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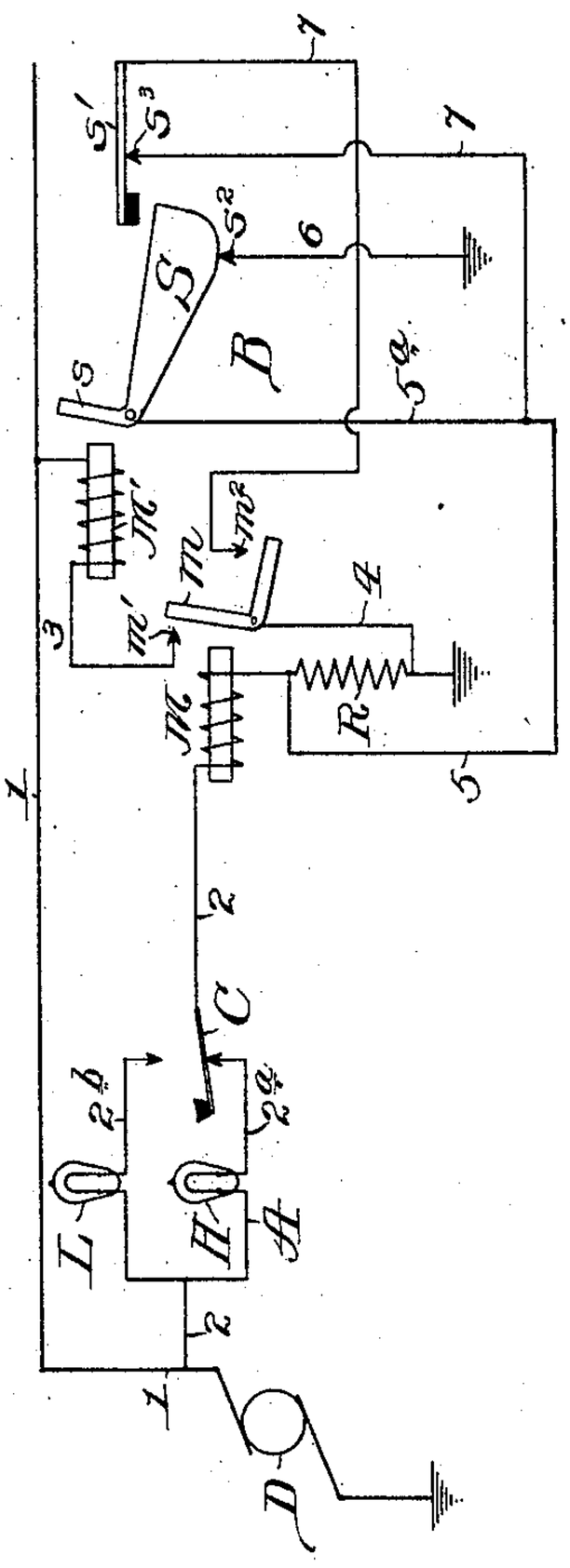
C. E. SCRIBNER.

TRAIN DESPATCHING SYSTEM.

APPLICATION FILED JULY 9, 1906.



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TRAIN-DESPATCHING SYSTEM.

No. 843,039. Specification of Letters Patent. Patented Feb. 5, 1907.

Application filed July 9, 1906. Serial No. 325,221.

To all whom it may concern:

Be it known that I, CHARLES E. SCRIBNER, a citizen of the United States, residing at Jericho, in the county of Chittenden and State of Vermont, have invented a certain new and useful Improvement in Train-Despatching Systems, of which the following is a full, clear, concise, and exact description.

My invention relates to signals for electric railways; and its object is to provide simple means by which a signal at an outlying or signal station can be set from a principal or despatcher's station and the position of said signal be automatically and accurately indicated by test-signals at the principal station.

My invention comprises a signal-circuit extending from a principal to an outlying station and having at the principal station means for setting a signal at the outlying station at safety or danger position, as desired, and at the same time placing a test-signal at the principal station under the control of said signal at the outlying station.

More specifically, my invention contemplates a signal-circuit having two alternative branches at the principal station, the closure of one or the other of which sets the signal at the outlying station at safety or danger position, respectively, and at the same time includes in the circuit a test-signal controlled by the signal at the outlying station to automatically indicate the position at which said signal is set.

