(No Model.) 2 Sheets—Sheet 1.

R. O'TOOLE.

RAILROAD CROSSING SIGNAL.

No. 556,553. Patented Mar. 17, 1896.

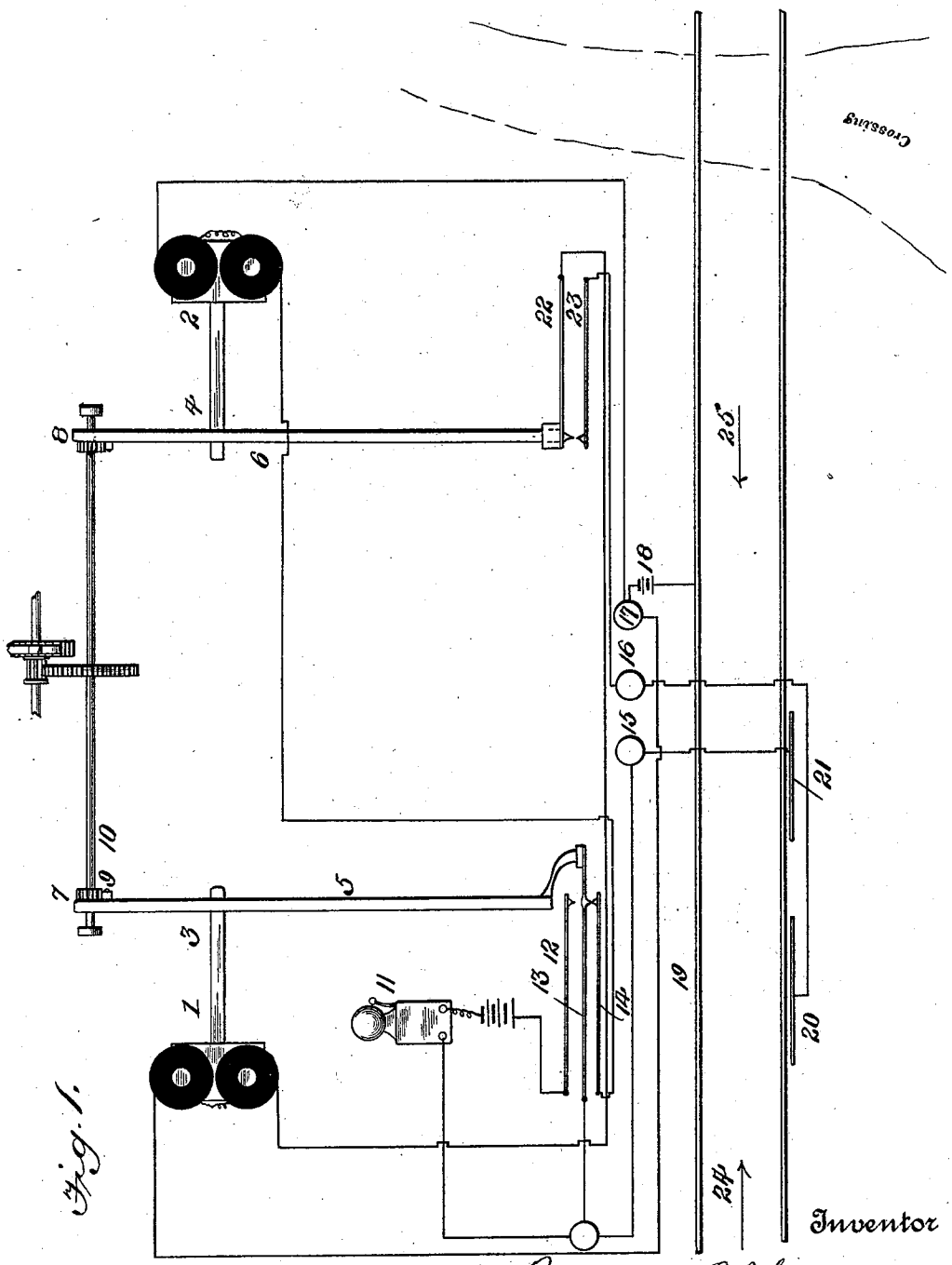

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

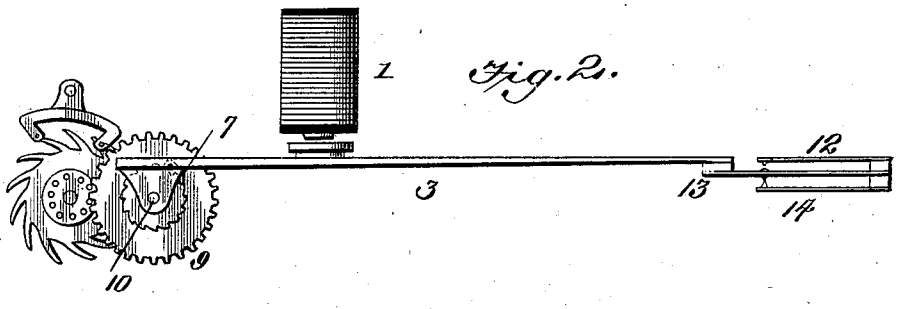


Fig. 3.

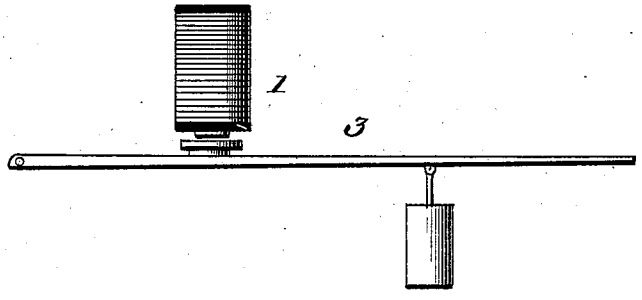
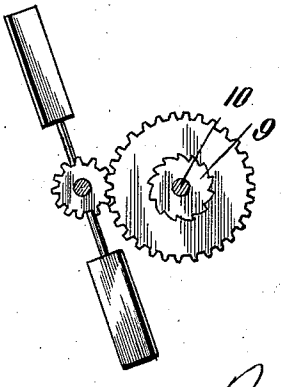


Fig. 4.



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UNITED STATES PATENT OFFICE.

RICHARD O'TOOLE, OF THURMONT, MARYLAND.

RAILROAD-CROSSING SIGNAL.

SPECIFICATION forming part of Letters Patent No. 556,553, dated March 17, 1896.

Application filed February 20, 1895. Renewed February 15, 1896. Serial No. 579,462. (No model.)

To all whom it may concern:

Be it known that I, RICHARD O'TOOLE, a citizen of the United States, and a resident of Thurmont, in the county of Frederick and State of Maryland, have invented certain new and useful Improvements in Railroad-Crossing Signals, of which the following is a specification.

My invention relates to an electrical signaling apparatus designed for railroad-crossings. It is so constructed that a signal will be given when the train is approaching the crossing, but not when it is passing away from the crossing. On a double-track railroad at a crossing the apparatus may be used and arranged only for a direct signal when approaching a crossing, but on a single-track railroad the apparatus must be so constructed that it will give a signal only when the train is approaching the crossing and the signal will be so operated as to be silent when the train is passing away from the crossing.

In the drawings, Figure 1 is a diagrammatic view of my railroad-crossing signal, showing the wire connections and the track and a convenient form of circuit-closing and signal apparatus. Fig. 2 is a side elevation of the apparatus which I prefer to use by which the circuits are closed and opened. Fig. 3 is a modification showing the arrangement of a dash-pot above the armature-lever to control the motion of the contact making and breaking levers which carry weights. Fig. 4 is a modified form of device for controlling the motion of the circuit-closing lever.

