W. E. HARKNESS.

SELECTIVE SIGNALING SYSTEM.

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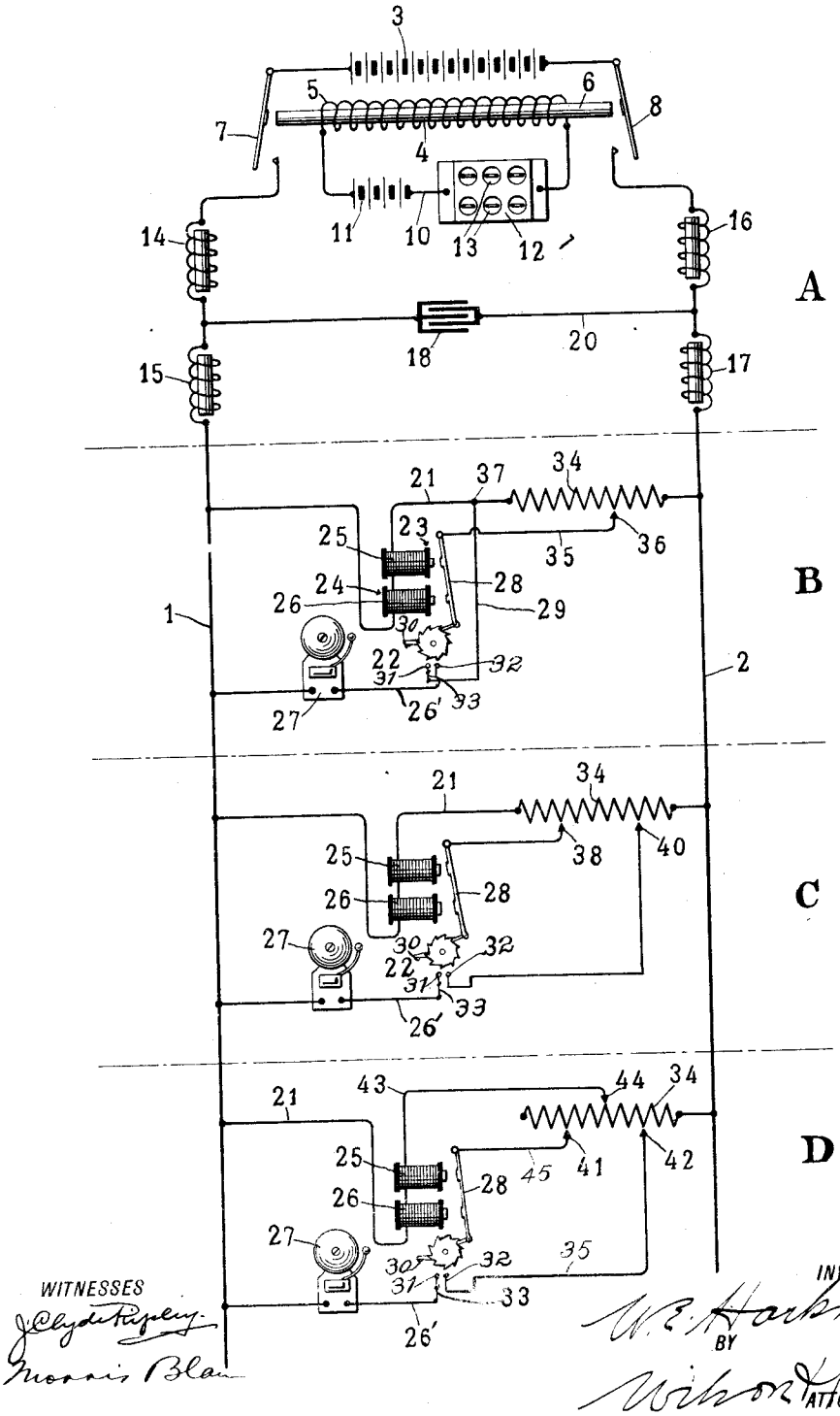

WITNESSES

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SELECTIVE SIGNALING SYSTEM.

1,058,176. Specification of Letters Patent. Patented Apr. 8, 1913.

Application filed December 19, 1911. Serial No. 666,776.

To all whom it may concern:

Be it known that I, WILLIAM E. HARKNESS, residing at East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Selective Signaling Systems, of which the following is a specification.

This invention relates to signaling systems, and more especially to such systems as are adapted for railway train despatching work. As herein shown it is adapted to a telephonic train despatching circuit.

The principal object of the present invention is to so arrange and dispose the various instrumentalities employed in a line adapted for telephonic train despatching work that the electrically operated mechanism at each station will be supplied with a required amount of current which is impressed upon the line from a single source of current supply located preferably at the despatcher's office or sending station.

More specifically, it is the object of the present invention to provide a main line circuit with selective signaling instruments and electro-magnetically operated signals connected in bridge of the line in each of the various receiving stations such that when the bridge containing the electro-magnetically operated signals is closed by the operation of the selector, the amount of resistance in the bridge of the selector will be diminished so that during the operation of the electro-magnetic signal there will be no danger of such diminution of current supply in the selector bridge as would cause the selector contact to be released and the bridge of the electro-magnetically operated signal prematurely opened.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention, accordingly, consists in the features of construction, combinations of elements and arrangements of parts which will be hereinafter described and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawing I have illustrated schematically a preferred embodiment of my invention, and in this drawing which is to be taken as a part of this specification, I have indicated a sending station and three receiving stations, such stations being indicated respectively A, B, C and D, the first mentioned being the sending station, and the latter three the receiving stations. These stations, let it be noted, are arranged along a line, the opposite sides of which are indicated at 1 and 2 respectively. The line is supplied with the operating current by a main line battery located in the despatching station and indicated herein by the numeral 3. Battery 3 is adapted to be applied to the line by means of a relay indicated generally at 4, said relay being provided with a coil 5, the magnet 6 and the armatures 7 and 8. Coil 5 is included in a local circuit 10, the battery 11 and the sending apparatus 12. This sending apparatus, the specific construction of which is not shown herein, is provided with a plurality of operating keys 13, each key when actuated operating to open and close the local circuit 10 in such a way that the relay 4 will be operated to apply a predetermined series of codal impulses upon the main line from the main line battery 3.