My invention may be readily understood by reference to the accompanying drawing, which represents diagrammatically the circuits and apparatus which I preferably employ in carrying out my invention.

In the drawing, 1 represents the usual main supply-conductor, such as a trolley-wire, extending from the principal station A to the outlying station B. Said stations are also connected by the signal-circuit conductor 2, branching at the principal station from the main supply-conductor. The dynamo D furnishes current to both of said conductors.

At station A the conductor 2 is provided with two alternative branches 2^a 2^b, in the former of which is a high-resistance signal-lamp H and in the latter a low-resistance signal-lamp L. A switch C is adapted to close the circuit through either branch 2^a or 2^b.

At station B the conductor 2 includes a magnet M and extends through resistance R to ground. A magnet M′ is included in a branch 3, leading from the main conductor 1. This branch is normally open at contact m'; but when the magnet M attracts its armature m said contact is closed to ground through said armature and the conductor 4. When the branch circuit is thus closed, the magnet M′ is energized and attracts its armature s, thus swinging up the semaphore-arm S and setting a danger-signal at the station B.

A normally closed short circuit of resistance R comprises conductors 5 and 5^a, semaphore-arm S, and grounded conductor 6, said short circuit being opened at contact s^2 when the semaphore-arm is swung up. A second short circuit of resistance R comprises conductors 5 and 7, armature m, and conductor 4. This latter short circuit is open at contact m^2, except when the armature m of relay M is in its attracted position. It is normally closed at contact s^3 by switch-arm s', said switch-arm being operated by the semaphore-arm S to open the short circuit at s^3 when the semaphore-arm is swung up to its extreme or danger position.

The various parts are shown in the drawing in the position at which the signal of the outlying station is set at "safety." When the switch C is in the position shown, closing the signal-circuit through branch 2^a, the high resistance of lamp H does not permit enough current to flow to cause relay M to attract its armature m. The circuit including magnet M′ being open at contact m', the semaphore-arm S remains down, thus displaying a safety-signal in the usual manner. In this position of the semaphore-arm a short circuit of resistance R is closed through conductors 5 5^a, semaphore-arm S, and conductor 6, as above described. With the resistance R short-circuited enough current flows over the signal-circuit to brightly illuminate lamp H, thus indicating at station A that the signal at station B is at safety position.

Let us suppose the operator at station A desires to set the danger-signal at station B. He moves the switch C so as to close the circuit through branch 2^b. A low-resistance circuit is thus closed from the main conductor 1, through the low-resistance lamp L, magnet M, to ground through the short cir-

cuit of resistance R comprising conductors 5 5ª, semaphore-arm S, and conductor 6. The magnet M attracts its armature *m*, thereby closing contacts *m'*. The branch circuit 3, including magnet M', is thus closed to ground, and said magnet attracts its armature *s* and swings up the semaphore-arm to danger position. The armature *m* in its attracted position also closes contact m^2 in conductor 7, leading from conductor 4 to conductor 5 and including the normally closed switch *s'*. It is apparent, therefore, that although the short circuit about resistance R through the semaphore-arm is broken at contact s^2 as soon as the semaphore-arm S is raised said resistance is nevertheless still short-circuited through conductors 5, 7, and 4 as long as switch *s'* is closed. The opening of said switch *s'* is dependent upon the semaphore-arm being held in its extreme upward or danger position, thereby raising switch *s'* and opening contact s^3. When the semaphore is set at danger position, both short circuits about resistance R are open, and the signal-circuit is closed only through resistance R. As long as said resistance is short-circuited the lamp L receives enough current to brightly illuminate it, thereby indicating the signal at the outlying station is still at safety position. When the signal-circuit is closed only through resistance R, the lamp L receives current merely sufficient to produce a dull glow, and thus indicates that the signal at B is set at danger position.

If when the danger-signal at B is displayed it is desired to set the safety-signal instead, the switch C is moved so as to include branch 2^a in the signal-circuit. As before stated, when the switch C is in this latter position the magnet M does not receive enough current to attract its armature *m*, and said armature falls back, opening the circuit of the magnet M' at contact *m'*. The consequent deënergization of magnet M' releases the semaphore-arm S and permits the same to fall back to safety position. The closing of the short circuit about resistance R at contact s^2 permits the flow of current through lamp H sufficient to brightly illuminate the same, thus indicating to the despatcher at A that a safety-signal has been set at B. If for any reason the semaphore-arm is not released from danger position, the short circuit about resistance R remains open, as previously described, and hence the flow of current through lamp H is insufficient to cause its bright illumination, thus also indicating at A that the signal at B is still set at "danger" position.