1 and 2 are two electromagnets having armatures and levers 3 and 4.

5 and 6 are two levers pivoted on a bar at 7 and 8 and each provided with a ratchet-wheel, such as 9, and a pawl. The ratchet-wheel is fast on the shaft 10. When the magnets are attracted the levers 3 and 4 throw out the the levers 5 and 6, their pawls engage the ratchets 9 and a similar one for the lever 6 and maintain the levers in an elevated position. On the shaft 10 and connected with it is also arranged an escapement apparatus or fan, or dash-pot which controls the motion of the shaft 10 and causes the levers 5 and 6 when once raised to descend slowly. Other devices to accomplish this result may be employed.

11 is a bell having local battery and having contact-points 12 and 13 in its circuit which are normally closed when the lever 5 is up. The down position of the lever 5 is its normal position. Hence when the lever 5 is normally down the bell-circuit will be broken.

14 is a third contact-lever which makes contact with the contact-bar 13 and normally maintains a closed circuit when the lever 5 is down.

15, 16 and 17 are binding-posts.

18 is a battery.

19 is a track connected to the battery 18 at one side.

20 and 21 are track-bars, both on the same side of the track, one connected to the post 16 and the other to the post 15. The post 15 is also connected with the contact-point 13.

22 and 23 are two contact-points upon which rests the end of the lever 6 in its normal position and maintains them in contact.

The circuits are as follows: The track 19 is connected to the battery 18 and the battery 18 to the binding-post 17. To the binding-post 17 there are two other wires, one leading to the magnet 1 and the other to the magnet 2. The return wire from magnet 1 is connected to the contact-point 22, and the return wire from the magnet 2 is connected to the contact-lever 14. The post 15 has two wires, one connected to the track-bar 21 and the other to the contact 13. The binding-post 16 has two wires, one connected to the track-bar 20, the other to the contact 23.

The operation of the device is as follows: A train moving in the direction of the arrow 24 will close the circuit between the track-bar 20 and the track 19, the current will flow to the post 16, to the contact 23, to the contact 22, to the magnet 1, to the post 17, the battery 18, the track 19, energizing the magnet 1, attracting its armature, throwing up the lever 3 and the lever 5, which will be caught by the ratchet 9 and held up by the escapement. The contact-finger 13 will rise when released by the lever 5, make contact with the finger 12, at the same time breaking the circuit between 13 and 14. The contact between 12 and 13 will close the bell-circuit and ring the bell for the crossing which is approached. After passing the track-bar 20 the train will run on to the track-bar 21 and close the circuit be-

tween it and the track 19. The circuit will then be between the track-bar 21 and the post 15, thence to the finger 13, but the circuit between 13 and 14 being open, no action of magnet 2 will occur. This will continue with each wheel of the train and the signal will be continued to be given when the train is approaching the crossing and for a specified period after the train has left the track-bars. When the train is approaching in an opposite direction—that is to say, in that of the arrow 25—the train will first make contact with the track-bar 21 and the track 19. Current will flow from track-bar 21 to post 15, thence to finger 13, thence to contact 14, thence to magnet 2, thence to post 17, thence to battery 18, thence to track 19, completing the circuit. The armature 2 will be attracted, lever 4 thrown up, lever 6 thrown up, the latter will be caught by the ratchet and held up by the escapement, contacts 22 and 23 will be separated and held out of contact by their own elasticity, so long as the lever 6 is maintained by its escapement in an elevated position. This breaking of the circuit of magnet 1 will prevent the closing of the bell-circuit when the train runs onto track-bar 20 and the signal will be silent.

One of the desired features of this invention consists of providing the armatures, armature-levers or any one of the levers connected to and actuated by the armatures with some device for controlling their motion, so as to cause the levers 5 and 6 to descend slowly when raised. This may be done by using an escapement, a dash-pot, a fan, or other device connected to any one of those levers.

