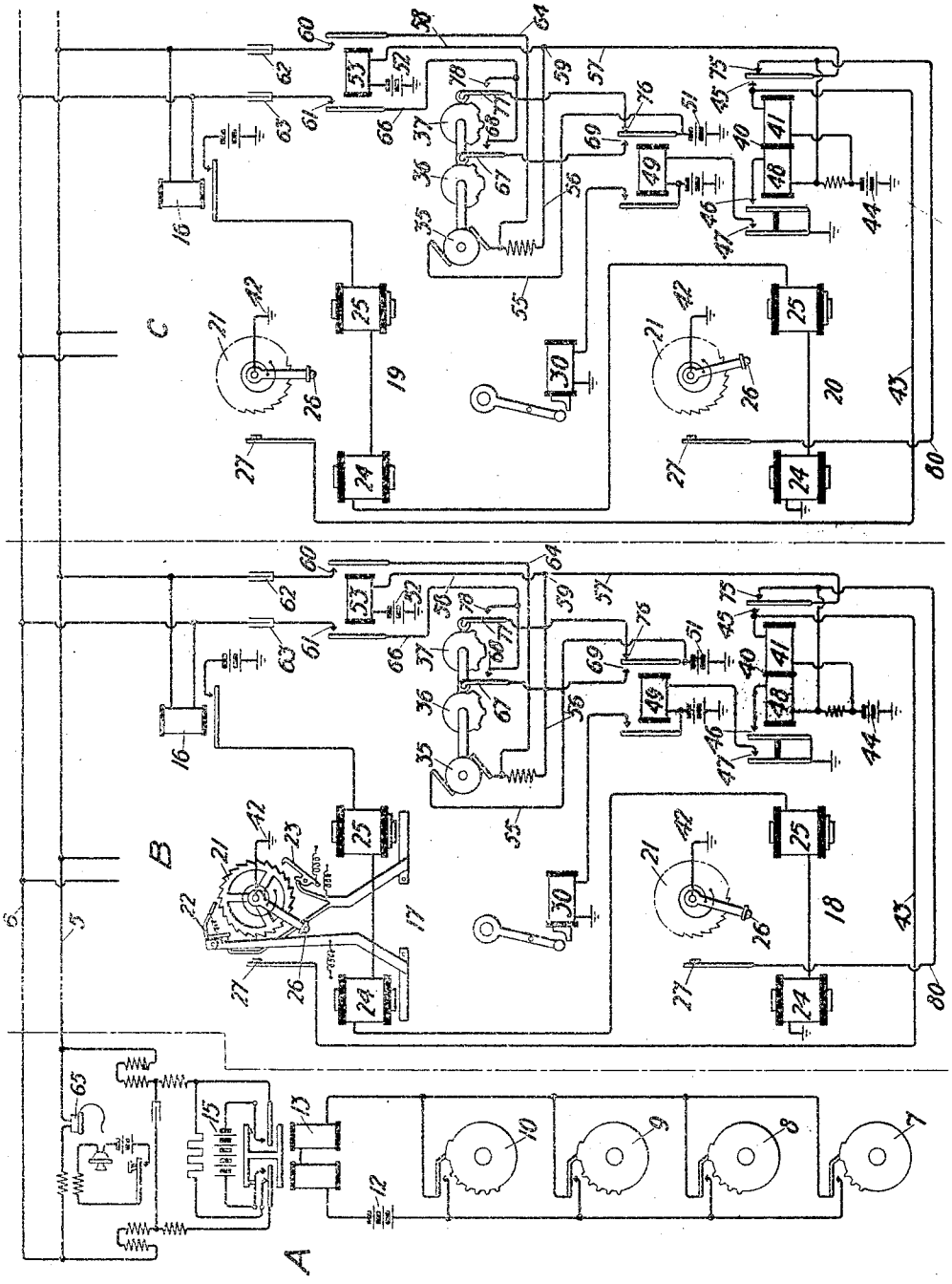
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SELECTIVE SIGNALING SYSTEM.

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SELECTIVE SIGNALING SYSTEM.

1,172,526. Specification of Letters Patent. Patented Feb. 22, 1916.

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To all whom it may concern:

Be it known that I, JOHN BRAYTON HARLOW, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Selective Signaling Systems, of which the following is a full, clear, concise, and exact description.

This invention relates to signaling systems and more particularly to a selective signaling system for despatching trains in which semaphore signals located along the track are selectively set and restored to normal from a distant or despatcher's station.

The object of this invention is to provide means in connection with such a system whereby after the signal is moved into set or clear position, a subsequent operation of the despatcher's apparatus for moving said signal into the same position will result in the despatcher receiving an answer-back signal characteristic of the position of the signal without affecting the position of said signal.

