

(No Model.)

2 Sheets—Sheet 1.

J. WAYLAND.

ELECTRICALLY CONTROLLED RAILWAY SIGNAL.

No. 512,077.

Patented Jan. 2, 1894.

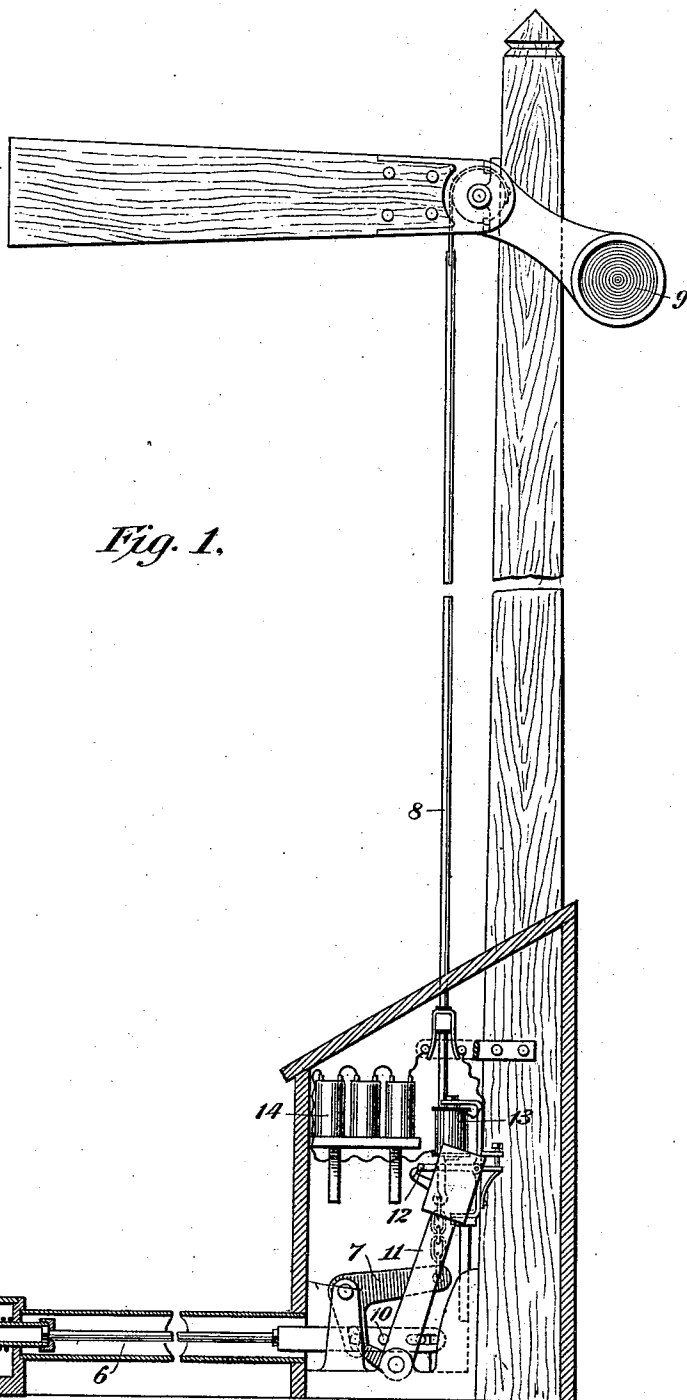


Fig. 1.

Witnesses
C. E. Ashley
John P. Nordstrom

Inventor
James Wayland
By his Attorneys
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(No Model.)

