

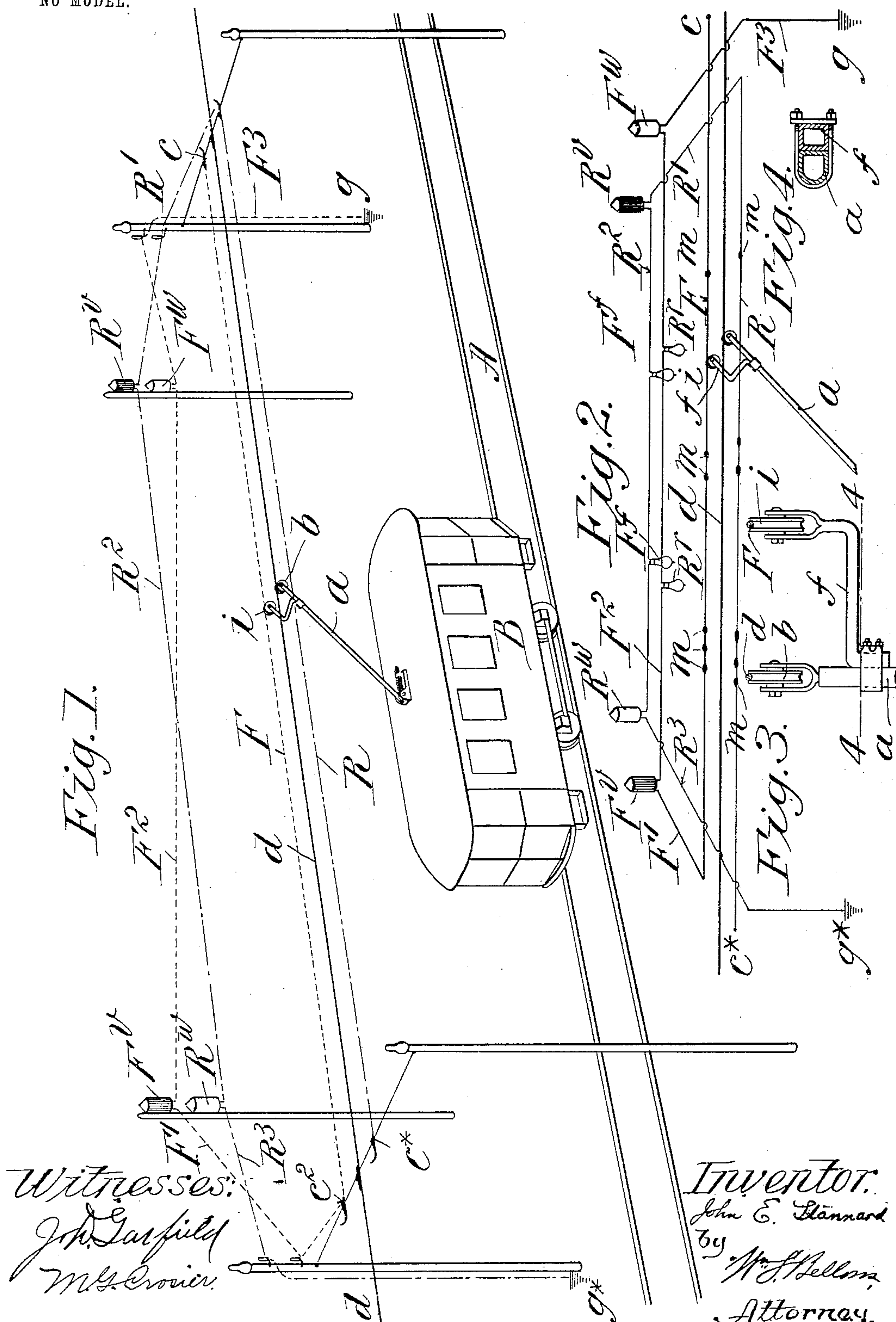
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ELECTRIC SIGNALING APPARATUS.

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NO MODEL.



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ELECTRIC SIGNALING APPARATUS.

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To all whom it may concern:

Be it known that I, JOHN E. STANNARD, a citizen of the United States of America, and a resident of Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Electric Signaling Apparatus, of which the following is a full, clear, and exact description.

This invention consists in arrangements for signaling along the line of a single-track electric railway, the object being to establish signals at the ends of a given "block" or length of track of dissimilar aspect or character, so that a car coming onto the block will have an indication made thereof, for instance, by a white light at the end at which the car had entered and by a red light at the farther end of the block, both of such signals remaining in illumination or active during substantially all of the time the car is on the portion of the track comprised in the block, so that to the motorman on a car approaching or entering the block in the opposite direction may be made known that there is a car coming toward him and so that to the motorman on a car approaching or entering the block in the same direction that the first-mentioned car is traveling may be made known that there is a car in the block ahead going in the same direction.

The invention furthermore comprises arrangements whereby it may be made known not only that a car is within the block, but in which direction it is traveling, such showing being available to any car approaching or within the block traveling in either direction.