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

1. In a railroad-crossing signal the combination of a track and a pair of track-bars located beside said track one in front of the other, with a pair of electromagnets and a pair of circuit-closers, said circuit-closers being so constructed as to open except when closed by a weight, mechanism connecting the armatures of the magnets with the weights of the circuit-closers for lifting the said weights when the magnets are energized, and means for automatically suspending said weights during a specified period after having been raised.

2. In a railroad-crossing signal the combination of two actuating devices one located on each side of the crossing and a bell at the crossing, each actuating device being in circuit with a bell-ringing device, each actuating device consisting of two track-bars and one track, said track-bars being arranged one in front of the other and each track-bar and the track forming part of an independent circuit, two electromagnets one included in each of the circuits of the track-bar and track, and a pair of circuit-closers one included in each of the circuits, and mechanism operated by the electromagnets to open and close the circuit-closers.

3. In a railroad-crossing signal the combination of two actuating devices one located on each side of a crossing and a bell at the crossing, each actuating device consisting of two track-bars and a track each included in a separate circuit, each of said circuits including an electromagnet and an independent circuit-closer, each circuit-closer operated by the electromagnet not in its circuit, with an independent local circuit including a bell at the crossing, and a circuit-closer therein operated by one of the actuating circuit-closers to close the local circuit and ring the bell, substantially as described.

4. In a railroad-crossing signal the combination of a railroad-crossing signaling-bell and local circuit including a local circuit-closer, with an actuating device located at a desired distance from the crossing consisting of two track-bars, two circuits each including one track-bar and a track, also an electromagnet and circuit-closer, one of said circuit-closers controlling the bell-circuit closer, each of the actuating device circuit-closers being so constructed as to open except when mechanically closed, and means actuated by the electromagnets for opening the circuit-closers.

5. In a railroad-crossing signal the combination of a railroad-crossing signaling-bell and local circuit including a local circuit-closer with an actuating device located at a desired distance from the crossing consisting of two track-bars, two circuits each including one track-bar and a track, also an electromagnet and circuit-closer, one of said circuit-closers controlling the bell-circuit closer, one of the actuating device circuit-closers being held normally closed by a weight connected to a lever operated by the electromagnet not in its circuit, and means for sustaining said weight for a predetermined time when raised so as to keep the circuit of the bell-operating circuit-closer open until the train shall have passed both track-bars.

6. In a railroad-crossing signal the combination of a bell at the crossing, local circuit and circuit-closer therefor, an actuating device on each side of the crossing at a desired distance therefrom, each actuating device consisting of a track and two track-bars, each track-bar included in an independent circuit with the track, each of said circuits including an electromagnet and a circuit-closer, the circuit-closers operated by the magnets to close the bell-circuit or leave it open according as one or the other of said circuit-closers is first actuated.

7. In a railroad-crossing signal the combination of a bell at a crossing, a local circuit and circuit-closer therein, with an actuating device located at a desired distance from the crossing consisting of two track-bars and a track, each track-bar included in an independent circuit with the track, each independ-

ent circuit including an electromagnet and a circuit-closer operated by the magnet not in its circuit, the circuit-closer which is in circuit with the track-bar farthest removed from the crossing operating the local bell-circuit closer.

8. In a railroad-crossing signal the combination of an actuating device consisting of two track-bars and a track, the track-bar farthest removed from the crossing and the track, in an independent circuit and including a circuit-closer and an electromagnet, said magnet operating to close the local circuit-closer and ring the bell, the second track-bar and track being in an independent circuit and including a circuit-closer and an electromagnet, said electromagnet operating to open the first circuit-closer and break the circuit of the first magnet, substantially as described.

Signed at Baltimore, in the State of Maryland, this 26th day of January, A. D. 1895.

RICHARD O'TOOLE.

Witnesses:
JOHN L. HEBB,
GEO. W. SMITH.