2 Sheets—Sheet 2.

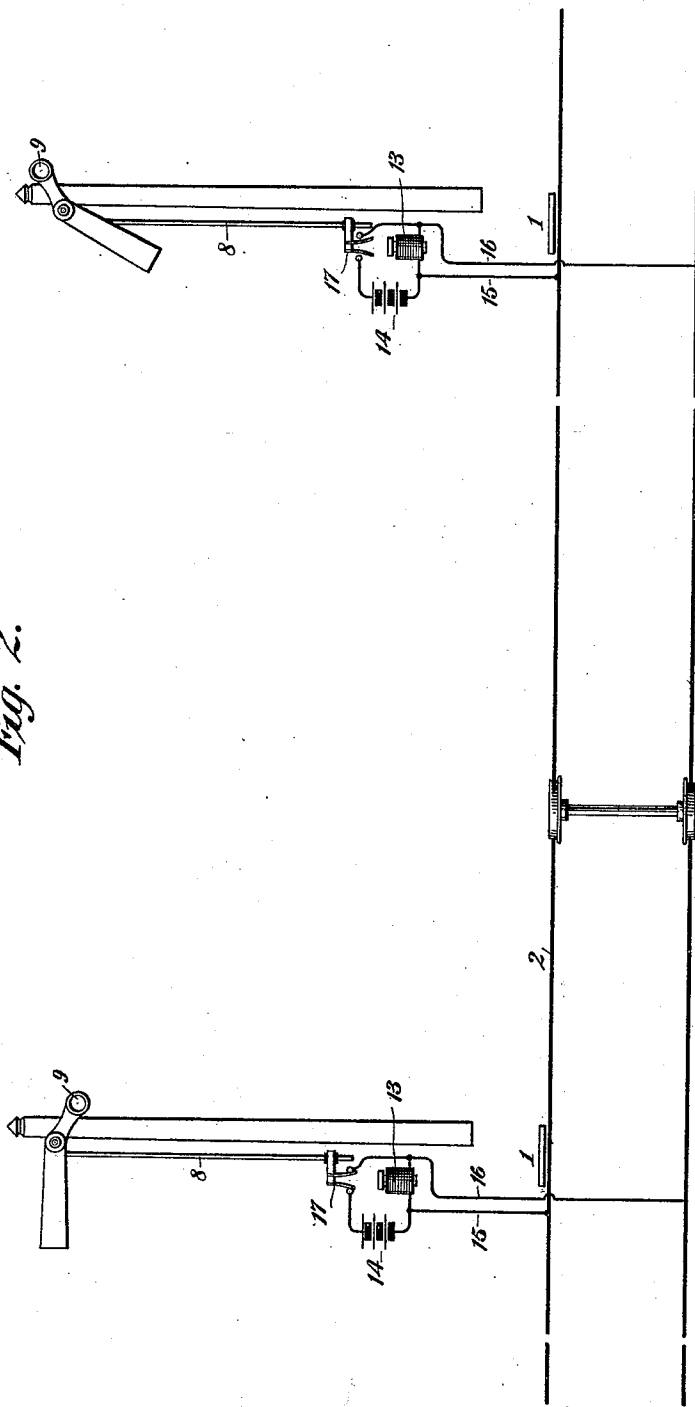
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Fig. 2.



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By his Attorneys
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UNITED STATES PATENT OFFICE.

JAMES WAYLAND, OF NEWARK, NEW JERSEY.

ELECTRICALLY-CONTROLLED RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 512,077, dated January 2, 1894.

Application filed October 5, 1893. Serial No. 487,289. (No model.)

To all whom it may concern:

Be it known that I, JAMES WAYLAND, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Electrically-Controlled Railway-Signals, of which the following is a specification.

This invention relates to electrically controlled railway signals, the object being to simplify and cheapen the construction and insure the safety of operation of such devices.

The invention comprises one or more signals set adjacent to a railway track and provided with means for setting them, and a releasing electro-magnet controlled by a circuit-closer actuated by the signal mechanism, and by a short-circuit normally open at the track rails, which, when completed by the presence of a train, renders the magnet inoperative to release the signal, but when the short-circuit is opened by the exit of a train out of a section energizes the electro-magnet and restores the signal to a position of safety.

In an application filed by Frank McBrien, Serial No. 486,419, on or about the 25th day of September, 1893, was described a similar system, in which a releasing electro-magnet was dependent upon the operation of two circuit-closing devices, one actuated by the signal, and the other by a relay. My invention is designed as a simplification of the apparatus described in said application, by rendering the system operative by a single circuit-closer controlled by the signal.

In carrying out the invention a signal device will be located preferably at one end of each protected section or district of the railway, and where a number of signals are used a line of way will be divided into a plurality of sections of suitable length, and a signal placed at a suitable point in each section. The signal may be set in any desired manner, but will preferably be automatically set to a "danger" position by a train entering the protected district, and will remain set until the entire train shall have passed out of said district. The successive rails of each section will preferably be bonded at their joints by good conductors so as to make of each entire section a good electrical conductor. So long

as any pair of wheels of a train remains in the section the short-circuit around the releasing magnet will be completed through the axle of the car, but when the section is cleared this short-circuit will be opened and current will be diverted through the releasing magnet, restoring the signal.

The preferred form of signal-setting device is that described in a patent issued to me, No. 492,598, dated February 28, 1893.

The several features of novelty of the invention will be more particularly hereinafter explained, and will be definitely indicated in the claims appended to this specification.

In the accompanying drawings which illustrate the invention, Figure 1 is a sectional view, partly in elevation, of a signal embodying my improvements, and Fig. 2 is a diagram showing the circuit connections of two such signals located upon two successive sections of a railway track.