I am aware that heretofore contrivances have been proposed and patented for carrying out in a manner and in some part the objects of the present invention; but they have been comparatively complicated, have involved the employment of electromagnetic devices and mechanical switches in conjunction therewith liable to derangement, and simpler proposed arrangements have been adequate to but partially perform the signalings which it is my purpose to attain—that is, principally the automatic signaling not only at the farther end of the block into which the car has entered, but at the rear end of the block as well, the pres-

ent provisions having the duplex capability of so establishing signals at both ends of the block for a car on a single track running in either direction. I am also enabled under the exercise of my invention to have lights show bright along intermediate portions of the block as well as at the ends thereof while a car is in the block, and I am also enabled to cause by a flashing of the signaling-lights or other interruption of the condition established by the car in the block to give an indication at any place where the flashes or signals may be visible that the car in the block is near a "turnout" in the single track.

The signaling arrangements and devices are more particularly shown in the accompanying drawings, in which—

Figure 1 is a perspective view showing a portion of a single trackway and the arrangements of the duplicated signals and connections for a single block, it being here explained that while the block is indicated for clearness of illustration as comparatively short as compared to the width of the railway such block may be of any length—as, for instance, a mile, more or less—and may be either straight, angular, or tortuous. Fig. 2 is a diagram in perspective illustrating the intermediate signals and provisions whereby the locations of a car near turnouts may be made known. Fig. 3 is a front view of a double-contacting trolley. Fig. 4 is a horizontal section on line 4 4, Fig. 3.

In the drawings, A represents the single trackway of the railroad, on which the trolley-car B runs as usual, having the trolley-pole *a* and the usual trolley *b* to run on the feed-wire *d*. Ranging along at the opposite sides of the feed-wire comparatively near thereto and parallel therewith are wires F and R, the drawing and diagram being by different delineation to enable one wire and the connections in circuit therewith to be distinguished from the other and its connections. The said wires F and R are supported on the same cross-wires as the trolley-wire and suitably insulated from such supports, and the wire F may be traced from the starting-point at the support and insulator *c* forwardly to the other end of the block and thence having

the lateral-wire continuation F' through an electric lamp F^v , having a red globe, being continued in the wire extension F^2 , supported parallel with the trackway, to connection
 5 through a second electric lamp F^w , which in this case is advantageously one with a white globe, the wire thence being continued in the length F^3 and grounded at g . The aforementioned red-globe lamp F^v is located at the
 10 end of the block farther from the end at which the car is shown as having entered, while the white-globe electric lamp F^w is located near the entrance end of the block. The other wire R , parallel with the feed-wire, may be
 15 considered as having its starting end at c^* and having the extension R' extended laterally and continued through and in connection with the red-globe lamp R^v adjacent the aforementioned white-globe lamp F^w . The wire is
 20 further continued in the length R^2 to and in connection through the white-globe lamp R^w , adjacent the aforementioned red-globe lamp F^v , for the other circuit, the wire being by the further length or continuation R^3 carried
 25 to the ground at g^* , or the wires of the both circuits traced as above instead of being directly grounded may be otherwise terminated for corresponding effect, as by being carried to the track-rail.

30 The pole of the trolley-car has an offset arm f , carrying a second trolley-wheel i or equivalent contacting member, to run while the usual trolley-wire B is in contact on the feed-wire on either of the parallel conductors F R ,
 35 according as to whether the car is running in the forward direction, as indicated in the drawings, or in the reverse direction.

Now, as shown in the diagrams, a current taken off from the feed-wire is, through the
 40 arm f and the contact member i , directed to pass for the establishment of a live circuit through the red light F^v at the emerging end of the block and through the white light F^w at or near the entrance end of the block by way
 45 of the connections F' , F^2 , and F^3 , so that immediately the car comes into the block the red light at the farther end will show and also the white light at the entrance end; but inasmuch as the lights F^v and F^w , with the conductor F
 50 and connections in continuation therewith, as stated, suffice only for the signals for a car running in the direction shown and as signals and connections are as much required for cars running within the block in the reverse
 55 direction the provision of a second wire R , the red light R^v , and the white light R^w , adjacent the white light F^w and the red light F^v for the other circuit, with the corresponding connections, as stated, for the said lights R^v
 60 and R^w , are also provided, substantially as shown.

