(No Model.)

2 Sheets—Sheet 1.

U. S. JACKSON.

RAILWAY SIGNAL.

No. 473,190. Patented Apr. 19, 1892.

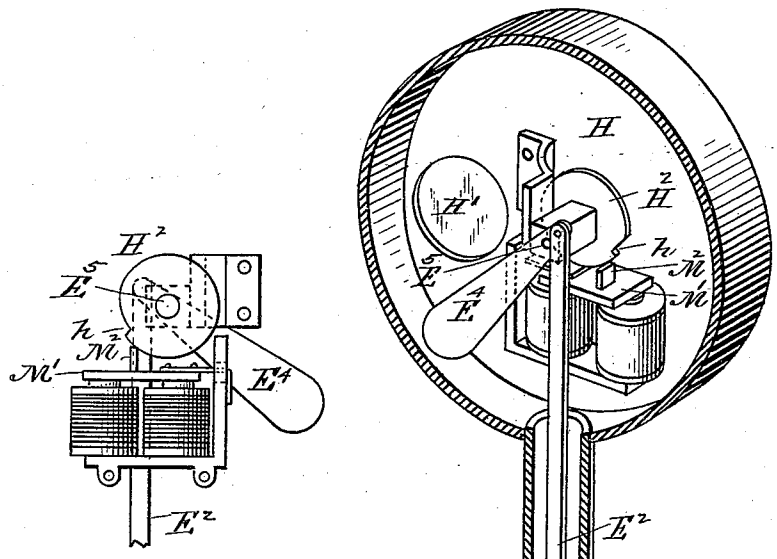

Fig. 2.

Fig. 1.

WITNESSES
Thomas J. Keefe.
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INVENTOR
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by Frank G. Parker Atty

(No Model.)

2 Sheets—Sheet 2.

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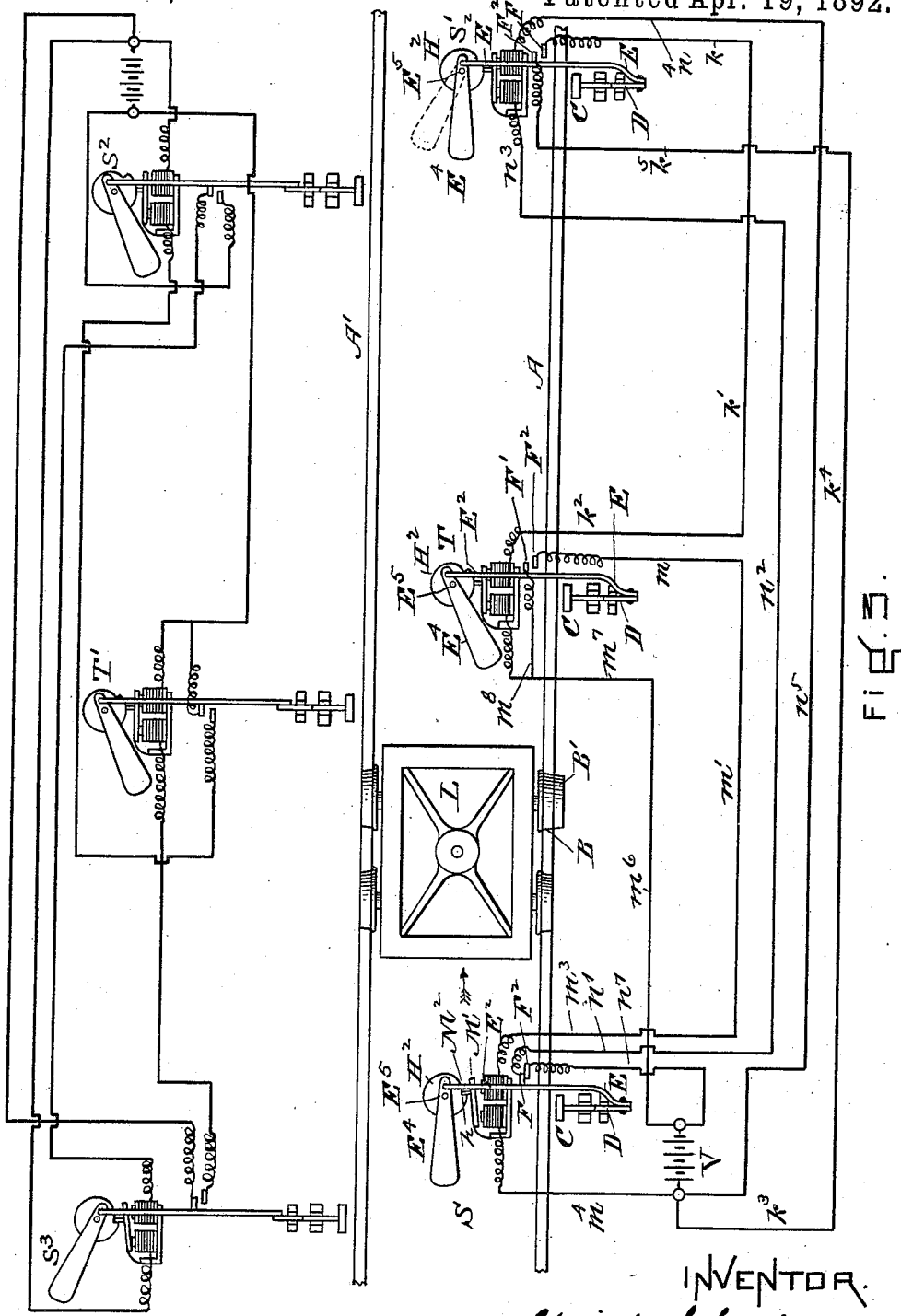

