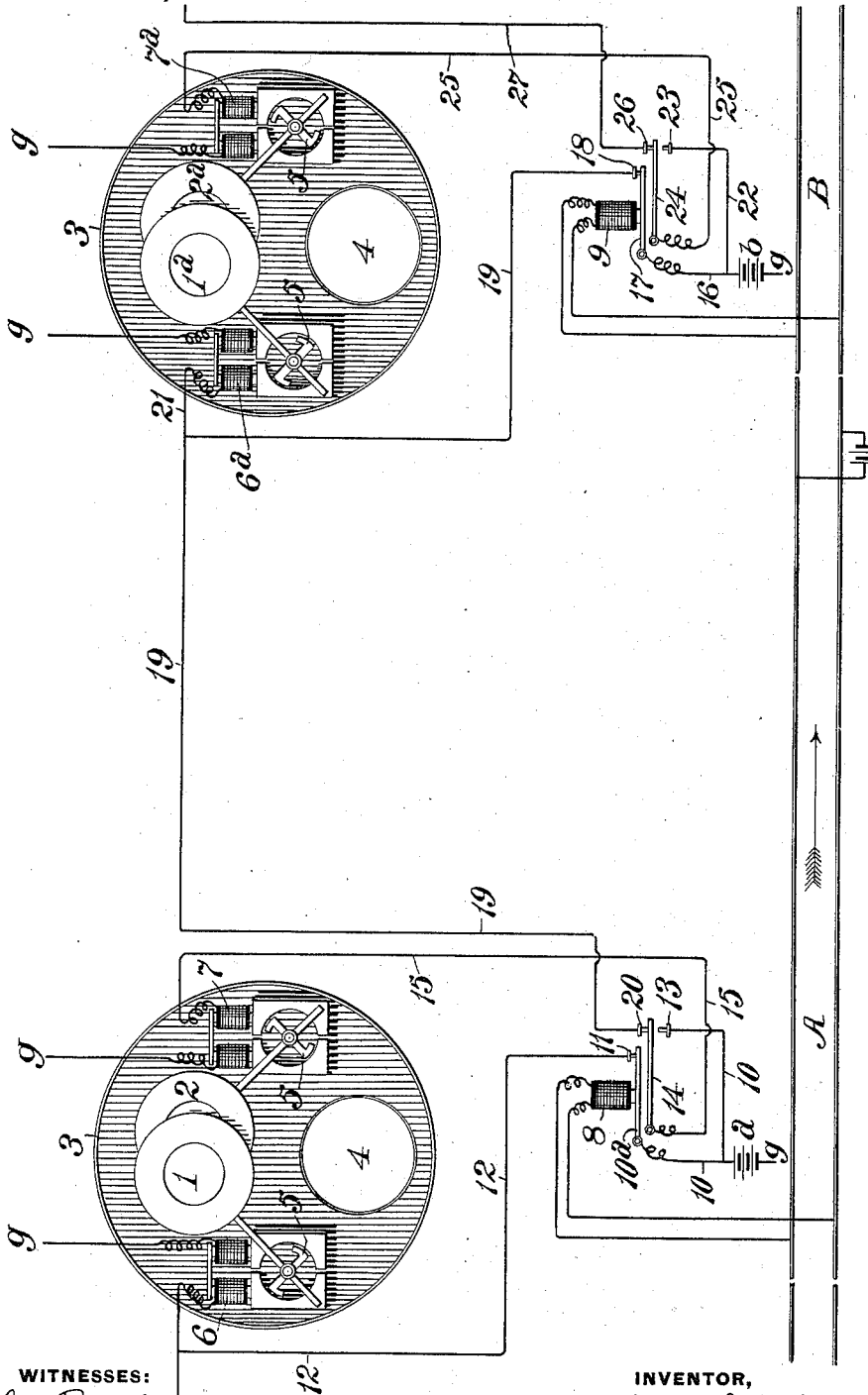


(No Model.)

J. P. CULGAN.
AUTOMATIC SIGNALING.

No. 566,503.

Patented Aug. 25, 1896.



WITNESSES:

Chas. F. Miller
J. E. Gaither

INVENTOR,

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by *Dan Wolcott*

Att'y.

UNITED STATES PATENT OFFICE.

JOHN P. CULGAN, OF SWISSVALE, PENNSYLVANIA, ASSIGNOR TO THE
UNION SWITCH AND SIGNAL COMPANY, OF SAME PLACE.

AUTOMATIC SIGNALING.

SPECIFICATION forming part of Letters Patent No. 566,503, dated August 25, 1896.

Application filed March 18, 1896. Serial No. 583,682. (No model.)

To all whom it may concern:

Be it known that I, JOHN P. CULGAN, a citizen of the United States, residing at Swissvale, in the county of Allegheny and State of Pennsylvania, have invented or discovered a certain new and useful Improvement in Automatic Signaling, of which improvement the following is a specification.

The invention described herein relates to certain improvements in automatic signals, and has for its object the arrangement of two banners in a case or shell in such manner as to be shiftable into and out of line with a common aperture and in an arrangement of circuits and operating-magnets, whereby the banners are shifted successfully into line with the aperture in the case or shell.

It is a further object of the invention to provide for the successive control of a signal by two successive track-circuits.

In the accompanying drawing, forming a part of this specification, my invention is illustrated diagrammatically.

