

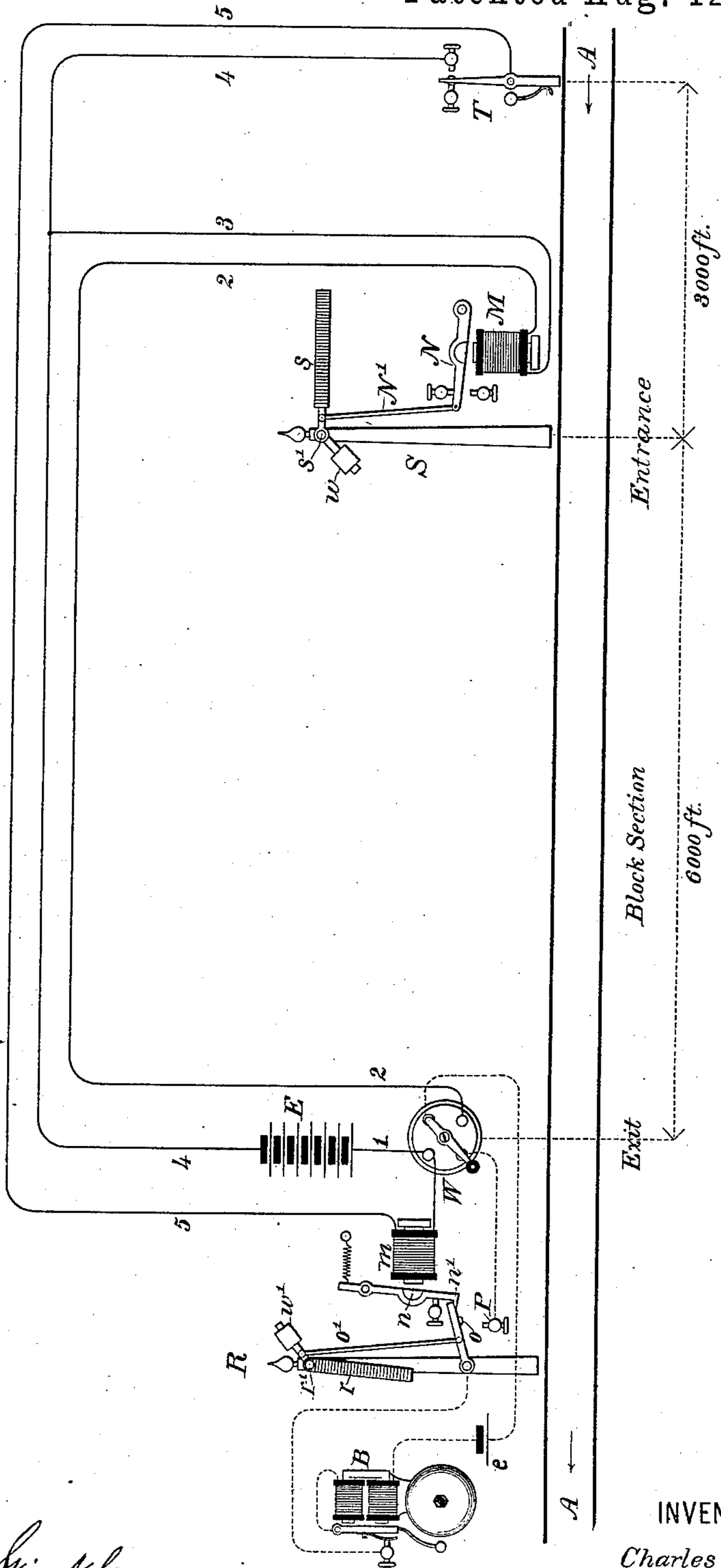
(No Model.)

C. A. SCOTT.

SIGNALING APPARATUS FOR RAILROADS.

No. 303,595.

Patented Aug. 12, 1884.



WITNESSES

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SIGNALING APPARATUS FOR RAILROADS.

