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E. L. ORCUTT.

ELECTRIC SIGNALING DEVICE.

APPLICATION FILED SEPT. 1, 1906.

Fig. 1.

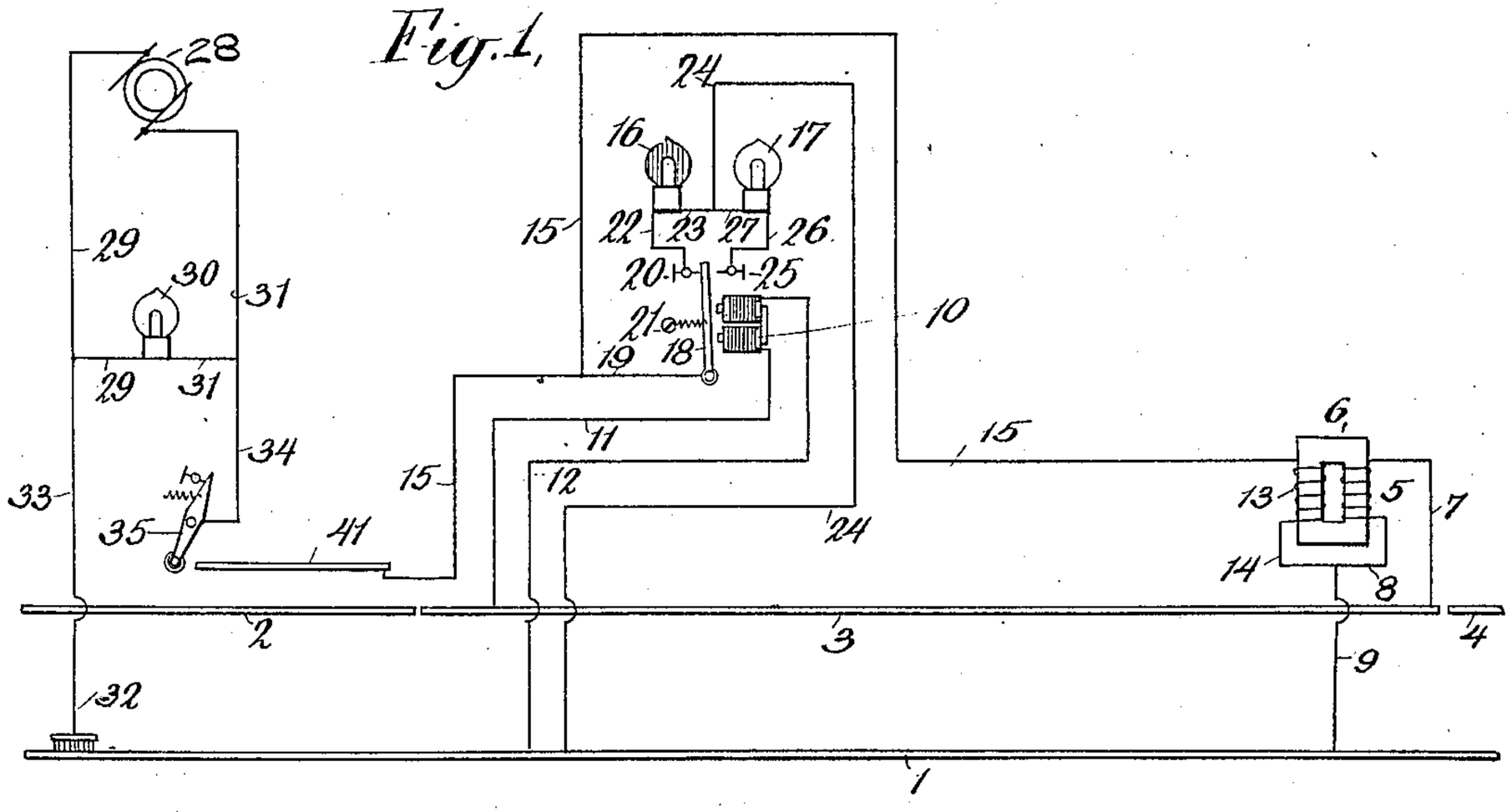
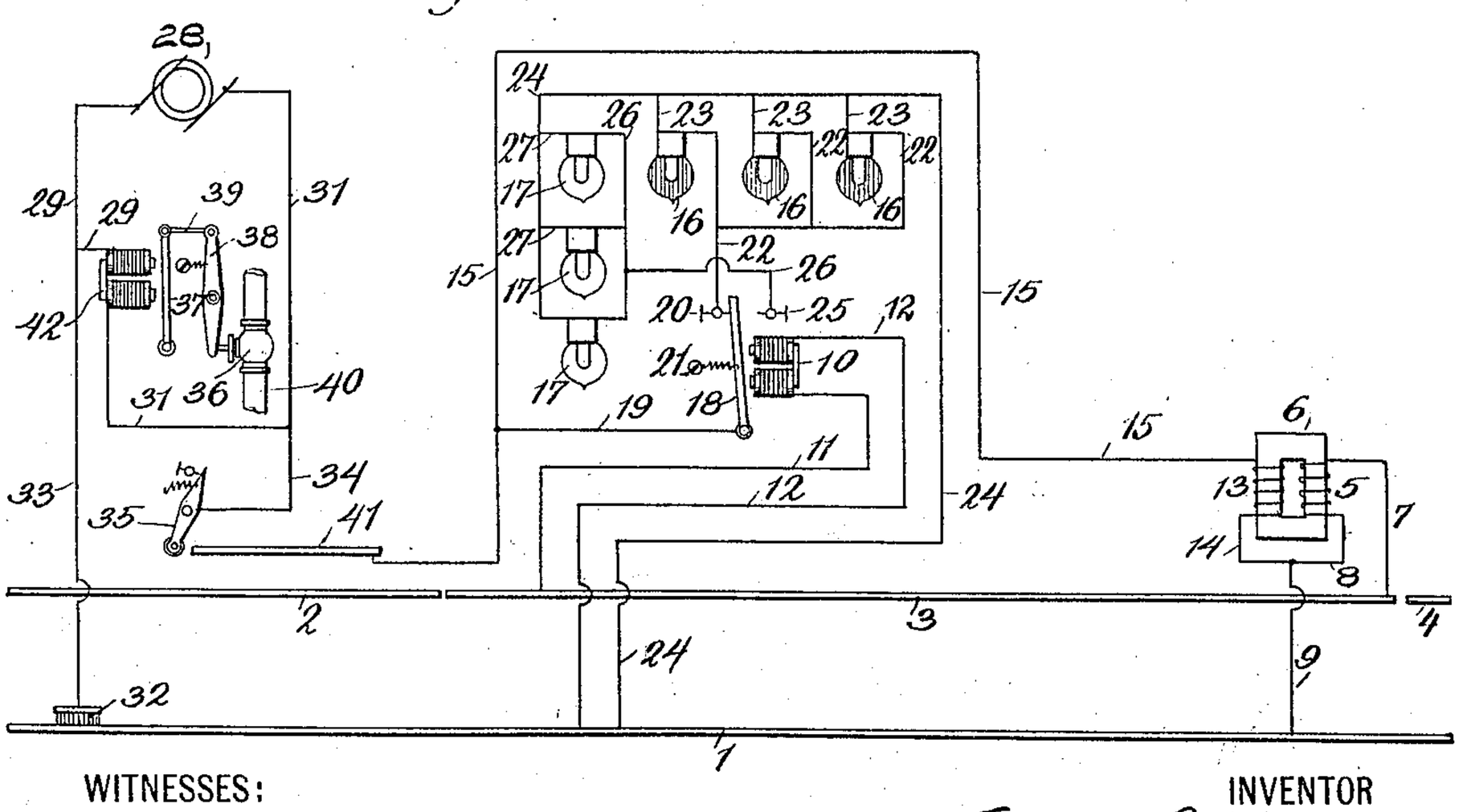


