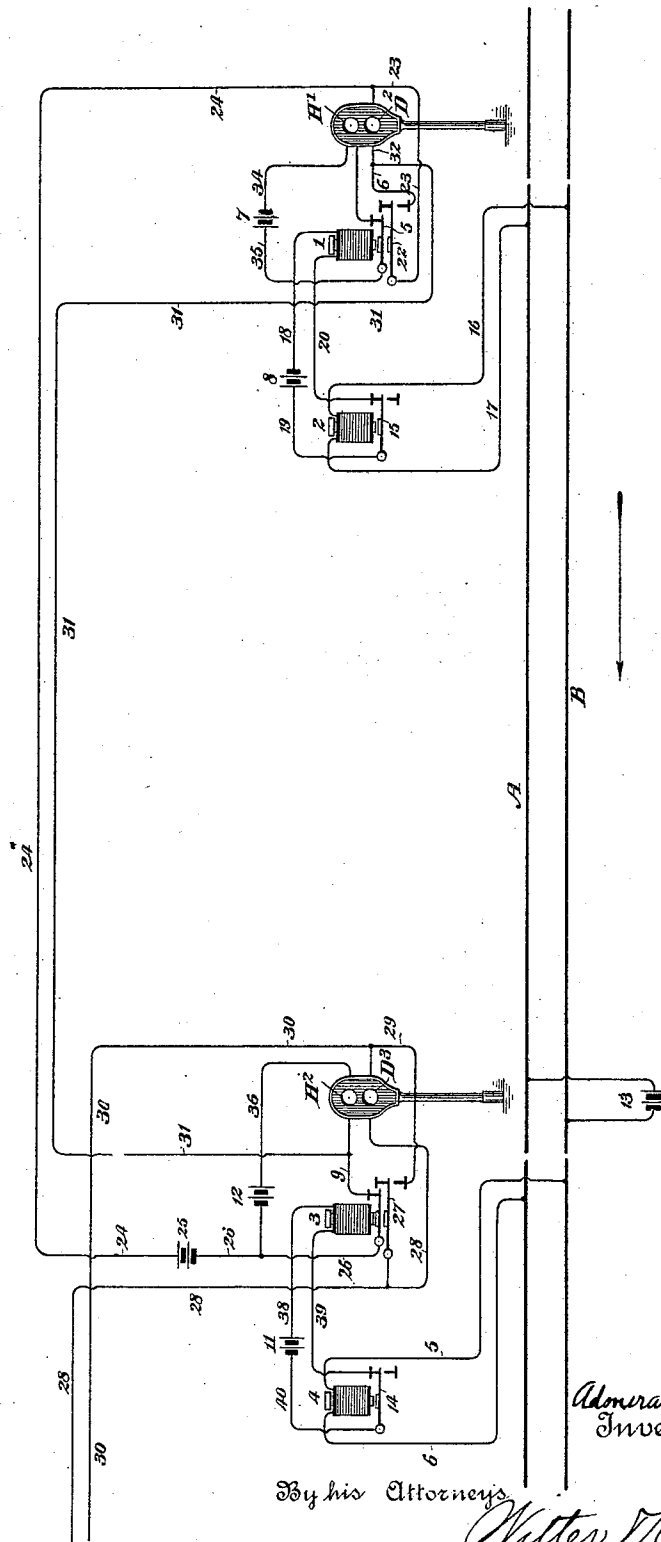


(No Model.)

A. J. WILSON.
ELECTRIC RAILWAY SIGNALING APPARATUS.

No. 471,410.

Patented Mar. 22, 1892.



Witnesses
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ELECTRIC RAILWAY SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 471,410, dated March 22, 1892.

Application filed June 15, 1891. Serial No. 396,300. (No model.)

To all whom it may concern:

Be it known that I, ADONIRAM J. WILSON, a citizen of the United States, residing at Port Chester, in the county of Westchester and State of New York, have invented a certain new and useful Improvement in Electric Railway Signaling Apparatus, which improvement is fully set forth in the following specification and the accompanying drawing, which forms a part hereof.

The invention relates to that class of automatic railway signaling systems operated by the moving train, in which the road is divided up into a number of blocks or sections, with two signals placed at the entrance of each block or section, the one (ordinarily a red signal) indicating the condition of that block itself and the other (ordinarily a green signal) indicating the condition of the next succeeding block of the line, these two signals being ordinarily known as the "home" and "distance" signals, respectively.

The present invention has for its object to more reliably and with simpler mechanism operate such signals; and it consists of the combination of apparatus herein described and claimed.

Heretofore it has been common in manipulating such home and distance signals to cause the home-signal placed at the commencement of any given block to operate the distance-signal placed at that same point when it goes to "danger," whereby the distance-signal would also at the same time go to "danger." In practice this system is untrustworthy, because if any accidental disarrangement of the apparatus prevented the home-signal from going to "danger" when it should go to "danger" the distance-signal does not and cannot remedy the error by itself going to "danger," but it, like the home-signal, remains under such circumstances also clear.

In carrying out my invention I employ a system of circuits and parts, such as that represented in the accompanying drawing, which drawing shows diagrammatically one entire block of a railroad equipped according to my invention and a part of the next succeeding block, with the electrical apparatus found at the beginning of each of the two.