SPECIFICATION forming part of Letters Patent No. 303,595, dated August 12, 1884.

Application filed November 13, 1883. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. SCOTT, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Signaling Apparatus for railroads, of which the following is a specification.

My invention relates to a system of signals for regulating or directing the movements of trains along the line of a railway or of any desired portion thereof, which is commonly called the "block" or "space" system; and it consists generally in placing at the entrance of each block or section of the railway to be protected a visual or semaphoric signal, which normally remains in a position indicating "danger" or "line blocked," by the action of gravity or other constant force, which signal may, however, be "cleared," as it is technically termed—that is to say, placed in a position to indicate that the block or section is clear of obstruction, by means of a suitable device placed at the exit of the block and connected with the signal, so that the latter may be operated by a signalman stationed at that point.

The principle of my invention contemplates that the indications of the signal at the entrance of the section, which regulate the admission of trains thereto, shall be wholly controlled by a single signalman stationed at the exit of the section or block. To admit of this being done, it is necessary that the signalman shall be automatically notified of the approach of a train to the entrance of the section while it is still a considerable distance therefrom. I effect this by placing at a suitable point sufficiently far in advance of the entrance-signal a suitable signal-transmitting device, adapted to be automatically actuated by the approaching train, which actuates a signal, either visual or audible, or both, in the cabin of the signalman at the exit of the section. This last-mentioned signal, after having been exhibited or set in action by the approaching train, will continue in sight or in action, as the case may be, until the signalman has cleared the entrance-signal, and placed it in a position to admit the train to the section. This system of signaling is applicable to all points upon a railway at

which special protection is needed—such as stations, junctions, grade-crossings, draw-bridges, &c.—the point to be so protected being in all cases placed at the exit of the block-section where the signalman is stationed, the latter being thus enabled to control the approach of trains while yet at a safe distance from the point to be protected.

The accompanying drawing is a diagram illustrating a suitable form of apparatus for carrying out my invention, in which A A represent a portion of a line of railway on which trains pass in one direction only, as indicated by the arrows. The portion of the track included within the block or section to be protected may conveniently be about six thousand (6,000) feet in length, as indicated by the dotted lines, but may be more or less in any case, as circumstances require.

At the entrance of the block-section is placed a semaphoric or visual signal, S, which may be of any suitable construction, the only condition necessary being that it shall normally remain in a position to indicate "danger" or "line blocked" to an approaching train, and shall be capable of being "cleared" or set to indicate "safety" by the signalman at the opposite or exit end of the block-section. In case the distance is not too great, this signal may be actuated mechanically by a wire rod or cord in a well-known manner; but in most cases it is deemed preferable to either actuate it directly by electro-magnetism, or indirectly by means of a sufficient force stored up and controlled by electro-magnetism.

I have shown in the diagram a simple form of visual signal which will sufficiently serve to illustrate the principle of operation, consisting of a semaphore-arm, s, which is pivoted at s' to a stationary upright, and is overbalanced by a weight, w, tending to raise it into a horizontal position indicating "danger" or "line-blocked," as shown in the figure, and also to retain it in such position, but which may be depressed and made to assume a vertical or inclined position signifying "safety" or "line clear," in consequence of the elevation of the weight w by the attractive force of the electro-magnet M exerted through its armature-lever N and a connecting-rod, N'.

At the exit of the block-section I have shown

a hand-switch or electric circuit-closer, W, which may be moved at will into such a position as to form a connection between the electric conductors 1 and 2, whereby an electric current from the battery E is caused to traverse the wires 1 and 2, electro-magnet M, and wires 3 and 4. Hence, by means of the switch W, or other equivalent device, the signalman at the exit of the block can "clear" the signal S at the entrance of the block and admit an approaching train at pleasure.