It may be assumed that at suitably-distant places in the block, the length of which is understood as covered by the diagram Fig. 2,
 65 there may be three turnouts, and therefore

along the wires F and R short insulating sleeve-pieces m may be provided suitably near the turnouts, the result of which provision is that the continuity of the circuit will be for
 70 an instant or several instants in rapid succession broken in the passage of the contacting member i over the insulations m , so that the signal-lights pertaining to the circuit corresponding to the wire having the insulations
 75 will be caused to flash, and thus at the ends of the line it may be known that a car is at a turnout in the block, and by having, for instance, one insulated piece for the first turnout, two
 80 insulated pieces for the second, and three insulated pieces for the third turnout, as represented in the diagram, there will be a flashing of the signal-lamps at the ends of the block, once, twice, or thrice, corresponding to
 85 the place at which the car may be at the time thereof, and while in short blocks these flashes of the lamps at the ends of the block may be
 90 perceived by the motorman or conductor on another car which may be within the block I further augment the capability of my signaling system by having intermediate electric
 95 lamps F^f and R^f wired in the connections F^2 and R^2 , which will show bright and also flash simultaneously with the signal-lights at the ends of the block. These lamps may, if desired, have globes of dissimilar colors.

This system comprising, in conjunction with the feed-wire, the two sidewise-ranging signal-system wires F and R and the connections and appliances comprised and arranged in the
 100 length of a block, as described, render it apparent to one on cars on the single track going in the same direction whether or not there is another car in the block ahead running in the
 105 same direction and approximately the location thereof in the block, and, furthermore, and as most important, render it apparent to one on the car in or near the block whether or not
 110 there is a car in the block running in the opposite direction, whereby head-on collisions will be avoided.

While in the description hereinabove given, for brevity and the avoidance of confusion in terms, "red" and "white" lamps have been mentioned, such terms are not to be understood as having a limiting significance, for
 115 manifestly any colors or characters of signals may be interchangeably employed.

It is to be especially appreciated that the present system includes, essentially, but the most simple character of wiring and connections, and there is an entire avoidance of the
 120 employment of any devices pertaining to the signals which have electromagnets, armatures, and circuit making and breaking switches.

Of course it is understood that the trolley-arm a , having the offset extension carrying the wheel or contacting member at one side thereof, is mounted on the top of the car by a swivel and reversible connection, as common
 125 on all trolley-cars, so that when the car is to

run in the opposite direction to that shown in the drawings by swinging the trolley pole or arm around for its inclination toward the opposite end of the car the second contacting member or wheel *i* will while the usual trolley-wheel *b* still runs on the feed-wire have running bearing on the long longitudinal wire R corresponding to the length of the block instead of on the wire F, as in the first instance.

While I have hereinabove referred to the insulated pieces *m* on the signal-system wires, a single one of which, a plurality thereof at intervals, or a plurality of groups thereof at intervals may be used otherwise than in conjunction with a block having several turnouts therein—as, for instance, there may be the one or more of such insulated sections employed in a block, which may be understood as comprising in its length the length of one somewhat long turnout, and the insulated pieces may be located at the ends of the turnout and block to flash-lights at the end or at an intermediate part of the block, or both, upon the presence of the car at or near the end of the block, or the location of such pieces may be along within the length of the block at intervals to show by the signal-lights at the suitable places at which they may be located the approximate location of the car.

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

1. In a signaling system, the combination of a feed-wire, a trolley engaging the feed-wire, an auxiliary trolley carried alongside said trolley, a signal-wire disposed on each side of the feed-wire for a block of trackway, the signal-wires being equidistant from the feed-wire and arranged to be engaged by the auxiliary trolley, the signal-wire on one side being engaged when the trolley is moving in one direction, and the signal-wire on the other side being engaged when the trolley is moving in the opposite direction, a return-wire from one end of one signal-wire extending to the other end of the block and there grounded, a signal

in circuit with the return-wire at each end of the block which signals are of different character, a second wire extending from the other signal-wire at the end of the block where the other signal-wire is grounded, to the other end of the block and there grounded, and a signal in circuit with the latter return-wire at each end of the block which signals are of different character, the adjacent signals at each end of the block being of different character.

2. In a signaling system, the combination of a trolley feed-wire, a trolley engaging the feed-wire, an auxiliary trolley carried alongside the said trolley, the signal-wire F carried alongside the feed-wire for the length of a block, the return-wire F^2 extending for the length of the block, the wire F' connecting the wires F and F^2 , a danger-signal lamp on said wire F' , a ground connection at the other end of the return-wire F^2 , a white signal-lamp on the grounded end of wire F^2 , the second signal-wire R on the opposite side of the feed-wire, the return-wire R^2 connected with the wire R by wire R' , a danger-signal lamp on the wire R' , a ground connection at the other end of the return-wire R^2 , and a white signal-lamp on the grounded end of wire R^2 .

3. In a signaling system, the combination of a trackway including a number of turnouts, a trolley-wire, a signal-wire extending alongside the trolley-wire for a block, a trolley carrying an auxiliary trolley arranged to engage the signal-wire, signal-lamps connected with the signal-wire, and insulating-pieces on the signal-wire at places adjacent the turnouts, the insulating-pieces being differently arranged at the several turnouts, whereby the signal-lamps will be operated to give different signals as the trolley passes the respective turnouts corresponding to the insulated pieces.

Signed by me at Springfield, Massachusetts, in presence of two subscribing witnesses.

JOHN E. STANNARD.

Witnesses:

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