It has heretofore been customary to place the home and distant signals on different posts, or in different horizontal planes on the same post, so that the engineer is required to look in different places for his signal. It sometimes happens that the home signal (controlling the section the train is entering) will be clear, while the distant signal, which pertains to the next section, will be at "danger." When the signals are in such relative positions, and are differently located, the engineer is liable to neglect to ascertain the position of the distant signal, and if the home signal controls a short section and the preceding train is at or near the entrance of the next section, there is great liability of an accident; but by so arranging the home and distant signals on one post that only one signal can be shown at a time there will be small liability of accident, as the engineer can have but one indication.

In the embodiment of my invention shown in the drawing, the signals are of the banner type, the home-signal banners 1 and the distant-signal banners 2 being so mounted in the case or shell 3 as to be movable into and out of line with a common aperture 4. The banners are so mounted that when free to

move they will drop into line with the aperture 4. The revolving armatures 5 are so connected to the banners as to shift them out of line with the aperture when rotated by magnets 6 and 7. As is customary, the rails of sections A B, &c., form parts of the circuits of the magnets 8 and 9.

The circuit for the magnet 6, operating the home signal 1, consists, starting from battery *a*, having one of its poles grounded, of wire 10, armature 10^a, of magnet 8, front contact 11, wire 12, magnet 6, to ground. The magnet 7 for operating the distant signal 2 is included in two circuits, one controlled by track-circuit of section A and the other controlled by track-circuit of succeeding section B. One circuit starts from battery *a*, and is formed by wire 10, back contact 13, armature 14 of magnet 8, wire 15, magnet 7, to ground. The other circuit starts from battery *b*, preferably located at or near the entrance to section B, having one of its poles grounded, and consists of wire 16, armature 17 of magnet 9, front contact 18, wire 19, front contact 20, armature 14, wire 15, magnet 7, to ground. The circuit of magnet 6^a, operating signal 1^a, is formed by battery *b*, wire 16, armature 17, front contact 18, wire 19, wire 21, magnet 6^a, to ground. One circuit of the magnet of distant signal 2^a starts from battery *b*, and is formed by wire 22, back contact 23, armature 24 of magnet 9, wire 25, magnet 7^a, to ground. The second circuit of the signal-magnet 7^a is formed in part by wire 25, the front contact 26, armature 24 of magnet 9, and a wire 27, extending to a battery at or near the entrance to the next succeeding station.

When the tracks are in normal condition and unoccupied, the magnets 8 and 9 will be energized, and the circuits of signal-operating magnets 6 6^a and 7 7^a closed, thereby holding the signal-banners 1 1^a and 2 2^a out of line with the aperture in the signal shell or case, indicating "clear track." As the train enters upon section A, the relay 8 will be short-circuited, thereby permitting the armatures 10^a and 14 to move away from the front contacts 11 and 20. The movement of the armature 10^a from its front contact breaks the circuit of battery *a* through the signal-operating magnet 6, thereby permitting the home

signal 1 to drop to danger position and protect the rear of a train passing along section A. The movement of armature 14 from its front contact 20 breaks the circuit of battery *b* through signal-magnet 7, so that the distant signal 2 would drop to "danger" but for the completion of the circuit of battery *a* through signal-magnet 7 by the movement of armature 14 against its back stop 13. The home and distant signals are held one in danger position in line with the aperture in the case or shell and the other out of line with such aperture as long as a train is on section A. When the train passes off section A and enters section B, the relay 8 is energized, restoring the circuit of signal-magnet 6 by the movement of the armature 10^a against the front contact 11, and thereby shifting home signal 1 to "safety." The energizing of relay 8 and the consequent movement of its armature will break at contact 13 the circuit of battery *a* through distant-signal magnet 7, and will close at contact 20 the circuit of battery *b* through the magnet 7, but as the train on leaving section A enters section B the magnet 9 will be short-circuited, permitting armature 17 to move away from contact 18, thereby breaking the circuits of battery *b* through distant-signal magnet 7 and home-signal magnet 6^a, whereupon signals 2 and 1^a will drop to and remain at danger position until the train has passed off section B.

It will be understood from the foregoing that the home signal of one section and the distant signal for the next section will alternately assume the same position, and as these signals are rendered clearly distinctive by color or shape the condition of two sections will be clearly indicated to the engineer of

the approaching train, and he is not required to hunt for two signals.

I claim herein as my invention—

1. In a signaling system, the combination of two or more track-circuits controlled by movements of trains, two or more electrically-controlled home signals controlling train movements along the track-sections, two or more electrically-controlled distant signals indicating the positions of succeeding home signal or signals, each distant signal being arranged to occupy the position of the home signal of the preceding section, a circuit for each of the home signals including a distant signal-operating mechanism, a second circuit for the distant signal, and circuit-breakers in said circuits controlled by the track-circuits, said signal-circuits and circuit-breakers being so arranged that the movement of a distant signal is controlled by two adjacent track-circuits, substantially as set forth.

2. In a signaling system, the combination of an electrically-controlled home signal and an electrically-controlled distant signal for a succeeding track-section, said signals being arranged to occupy alternately the same location relative to a passing train, electric circuits for said signals having circuit-breakers controlled by train movements, said circuit-breakers being so arranged as to break the circuit of one signal when the circuit of the other signal is completed, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JOHN P. CULGAN.

Witnesses:

DARWIN S. WOLCOTT,
F. E. GAITHER.