In accordance with the general features of this invention there is provided at each signal selectively operated circuit controlling means operated from the despatcher's station to set a signal to clear or danger position together with an answer-back sending device, and circuit controlling means therefor operated upon each operation of the selectively operated circuit controlling means to cause an answer-back signal to be sent to the despatcher. The answer-back controlling means is operable independently of the operation of the signal or semaphore so that should the despatcher operate the selective circuit closing means to set the signal or semaphore in one position or the other, and said signal or semaphore is already in the desired position the despatcher will receive a characteristic answer-back signal without affecting the signal or semaphore.

The drawing is a diagram of a circuit wired in accordance with this invention.

In the drawing A designates a sending or despatcher's station and B and C waystations connected with line wires 5 and 6. Located at the despatcher's station A are a plurality of transmitters 7, 8, 9 and 10, each included in a local circuit with a battery 12 and an impulse relay 13, which relay is adapted in response to the operation of any one of said transmitters to connect and disconnect a source of energy 15 with the line wires 5 and 6. At each of the waystations B and C is located a relay 16 which is connected in bridge of the line and responds to current impulses from the sending station A. Located at each of the waystations B and C are selectively operated circuit controlling means 17, 18, 19 and 20. Each of said selectively operated means comprises a step by step element 21, stepping and holding pawls 22 and 23 and fast and slow-acting stepping and holding magnets 24 and 25 connected in series and adapted to operate said pawls 22 and 23 to cause the advancement of said step by step element 21 in response to impulses from the sending station. Each step by step element 21 carries a contact arm 26 adapted in the movement of said step by step element 21 to be brought into engagement with a contact member 27. The relation of each of the arms of the several selectively operated devices 17, 18, 19 and 20 to their corresponding spring contact members 27, 27, is such that it will require a different number of current impulses through the operating magnets 24 and 25 of the several devices to bring the arm 26 into engagement with the contact member 27. At each of the waystations B and C is located an electrically operated semaphore signal 30, the circuit of signal 30 at waystation B being adapted to be closed by the operation of the selectively operated device 17 to set the signal and to be opened by the operation of the selectively operated device 18 to clear the signal. The signal 30 at waystation C is adapted to be set and cleared by the operation of the selectively operated devices 19 and 20. Answer-back devices each comprising a motor 35 and coded interrupters 36 and 37 located at the waystations B and C are operated in the operation of the selectively operated devices to transmit to the despatcher a signal to notify him of the position of the signal 30.

The despatcher desiring to set the signal 30 at waystation B will operate the transmitter 7 which will cause a sufficient number of current impulses to be transmitted over the line and through the relay 16 to step the step-by-step element 21 of the selectively operated device 17 into position to bring the arm 26 thereon into engagement with the contact member 27. The engagement of

the arm 26 of the device 17 with the corresponding contact member 27 will complete an energizing circuit for a relay 40 through a winding 41 thereon, this circuit being from ground at 42 through the arm 26, contact member 27, conductor 43 and winding 41 to battery 44. The operation of relay 40 closes contacts 45, 46 and 47. The closure of contact 46 completes a locking circuit through a winding 48 of the relay 40, the closing of contact 47 completes a circuit through a relay 49, which, operating, completes a circuit for the signal 30 and to the code wheel 36 of the answer-back mechanism. The closure of contact 45 completes a parallel path from the batteries 51 and 52 through the field and winding of the motor 35 and a relay 53, the circuit for the motor being from battery 51 over conductor 55, conductor 56, conductor 57, contact 45 and conductor 43 to ground through the contact arm 26. The circuit for the relay 53 will be from battery 52 over conductor 58 to point 59 and from there over the circuit previously traced to ground. The operation of the relay 53 closes contacts 60 and 61 and completes a circuit through condensers 62 and 63 to the line wires for an answer-back tone, the answer-back circuit being from battery 51 through the armature of the motor 35 over conductor 64, contact 60, condenser 62, line wire 5 through a receiver 65 at the sending station A, conductor 6, condenser 63, contact 61, conductor 66 through contacts 67 and 68 interrupted by code wheel 36 and back to the armature of the relay 49 through contact 69 which was closed by the operation of relay 49. Current from the sending station A will be maintained on the line during practically one complete revolution of the transmitter 7 to hold the arm 26 in contact with the contact spring 27, thereby maintaining closed the answer-back circuit above traced. As soon, however, as the transmitter 7 reaches normal position it opens the circuit through the impulse relay 13 and removes current from the line, thus opening the circuit of the selective signaling devices at the waystations and permitting the step-by-step elements 21 to return to normal position. It will be noted, however, that the locking circuit through the relay 40 remains closed so that a subsequent operation of the selectively operated device 17 to circuit closing position will merely cause the operation of the answer-back mechanism in the manner previously described. The relay 49 being energized so long as the relay 40 is energized the signal 30 will remain in set position until released.