It will be observed that in whichever of its alternative positions the switch C is placed the lamp H or L, respectively, will by its bright illumination or its dull glow indicate that a safety-signal or a danger-signal, respectively, has been set at station B.

Having described my invention, I claim—

1. In a signaling system, the combination with an electromagnetically-operated signal, of an electric circuit for controlling the operation of said signal, means for varying the electrical condition of said circuit to set said signal, a test-signal lamp controlled by said circuit, and means automatically controlled by said first-named signal, for varying the electrical condition of the circuit to control the illumination of said lamp.

2. In a signaling system for electric railways, the combination with a main supply-conductor extending between a principal and an outlying station, of a branch thereof at the outlying station, an electromagnetically-operated signal in said branch, a signal-circuit conductor extending between said stations and receiving current from the main conductor, means in said signal-circuit, operable from the principal station, for controlling said branch circuit and thereby setting said signal, means, actuated by the setting of said signal, for varying the electrical condition of the signal-circuit, and a test-signal at the principal station responsive to said varying electrical condition of the signal-circuit to indicate the signal displayed at the outlying station.

3. In a signaling system, the combination with an electromagnetically-operated signal, of an electric circuit for controlling the operation of said signal, said circuit having alternative branches, the closure of one of which sets the signal for one indication, and the closure of the other sets the signal for an opposite indication, a test-signal in said circuit, and means automatically controlled by said first-named signal for varying the electrical condition of the circuit to control the indication of said test-signal.

4. In a signaling system, the combination with an electromagnetically-operated signal, of an electric circuit for controlling the operation of said signal, said circuit having alternative branches, the closure of one of which sets the signal for one indication and the closure of the other sets the signal for an opposite indication, a test-signal in each of said branches, and means automatically controlled by said first-named signal for varying the electrical condition of the circuit to correspondingly display the test-signal in the closed branch of said circuit.

5. In a signaling system for electric railways, the combination with a main supply-conductor, of a signal-circuit conductor receiving current therefrom and extending from a principal to an outlying station, a branch of said main conductor at said outlying station controlled by said signal-circuit, an electromagnet in said branch circuit, a semaphore controlled by said magnet, means at the principal station for varying the electrical condition of said signal-circuit to con-

trol said branch circuit and thereby to control the operation of said semaphore, means actuated by said semaphore for varying the current in said signal-circuit, and a test-signal at the principal station responsive to the variations in said circuit produced by the semaphore to indicate the position at which said semaphore is set.

6. In a signaling system for electric railways, the combination with a main supply-conductor, of a signal-circuit conductor receiving current therefrom and extending from a principal to an outlying station, a branch of said main conductor at said outlying station controlled by said signal-circuit, an electromagnet in said branch circuit, a semaphore controlled by said magnet, means at the principal station for varying the electrical condition of said signal-circuit to control said branch circuit and thereby to control the operation of said semaphore, a resistance in said signal-circuit at the outlying station, means, actuated by the semaphore-signal in one of its positions, to short-circuit said resistance, and a test-signal at the principal station responsive to the increased current, when said resistance is short-circuited, to give a corresponding signal.

7. In a signaling system for electric railways, the combination with a main supply-conductor extending between a principal and an outlying station, of a branch thereof at the outlying station, an electromagnet included in said branch, a semaphore controlled by said magnet, a signal-circuit conductor extending between said stations and receiving current from the main conductor, said signal-circuit having alternative branches at the principal station, the closure of one of which operates said electromagnet to set the semaphore at one indication and the closure of the other to set the semaphore at an opposite indication, a test-signal in each of said branches, a resistance in said signal-circuit at the outlying station, and means, actuated by the semaphore-signal in one of its positions, to short-circuit said resistance, said test-signals being responsive to the resulting increased current to indicate the position at which the semaphore has been set.

In witness whereof I hereunto subscribe my name this 5th day of July, A. D. 1906.

CHARLES E. SCRIBNER.

Witnesses:
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