The system will be best understood after a brief description of my mechanically set signal described in the patent hereinabove referred to, and which, as seen in Fig. 1 of the drawings, comprises a pivoted tread-lever 1 placed at the side of a rail 2 and provided with an inclined shoulder 3, which forces laterally a pivoted arm 4 against the tension of a stout spring 5, when the tread-lever is depressed by the weight of a passing train. The arm 4 is provided with a beveled shoulder provided with a co-operating shoulder 3 on the tread-lever 1, so that when the latter is depressed the lever is forced laterally against the tension of the spring 5 and locked by the shoulder 3 in such position. A sliding connection is formed between a rod or tube inclosed by the spring, and a headed rod 6 pivotally connected with a bell-crank lever 7 mounted on a suitable bearing at the base of the signal post. One end of the bell-crank lever is flexibly connected with a vertical rod 8 connected at its upper end with a semaphore provided with a counter-balance 9. A stud bolt 10 is provided on an extension of the rod 6 and co-operates with a hooked extension of a weighted lever 11, which is provided with a latch engaging a detent on an armature 12 of a restoring electro-magnet 13. From this construction it will be seen that when the tread-lever 1 is depressed by a pass-

ing train, spring 5 will be compressed and locked in its compressed condition, the sliding connection between the tube inclosed by the spring and the rod 6 permitting this to occur 5 instantaneously under the weight of the engine. The rod 6 will then be free to be shifted laterally by the bell-crank lever 7, under the influence of the counter-balance 9 of the semaphore, and the semaphore will rise to a 10 "danger" position, where it will remain until the electro-magnet 12 is energized, when the weighted lever 11 will be unlatched and, dropping, its hooked extension near the pivot will strike stud-bolt 10 and shift the lever 6 sufficiently far to permit the spring-pressed tread- 15 lever 1 to rise, thus releasing the spring 5 and permitting it to exert a sudden thrust upon the weighted lever 11 and again lift it to or a little beyond the position shown in the drawings, where it will again be latched because 20 the releasing action which energized the magnet 13 was only momentary. Simultaneously the rod 6 acted upon by the spring 5, pulls on bell-crank lever 7 and draws down the semaphore and lifts its counter-weight. 25

In order that the releasing magnet shall not be energized and the signal restored until the last car of the train shall have passed out of the protected section, I provide around said 30 releasing magnet a normally open short-circuit by connecting the rails of conductors 15, 16. A battery 14 for supplying current to the electro-magnet is located at the signal post, and a circuit-closer 17 is attached to some 35 part of the signal-setting mechanism, preferably the rod 8, as indicated, so that it is impossible for the magnet to be energized except when the signal is set. Several important results follow from the use of this circuit-closer, one of which is that the weighted 40 lever 11 is always maintained in a position ready for action, since the instant the lever is released the dropping of the rod 8 opens the circuit-closer 17 and permits the armature 12 to drop off in a position to hook the lever on its rebound. Another important result is that it becomes impossible for any person to maliciously set the signal to a "dan- 45 ger" position, for if by a surreptitious operation of the track lever 1 the semaphore is raised, the releasing magnet is energized the moment the circuit-closer 17 completes the circuit, thus lifting the armature 12 and permitting the semaphore to drop back to 50 "safety" position, thereby opening the circuit-closer 17 and insuring the latching of the lever 11, as already adverted to. The conductors 15, 16 are led directly to the rails at the signal station and so connected with the 60 circuit of battery 14 that the releasing magnet will be short-circuited as long as a pair of wheels remains in the section. It will thus

be seen that insulated track wires, such as are common in railway signals are not required, and that all the controlling apparatus 65 may be centralized at the signal station. It will therefore be understood that when a train enters the section, the short-circuit by way of conductors 15, 16 is completed, and the track instrument 1 then operated, setting 70 the signal in the manner already described, which will remain set because the releasing magnet is short-circuited, and the lever 11 is therefore latched by its armature; but after the section is cleared the short-circuit is 75 opened and current diverted through the releasing electro-magnet, unlatching the lever 11 and restoring the signal to "safety." The only requirement to insure the safety of operation of the apparatus is that the resistance 80 of the releasing magnet shall bear such a relation to the resistance of the rails that it will draw insufficient current to operate the releasing mechanism while the short-circuit by way of conductors 15, 16 is completed, a con- 85 dition very easily satisfied.

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

1. A railway signaling system comprising one or more blocks or sections, a signal for each block automatically set by a passing train, a circuit-controller operated by the signal mechanism, a releasing magnet in the circuit controlled thereby, and circuit connections from the sides of the releasing magnet 90 to the track rails. 95

2. A railway signaling system comprising one or more blocks or sections, a signal for each block automatically set by a passing train, a releasing magnet, a circuit-closer operated by the signal mechanism to close a circuit through the releasing magnet, and a normally open short-circuit around the releasing magnet including the track rails. 100 105

3. A railway signaling system comprising one or more blocks or sections, means for automatically setting a signal to indicate the presence of a train, a circuit controller actuated by the signal mechanism, a releasing magnet for unlocking the signal after being set, said releasing magnet being in circuit with the circuit controller, and a track branch of the same circuit controlled by a train upon entirely leaving the section to energize the circuit containing the releasing magnet and the circuit controller. 110 115

In testimony whereof I have hereunto subscribed my name this 2d day of October, A. D. 1893.

JAMES WAYLAND.

Witnesses:

ROBT. H. READ,
E. C. GRIGG.