In order to release the signal 30 the despatcher operates the transmitter 8 which will cause the transmission of a sufficient number of current impulses to cause the selectively operated device 18 to move its contact arm 26 into engagement with its corresponding contact spring 27, thus short circuiting the winding 48 of the relay 40 and deënergizing said relay to open contacts 45, 46 and 47 and closing a contact 75. Opening of contact 47 breaks the energizing circuit of relay 49 which in turn opens the circuit of the signal 30 and permits said signal to move by gravity to clear position. Upon its deënergization relay 49 also closes a contact 76 to include contacts 77 and 78 interrupted by code wheel 37 of the answer-back mechanism so that the answer-back tone will be through the contacts 77 and 78 instead of 67 and 68 as previously traced, and will be of a different code. The closure of contact 75 completes an operating circuit for the motor 35, which, instead of passing over conductor 43 to ground at the selectively operated device 17, will pass over conductor 80 to ground at the selectively operated device 18. A subsequent operation of the transmitter 8 and the selectively operated device 18 at station B after the signal has been restored to clear position will result merely in the operation of the answer-back device and the relay 53 without affecting the position of the signal 30.

The operation for setting and clearing the signal 30 at waystation C and the obtaining of the answer-back will be precisely the same as described for station B except that such operation will be controlled by the transmitters 9 and 10.

While separate sources of energy are shown at each waystation this is merely for convenience of illustration since in actual practice the current at each waystation will be supplied by a single source.

What is claimed is:

1. In a selective signaling system, a sending station, a waystation, selectively operated circuit controlling means at said waystation, a signal at said waystation, a circuit therefor controlled by said selectively operated means for moving said signal into set, or clear position, answer-back mechanism at the waystation adapted upon operation of said selectively operated means to transmit to the despatcher a characteristic signal denoting the condition of said signal, and means controlled by said selectively operated means for causing a subsequent operation of said answer-back means after the operation of said signal without changing the condition of said signal.

2. In a selective signaling system, a sending station, a waystation, selectively operated circuit controlling means at the waystation, a signal at said waystation, a circuit therefor controlled by said selectively operated means for causing said signal to move to set or clear position, answer-back operating means, means controlled by said selectively operated means for causing the opera-

tion of said answer-back means when said signal is moved into set or clear position, and means whereby a subsequent operation of said selectively operated means may be made to cause the operation of said answer-back mechanism without affecting the position of said signal.

3. In a selective signaling system, a sending station, a waystation, selectively operated circuit controlling means at the waystation, a semaphore signal at said waystation, a circuit for said semaphore signal, switching means controlled by the operation of said selectively operated means for determining the position of said semaphore signal, answer-back means, a circuit therefor controlled by said switching means and means whereby said answer-back means may be caused to operate upon a subsequent operation of the selectively operated means without affecting the position of said semaphore signal.

4. In a selective signaling system, a sending station, a waystation, selectively operated circuit closing means at said waystation, impulse sending means at said sending station for controlling the operation of said selectively operated means, a semaphore signal at said waystation, a circuit therefor, switching means at said waystation controlled by said selectively operated means in response to current impulses from the sending station to open and close the circuit of said semaphore signal to move it to set or clear position, answer-back mechanism at said waystation adapted to transmit a signal to the despatcher designating the position of said semaphore signal, a circuit for said answer-back means including contacts controlled by said selectively operated device and said switching means, the contact in the circuit of said answer-back means remaining closed so long as the signal is in the position last moved, whereby the subsequent operation of said selectively operated device in response to the same number of impulses last transmitted will cause another operation of said answer-back means without affecting the position of said semaphore.

5. In a selective signaling system, a sending station, a waystation, selectively operated circuit controlling means at the waystation, impulse sending means at the sending station for controlling the operation of said selectively operated means, a semaphore signal at the waystation, a circuit therefor, electromagnetic switching means at said waystation, an energizing circuit therefor closed by said selectively operated means in response to a certain number of impulses at the sending station and opened by said selectively operated means in response to a different number of current impulses, a locking circuit for said electromagnetic switching means for maintaining it operated and the circuit closed through said semaphore signal after the release of said selectively operated device, answer-back mechanism, a circuit therefor having one contact closed by said switching means when energized and a second contact for said answer-back mechanism closed by said selectively operated means when moved to position to close the circuit of said switching means, whereby repeated answer-back signals may be obtained at the will of the despatcher without affecting the position of the semaphore signal.

In witness whereof, I hereunto subscribe my name this 19th day of April, A. D. 1915.

JOHN BRAYTON HARLOW.