Fig. 5.

WITNESSES.

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Matthew M. Blunt.

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Uriah S. Jackson.

per Frank G. Parker

UNITED STATES PATENT OFFICE.

URIAH S. JACKSON, OF OSSIPEE, NEW HAMPSHIRE, ASSIGNOR TO THE JACKSON-CADY ELECTRIC RAILWAY SIGNAL COMPANY, OF PORTLAND, MAINE.

RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 473,190, dated April 19, 1892.

Application filed October 21, 1891. Serial No. 409,416. (No model.)

To all whom it may concern:

Be it known that I, URIAH S. JACKSON, of Ossipee, in the county of Carroll and State of New Hampshire, have invented certain new and useful Improvements in Railway-Signals, of which the following is a specification.

My invention relates to an improved system of railway-signals, the object being to simplify the arrangement by combining in a single system apparatus adapted to be operated mechanically and also electrically—that is, part of the work in the same system is done mechanically and a part electrically. This object I attain by the mechanism shown in the accompanying drawings, in which—

Figure 1 is a view in perspective showing parts of a railroad-track, a truck-wheel of peculiar construction, and one of the signal-boxes, together with the connecting parts. Fig. 2 is an elevation showing the parts more immediately connected with the signal proper. Fig. 3 is a diagrammatical plan showing a track, a single car, and a system of signals.

The system that I adopt is to indicate at one station that the train has left the next nearest station and is approaching. The train also sets mechanically block-signals at points intermediate between stopping-stations. These block-signals are set to stop any following train, and so remain until the first train has passed the next block-signal and set it mechanically at "Stop" and has electrically set the preceding signal "Open"—that is, a train leaving one station signals the next station that it has left that station, and as it proceeds, block by block, it sets mechanically the block-signal as it passes it and opens electrically the next preceding signal, thus allowing the next train to follow behind it at a distance of one block.

In this device, Fig. 1, A A′ represent a railroad-track, and B one truck-wheel, which may be on the engine or tender, or, in fact, on any part of the train. This truck-wheel has added to it an extension B′, there being one of these peculiarly-constructed wheels on each train. I have adopted this device for the purpose of avoiding the noise and unnecessary wearing action of the ordinary arrangement, in which every wheel of the whole train hits the operating-lever C and causes noise and unnecessary wear, as a single movement of this lever C is sufficient to set the signal. The lever C is pivoted at C^2, Fig. 1, and its rear end C′ is located beneath the front end of the lever D D′, pivoted at D^2. The rear end of the lever D D′ is connected by the link E E^2 to the signal-board E^4, so that as a train passes its signal-wheel B B′ will depress the lever C C′, and acting through the lever D D′ and link E E^2 throw up the sign E^4 in front of the opening H′—that is, it sets it at "Stop." The sign E^4 is held in position by the following device: H^2 is a notched disk attached to a shaft E^5, the said shaft being rigidly attached to the signal-board E^4 so that the disk H^2 always moves with the signal-board. To hold this disk H^2 and the signal-board E^4 in position, a notch *h* (see Figs. 1 and 2) is made in the disk and is adapted to engage with a pawl-piece M^2 on the armature M′, and as this armature M′ is thrown up by a spring (when the magnets M are not in circuit) then the said pawl-piece will, by engaging with the notch *h*, hold the signal-board E^4 up until the magnetic circuit is completed by the action of the train at the next station, as will be hereinafter described. Then the drawing down of the armature M′ will remove the pawl M^2 from the notch *h* and allow the signal-board E^4 to drop, thus opening that block.