Fig. 2.



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ELECTRIC SIGNALING DEVICE.

No. 855,967. Specification of Letters Patent. Patented June 4, 1907.

Application filed September 1, 1906. Serial No. 333,004.

To all whom it may concern:

Be it known that I, EDWARD L. ORCUTT, a citizen of the United States, and a resident of the borough of Manhattan, in the county, city, and State of New York, have invented certain new and useful Improvements in Electric Signaling Devices for Railways, of which the following is a specification.

This invention relates to improvements in electric signaling devices or systems for railways. It seeks to provide an efficient, reliable and economical arrangement and whereby track signals may be operated in a block system. The signal, or signals, for each block is or are controlled by a track circuit energized by a transformer, and the transformer is energized by a suitable generator carried on a passing train and arranged to be connected with the supply circuit which energizes the transformer when the train is about to enter a block. Each train thus carries a generator, and a track circuit of a block would not be energized until a train was about to enter that block. The transformer may be in any convenient form.

In the accompanying drawings forming part of this specification, and in which like numerals designate corresponding parts in the several figures, Figure 1 represents a diagram of an improved signaling device or system having a single safety and danger signal arranged at the side of the track and embodying the invention; and Fig. 2 represents a diagram of the improved signaling device or system, and in some respects similar to Fig. 1, but differing principally from Fig. 1 in the fact that it has a plurality of track signals.