The arrangement of the signals is for a train moving in the direction indicated by the arrow. The road is in any suitable manner divided into blocks of any desired length, as, say, half a mile each. The train entering the block shown in the drawing shunts the current from the battery 13 through its wheels and axles in the well-known way, thereby cutting off the current from the magnet 2, demagnetizing the same, and permitting the circuit-breaker 15 to open, breaking the circuit of the battery 8, thereby demagnetizing the magnet 1, and thereby breaking the circuit of the battery 7 at the circuit-breaker 5, which latter circuit directly operates the signal H'. Thus the signal H' is caused to show "danger." The demagnetizing of the electro-magnet 1 also causes the armature 22 to drop, thereby causing the distance-signal D² to show "danger." The latter result is accomplished in the following manner: The distance-signal D² is normally held clear by reason of its forming part of a normally-closed circuit through which the current of the battery 25 normally flows, the circuit being battery 25, wire 26 9 31 32, distance-signal D², wire 24, to battery. When the armature 22 falls away from the magnet 1 by the demagnetization of the latter, it forms an electrical connection between the wires 6 and 23, which is of small resistance in comparison with the resistance of the magnets necessary to operate the distance-signal D². The current of the battery 25 therefore passes, substantially all of it, from the wire 31, through wires 6, 22, 23, and 24, back to the battery, thereby shunting the magnet that operates the distance-signal D², or sufficiently shunting it to cause the signal D² to show "danger." Thus the distance-signal D² is set at "danger" independently of the home-signal or of the operation of the home-signal H', and if the latter fails to act when the moving train enters the block the former may still act, and thereby give at least a cautionary signal to the engineer. The signals H' and D² are supposed to be at the beginning of the line so far as the signal-circuits are concerned. The signals continue at "danger" in the form of apparatus shown in the drawing so long as the train or any part of it is upon the block

A B, and this through the demagnetizing of the magnets 2 and 1 and the breaking thereby of the circuit operating the home-signal H' and the shunting of the current operating the distance-signal D². When the last wheel of the train has left the block, the electromagnets 2 and 1 are magnetized, the circuit of the battery 7 is closed at 5, thereby clearing the home-signal H', and the short circuit 6 22 23 around the distance-signal D² is broken, thereby sending the current again through the distance-signal D², which would thereupon clear were it not for the action of the train upon such distance-signal D² through the next succeeding primary signaling-circuit of the next block, for as the first wheels of the train enter the next block they in an entirely similar manner demagnetize the electromagnets 4 and 3, breaking the local signaling-circuit of the battery 12 at 9, thereby showing "danger" at the home-signal H² and making the shunt-circuit 27 29 around the distance-signal D³ at 27, and thereby showing "danger" at the distance-signal D³, all as explained in connection with the preceding apparatus; but, in addition to this, the demagnetization of the magnet 3 and the falling away of the circuit-breaker 9 breaks, also, the secondary signaling-circuit of the distance-signal D², situated at the entrance to the preceding block, all as will be entirely evident from the drawing. Thus by my system a train entering a block moves these two signals independently to "danger," the one the home-signal and the other the distance-signal, and also upon entering each block after the first it continues at "danger" the distance-signal situated at the entrance of the preceding block, and this independently of any of the other signals or their operation, and I do this by employing a primary signaling-circuit with each block, adapted to be successively operated by the train in passing over the road, and by causing each primary circuit, when operated by the train, to operate independently both the home and the distance signal at the entrance of the block, and also to operate in case of every block after the first and entirely independent of the other signals the distance-signal situated at the entrance of the preceding block.

I have shown in the drawing each primary

circuit in the form of a rail-circuit, including the entire length of the rails of each block as a part of the circuit. Instead this primary circuit might be a wire-circuit, affected, for instance, in one way by the train on entering the block and restored to its normal condition by the train leaving the block. Again, there might be less or more intervening apparatus between the primary signals of each block and the signaling-circuits of the respective home and distance signals so long as the essential combination of parts is not departed from. Again, the signal itself may be of any desired construction or mode of operation. For instance, it may be operated by some other power than that of electricity itself, the latter acting merely to control or direct the action of such other power; or the part designated by the signals H' D² H² D³, &c., herein may be simply electrically-operated locks, for instance, for locking mechanically or otherwise the operating-signals in place. In none of these cases would the spirit of the invention be departed from. Moreover, many changes of detail could be made which would be obvious and would not depart from the invention.

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

In an electric railway signaling system, a series of home-signals H' H², &c., and a series of primary signaling-circuits respectively operating or controlling said home-signals and themselves operated successively by the train in passing over the road, in combination with a series of distance-signals D² D³, &c., electrically and mechanically independent of the home-signals, and a series of secondary signaling-circuits respectively operating said distance-signals, each of said secondary signaling-circuits having a circuit-breaker adapted to be operated by one of said primary signaling-circuits at a distance and having, also, a short circuit shunting the distance-signal itself and adapted to be operated by the next adjacent primary home signaling-circuit, substantially as and for the purposes set forth.

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Witnesses:

WM. P. HALL,

I. A. MOORHEAD.