As it would require a large amount of electrical energy to lift the signal-boards, I have so arranged the apparatus that the lifting of the signal-boards is always done by purely mechanical means, the power being supplied by the signal-wheel B B′ of the train.

In carrying out my system of signals I have some of them arranged to be raised above the horizontal line, as shown at S^3, Fig. 3, and in this case the electrical action drops the signal to the level, in which position it covers the opening H′ in the signal-head—that is, some of my signals are arranged to be dropped from above the opening H′ down to the level, and thus close the said opening, while other signals stand level, covering the opening H′, and are made to drop by electrical action below the level, and thus expose the opening H′.

To illustrate the mode of operation of my system, I will trace out by means of the diagram Fig. 3 the movement of a train and of

the signals. Let L represent a car of the train, having the signal-wheel B B′, and we assume that in leaving the station S its signal-wheel has acted through the levers C C′ and D D′ and link E E^2, so as to mechanically raise the signal-board E^4 to the position shown at the station S, Fig. 3. That position of the signal-board prevents any car from following the train. The car L in passing station S not only throws up the signal-board mechanically, as has just been described, but it makes an electrical connection between F and F^2. (See Fig. 1.) This electrical connection completes an electrical circuit like the ones indicated by F′ F^3, for instance, or may connect at the same time more than one electrical circuit, so as to change signals at different points at the same time. Now referring to the action of the car L in passing the station S, we see that, in addition to its mechanical work of setting its own signal-board, it (by causing F and F^2 to come in electrical contact with each other) completes an electrical circuit through wires n' n^2 n^3, magnets at station S′, wires n^4 n^5, battery V, and wire n^7 to F^2, thus dropping the signal-board S′ from its dotted position to the horizontal position, as shown. This action notifies station S′ that the car has left station S. Now as the car proceeds to pass the block-signal T it will throw up that signal-board mechanically and, closing F′ F^2, complete an electric circuit through the wires m m' m^3, magnets of station S, wire m^4, battery V, and wires m^6, m^7, and m^8. This completing of the circuit draws down the armature of the magnets at station S and allows the signal-board to drop, thus indicating that the track is clear between station S and the block-signal T. Now as the car L passes to station S′ it will throw up that signal mechanically to its elevated position, as indicated by dotted lines. At the same time an electrical connection is made between F and F^2, thus completing an electric circuit from F over wires k k' k^2, magnets at station T, wires m^7 m^6, battery V, and wires k^3 k^4 k^5 to F^2, and will drop the signal at T, so as to open the road between the block-signal T and the station S′. Now a further motion of the train would simply be a repetition of the movements already described.

In the above statement of the action of the train we have supposed it to act only upon the right-hand-side signals, (going in the direction of the arrow,) the left-hand signals not being acted upon. The returning train would act on the set of signals, as shown on the left or upper side of the diagram Fig. 3, and as its action on these signals is the same as that of the outgoing train on its signals no further description of the action of the signals at station S, block T′, and station S^3 need be given.

In the above description I have assumed that the electric circuits used are of the kind called "open" circuits; but, if desired, the closed-circuit system could be used, the mechanical changes required in this case being too obvious to need particular description.

The signal-boards may be painted in suitable colors or have any desirable distinguishing characteristic, or color-signal lanterns may be substituted.

I claim—

1. In a railway-signal system, the combination of the signal-wheel B, having an auxiliary disk B′, the lever C′, adapted to be operated by the said disk B′, the lever D′, rod E E^2, signal-board E^4, having attached a notched disk H^2, adapted to be held by the armature M′, the armature M′, and electro-magnets, all operating together, substantially as and for the purpose set forth.

2. In a railway-signal system, the combination of the signal-wheel B, having an auxiliary disk B′, the lever C, adapted to be operated by said disk B′, the lever D′, and rod E E^2, having a circuit-closer F, with an electric current, as described, electro-magnets, an armature under electric control, a notch-disk, and signal-board, all adapted to operate substantially as described, and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 16th day of October, A. D. 1891.

URIAH S. JACKSON.

Witnesses:
FRANK G. PARKER,
EDWARD S. DAY.