Referring now to the specific arrangements shown in the drawings, 1 is one of the rails of the track which may be, and preferably is, as shown, electrically continuous. The opposite rail of the track is divided into insulated sections 2, 3, 4, etc. 5 is a secondary coil of an ordinary stationary transformer 6. One end of this coil is connected by wire 7 to the end of the rail section 3. The other end of this coil is connected by wires 8 and 9 to the rail 1. Thus the transformer 6 is connected to the rails near the exit end of the block. 10 is a magnet connected by wires 11 and 12 to the rails 3 and 1, respectively. Thus the magnet 10 is connected in the track circuit which includes rails 1 and 3 and the secondary coil of the transformer.

13 is the primary coil of the transformer, one end of which is connected by wire 14 to wire 9 and the other end of which is connected by wire 15 to the track contact 41. The track contact 41 may be constructed and arranged in any suitable way. It extends for some distance immediately in advance of the entering end of the block and preferably consists of a rail fixed on the road-bed. The magnet 10 is arranged to control the track signal. This signal may be of any convenient type and may be operated by any convenient source of power.

In the preferred arrangement and as shown in the drawings, the track signal is operated by the current of the supply circuit of which the wire 15 is a part. The track signal, as shown in Fig. 1 of the drawings, consists of two electric lamps 16 and 17, the former of which would be colored red to indicate danger, and the latter of which would be white to indicate safety. These two lamps together constitute a signal capable of giving danger and safety indications and they are arranged, as shown in the drawings, to be operated by a current in the supply circuit. In this arrangement, armature 18 of magnet 10 is connected by wire 19 to wire 15. Back contact 20 is connected by wires 22 and 23 to wire 24, and front contact 25 is connected by wires 26 and 27 to contact 24. Wires 22 and 23 include the lamp 16, and wires 26 and 27 include the lamp 17. Wire 24 is connected to rail 1. Spring 21 normally holds armature 18 on its back contact 20. Thus it will be seen that the armature 18 and one of the lamps 16 or 17, is connected in a shunt to the supply circuit. When magnet 10 is energized, lamp 17 will be in the shunt, and when the magnet is deënergized lamp 16 will be in this shunt.

28 is a generator located on the train. One pole of the generator is connected by wires 31 and 34 to a shoe, brush, or other convenient form of traveling contact 35 carried by the train. The other pole of the generator is connected by wires 36 and 33 to a traveling contact 32 carried by the train and arranged to make connection with the rail 1. The contact 35 is arranged to make connection with track contact 41.

30 is a signal, and preferably a lamp, con-

nected to wires 31 and 36 in circuit with the generator. This lamp, or signal 30 is preferably located in the engine cab and indicates to the engineer whether or not the generator 28 is in working order. The contact 32 makes continuous electric connection with rail 1.

In the operation of the system, when the train reaches the track contact 41, contact 35 makes electric connection therewith. This contact 41 extends for some distance along the track immediately in advance of the block guarded by the signal lamps 16 and 17. When contacts 35 and 41 make connection, the supply circuit is closed. This circuit is as follows—from generator 28, wires 31 and 34, contacts 35 and 41, wire 15, primary coil 13 of transformer 6, wires 14 and 9, rail 1, contact 32 and wires 33 and 36, back to generator 28. This circuit energizes secondary coil 5 of transformer 6 and energizes the track circuit through magnet 10. If there is no preceding train in the block guarded by signal lamps 16 and 17—that is, on rails 1 and 3, magnet 10 will be energized so that armature 18 will move to front contact 25. This will close the shunt which includes safety lamp 17 and cause this lamp to light up and show safety to the engineer on the train. If, however, there is a preceding train in the block, that is on rails 1 and 3, track magnet 10 will be shunted by the train so that armature 18 will remain on back contact 20. This closes the shunt which included danger lamp 16. This will cause lamp 16 to light up and show danger to the engineer. If neither of the lamps 16 or 17 light up, this would indicate a break or other failure in the supply circuit and would be taken to mean a danger indication to the train about to enter the block guarded by the signal.

In Fig. 2 there are a plurality of track signals 16 and 17. As there shown, the three danger signal lamps 16 are arranged in multiple and connected on one side to back contact 20 and on the other side to wire 24. The three safety signal lamps 17 are arranged in multiple and connected on one side to the front contact 25 and on the other side to the wire 24. Thus when the supply circuit is energized and magnet 10 is also energized all the safety lamps 17 will light up to show safety. If, however, the supply circuit is energized and magnet 10 is not energized, all the danger lamps 16 will light up. In Fig. 2, a magnet 42 takes the place of lamp 30 in Fig. 1. This magnet 42 operates an armature 37 connected by link 39 to lever 38. Lever 38 operates a valve 36 in a fluid pipe 40 which may operate a whistle, or other suitable alarm, or control the air brakes.