As the entrance of the block-section will in most cases be situated at a considerable distance from the exit, and therefore wholly out of sight of the signalman, it is essential to provide some means whereby he may be notified of the approach of a train to the entrance-signal, so that in case the track is clear he may at once clear the signal, or place it in a position denoting "safety," thus permitting the train to enter the block without stopping or even slackening its speed. I effect this by placing at a point a considerable distance in advance of the entrance of the section, say, about three thousand (3,000) feet, a signal-transmitting device, T, which is adapted to be automatically actuated by the train itself.

In the drawing I have shown a track-circuit closer, which may be of any suitable or well-known construction, being so arranged that the approaching train, by its weight or impact, serves to close a circuit by forming a connection between the electric conductors 4 and 5. This completes the circuit of the battery E through the conductors 1, 4, and 5 and electro-magnet *m*. I prefer to actuate, by means of this signal-transmitter, both a visual and an audible signal at the exit of the block-section, for the purpose of notifying the signalman of the approach of a train. Any convenient form of signals may be employed for this purpose. I have shown a miniature semaphore signal, R, consisting of an arm, *r*, pivoted at *r'* to an upright support, and overbalanced with a weight, *w'*. A pivoted arm, *o*, is mechanically connected with the signal-arm by a rod, *o'*. When the weight *w'* is raised and the signal-arm *r* depressed, the end of the arm *o* is caught upon a latch or detent, *n'*, at the end of the armature-lever *n* of the electro-magnet *m*. Hence, when the circuit is closed at T by an approaching train, the electro-magnet *m* attracts its armature *n* and withdraws the detent *n'*, thus permitting the weight *w'* to descend and raise the miniature semaphore-arm *r* to a horizontal position. At the same time the arm *o* comes in contact with the stop *p*, thus completing the circuit of a local battery, *e*, (indicated by dotted lines,) which passes through the switch W and includes the electro-magnet of the vibrating alarm-bell B. Hence the closing of the circuit at the signal-transmitter T not only exhibits a visual signal by means of the miniature signal-arm *r*, but also sets the alarm B in operation, thus orally calling the attention of the signalman

to the approach of the train. If, upon receiving this signal, the signalman finds that the track within the block-section is obstructed—as by the presence of a preceding or of a crossing train, the displacement of a switch or draw-bridge, or other like cause—he permits the signal S at the entrance of the block-section to remain in its normal or horizontal position, indicating "danger" or "line blocked," until the obstruction is removed.

The switch W or other device for closing the signal S may with advantage be fitted with a retracting spring or weight, W', which normally tends to retain it in the position shown in the figure—that is to say, one in which the wires 1 and 2 will be disconnected. This will render it necessary for the signalman to hold the device in position while the train is entering the block-section, until he becomes aware, either by seeing or hearing the approaching train, or by a signal transmitted from the entrance by any convenient means, that the train has entered upon the block, when he will release the switch W, whereupon the electric circuit will be broken by the action of the spring or weight W', and the semaphore-arm *s* will resume its horizontal position, thus protecting the rear of the train after it has entered the section.

I do not desire to confine myself to the particular instrumentalities which I have herein shown and described for carrying out my invention. The essential object of the invention is to place the control of the admission of trains to a block-section in the hands of a single signalman stationed at the exit of such section by means of an entrance-signal normally indicating that the line is blocked, which may be cleared by the signalman, in combination with a device for notifying him of the approach of a train before it reaches the point of entrance.

I claim as my invention—

The combination of a section of railway-track, a visual signal situated at the entrance of said section, which normally indicates "line blocked," by the action of a constant force, a device connected with said entrance-signal and situated at or near the exit of said section, whereby said signal may be cleared, a circuit-controlling device so constructed and situated as to be automatically actuated by an approaching train before said train reaches the vicinity of the entrance-signal, and an electric circuit extending from the signal-transmitting device to an electro-magnet for actuating an audible or visual signal at the exit of the section.

In testimony whereof I have hereunto subscribed my name this 8th day of November, A. D. 1883.

CHARLES A. SCOTT.

Witnesses:

J. HENRY TAYLOR,
JAMES F. BLIGH.