft carrying said vibratory arm, and devices actuated by the notched gear-wheel and its segmental gear for raising and lowering the gates and ringing the bell, substantially as described.

5. The combination, in a railway-gate and signal apparatus, of the gates located at opposite sides of the road, devices, substantially as described, for turning the spindle upon which one of said gates is mounted, and the connecting devices between said gates carried above and across the road, as and for the purpose described.

6. The combination, with the clock mechanism and means, substantially as described, for releasing and stopping the same, of an elevated bell provided with an arm for carrying a flag or lantern, the elevated vibratory lever for vibrating the bell, a vertical connecting-rod

which actuates the vibratory lever, and a wheel which is impelled by the clock mechanism, and which in turn operates the said connecting-rod, substantially as set forth.

7. The combination, in a railway-gate and signal mechanism, of the gear-wheel E, provided with a supplemental segmental gear, the pinion E′, engaged by said gear-wheel, the wheel E^2 upon the spindle of said pinion, the pitman F^3, eccentrically connected with this last specified wheel for operating the bell, and the devices, substantially as described, actuated at intervals by the segmental gear upon the gear-wheel E, said devices being so timed that when the gear-wheel is started the bell shall commence to ring before the gate is operated, and also that the segmental gear shall cause the gate to both rise and fall at the proper moments, substantially as described.

8. The combination, in a railway-gate and signal mechanism, of the notched gear-wheel E, provided with a supplemental gear, devices, substantially as described, actuated by said segmental gear for operating the gates, the arm H, normally held against the gear-wheel and engaging in one of its notches, the armature of the magnets, which, when attracted thereby, releases the arm from the gear-wheel, the notches in said gear-wheel being located so that the same shall be stopped by the vibratory arm at the moments herein specified.

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

CHARLES F. STRACK.

Witnesses:
A. M. BRACKENRIDGE,
J. A. RUTHERFORD.