Various other changes may be made beside those herein indicated without departing from the invention.

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

1. In an electric signaling system for railways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer; a generator on a train arranged to be connected with the supply circuit to energize the transformer; and a signal controlled by said magnet.

2. In an electric signaling system for railways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer; a generator on a train; contacts on said train connected with the generator and arranged to make connection with the supply circuit; and a signal controlled by said magnet.

3. In an electric signaling system for railways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer, the rails on one side of the track, and a track contact; a generator on a train; contacts on the train connected with said generator and arranged to make connection with said track contact and track rails of the supply circuit; and a signal controlled by said magnet.

4. In an electric signaling system for railways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer; a generator on a train arranged to be connected with the supply circuit to energize the transformer; and a track signal controlled by said magnet.

5. In an electric signaling system for railways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer; a generator on a train; contacts on said train connected with the generator and arranged to make connection with the supply circuit; and a track signal controlled by said magnet.

6. In an electric signaling system for railways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer, the rails on one side of the track, and a track contact; a generator on a train; contacts on the train connected with said generator and arranged to make connection with said track contact and track rails of the supply circuit; and a track signal controlled by said magnet.

7. In an electric signaling system for rail-

ways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer; a generator on a train arranged to be connected with the supply circuit to energize the transformer; and a signal controlled by said magnet and operated by the current in the supply circuit.

8. In an electric signaling system for railways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer; a generator on a train; contacts on said train connected with the generator and arranged to make connection with the supply circuit; and a signal controlled by said magnet and operated by the current in the supply circuit.

9. In an electric signaling system for railways; the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer, the rails on one side of the track, and a track contact; a generator on a train; contacts on the train connected with said generator and arranged to make connection with said track contact and track rails of the supply circuit; and a signal controlled by said magnet and operated by the current in the supply circuit.

10. In an electric signaling system for railways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer; a generator on a train arranged to be connected with the supply circuit to energize the transformer; and a track signal controlled by said magnet and operated by the current in the supply circuit.

11. In an electric signaling system for railways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer; a generator on a train; contacts on said train connected with the generator and arranged to make connection with the supply circuit; and a track signal controlled by said magnet and operated by the current in the supply circuit.

12. In an electric signaling system for railways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer, the rails on one side of the track, and a track contact; a generator on a train; contacts on the train connected with said generator and arranged to make connection with said track contact and track rails of the supply circuit; and a track signal controlled by said magnet and operated by the current in the supply circuit.

13. In an electric signaling system for railways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer; a generator on a train arranged to be connected with the supply circuit to energize the transformer; and a plurality of signals controlled by said magnet.

14. In an electric signaling system for railways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer, the rails on one side of the track, and a track contact; a generator on a train; contacts on the train connected with said generator and arranged to make connection with said track contact and track rails of the supply circuit; and a plurality of track signals controlled by said magnet.

15. In an electric signaling system for railways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer; a generator on a train arranged to be connected with the supply circuit to energize the transformer; and a plurality of signals controlled by said magnet and operated by the current in the supply circuit.

16. In an electric signaling system for railways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer, the rails on one side of the track, and a track contact; a generator on a train; contacts on the train connected with said generator and arranged to make connection with said track contact and track rails of the supply circuit; and a plurality of track signals controlled by said magnet and operated by the current in the supply circuit.

17. In an electric signaling system for railways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer; a generator on a train arranged to be connected with the supply circuit to energize the transformer; and a signal consisting of a danger electric lamp and a safety electric lamp arranged to be cut into and out of circuit by said magnet.

18. In an electric signaling system for railways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer; a generator on a train arranged to be connected with the supply circuit to energize the transformer; and a track signal

consisting of a plurality of danger electric lamps and a plurality of safety electric lamps arranged to be cut into and out of circuit by said magnet.

19. In an electric signaling system for railways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer; a generator on a train arranged to be connected with the supply circuit to energize the transformer; and a signal consisting of a danger electric lamp and a safety electric lamp arranged to be cut into and out of circuit by said magnet and operated by the current in the supply circuit.

20. In an electric signaling system for railways, the combination of a rail circuit including both rails of the track, a transformer, and a magnet arranged to be shunted by a passing train; a supply circuit including said transformer; a generator on a train arranged to be connected with the supply circuit to energize the transformer; and a track signal consisting of a plurality of danger electric lamps and a plurality of safety electric lamps arranged to be cut into and out of circuit by said magnet and operated by the current in the supply circuit.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

EDWARD L. ORCUTT.

Witnesses:

RICHARD SHELDON,

LEONARD DAY.