Sides 1 and 2 of the line are provided with the usual impedances 14, 15 and 16, 17 respectively, and the usual bridging condenser 18, the latter being connected in a bridge 20 of the line connected intermediate each pair of impedances, 14, 15 and 16, 17 respectively.

From the above description it will be understood that when any of the keys 13 of the sending apparatus 12 is operated, codal impulses will be impressed upon the line from the battery 3, each particular series of such impulses being designed to actuate one of the selective signaling instruments in one of the receiving stations of the line.

Referring now to station B, there is located, in a bridge 21 therein, a selective signaling instrument 22. This selective signaling instrument, the details of the construction of which are not shown herein, is preferably of a type such as is disclosed in the Letters Patent of the United States, No. 906,523, December 15, 1908, issued to Edwin R. Gill. The parts shown herein comprise a pair of magnets 23 and 24, having coils 25 and 26 thereon, said coils, when energized by the codal impulses impressed upon the line, operating suitable selective mechanism, whereby the normally open bridge 26′ will be closed and the electro-magnetically operated signal 27 therein operated. The means for closing the normally open bridge 26′, as illustrated herein, comprises an armature 28 arranged to rotate a selector wheel having a contact member 30 which coöperates with

the contact member 31 to engage the contact member 32. Contact member 31 is carried upon the spring member 33 and is normally held away from the contact member 32, but is forced into engagement therewith when the armature 28 moves the contact member 30 into engagement with the contact member 31. It will be seen that when the contact members 30, 31 and 32 are in engagement, the normally open bridge 26′ will be closed and the signal 27 operated.

Located in the closed bridge 21, in which is connected the selector, is a variable resistance coil 34, and the armature 28 is connected, by means of the wire 35, with this resistance coil at the point 36 in station B of the drawings, and the spring member 31 is connected, by the wire 29, with the wire which constitutes the bridge 21, at the point 37 in this station. It will therefore be seen that when the armature 28 operates to close the normally open circuit 26′, a portion of the resistance 34 will be short circuited whereby a greater amount of current will flow through the signal bridge 26′. This increase of current flowing in the bridge 26′ will not however effect a diminution of potential in the closed bridge 21, for the reason that that portion of the resistance coil between the point 36 and the point 37, it will be noted, is shunted by the wire 35, the armature 28, the contact members 30 and 31, spring 33 and wire 29. Therefore the increased potential in the bridge 26′, due to the short circuiting of a portion of the resistance 34, will not cause the selector mechanism to return to normal because the shunting of the remainder of the coil, as above described, will operate to maintain an even potential in the selector bridge.

Referring to the circuit diagram in station C, the armature 28 is connected to the variable resistance coil 34, at the point 38, and the contact member 32 is connected with the resistance coil 34 at the point 40, the spring member 33 being connected with the signal 27. The current for operating the signal 27 will therefore be taken off the resistance coil at the point 40, thereby short circuiting a portion of said coil, and the current for maintaining the selector will be likewise taken off the resistance coil at the point 40 but will again be discharged through a portion of said coil at the point where the wire 35 is connected thereto as at 38. It will be seen, therefore, that the portion of the resistance coil between the points 38 and 40 will be short circuited while the signal 27 is operating.

Referring to the circuit diagram illustrated in station D, the armature 28 is connected with the resistance coil at the point 41, contact member 32 is connected with said coil at the point 42, and the wire 43 which forms a portion of the selector bridge is connected with said coil as at 44. The spring member 33 is connected with the signal 27, therefore, when the armature 28 closes the bridge 26′, the current will flow from one side of the line through a portion of the resistance coil 34 to the point 42, then through the wire 35, contact 32, contact 31, spring 33, then through the remainder of the bridge 26′, and through the signal 27 to the opposite side of the line. The current for causing the selector to maintain the signal bridge 26′, in closed condition, will also be taken off the coil 34 at the point 42, the current then flowing through the wire 35, contact 32, across contact 31 into contact 30, the armature 28, then through the wire 45 to the resistance coil at the point 41, passing through a portion of said coil to the point 44, then through the wire 43, the coils 25 and 26 and the remainder of the selector bridge. In this connection it will be noted that during the operation of the signal 27, that portion of the resistance coil between the points 42 and 44 will be short-circuited.

From the above description it should be clear that I have provided means whereby the current supply to both the selector mechanism and the signal which is to be operated thereby, may be adjusted to a nicety, and whereby the operation of the signal will not effect such a diminution of the current supply in the selector bridge as would allow the selector to return to normal, thereby prematurely opening the signal bridge. It will, of course, be understood that the points of connection of the various wires with the resistance coils 34 may be varied at will to effect the desired adjustment of the electrically operated devices.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention, which as a matter of language, might be said to fall therebetween.

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

1. A signaling system, comprising a line having a plurality of stations, a selector in a closed bridge of said line at each of said stations, an electro-magnetically operated signal in a normally open bridge at each of said stations, said last named bridge being adapted to be closed by the operation of

said selector, variable resistance means in each of said bridges, and means for changing said variable resistance in one of said bridges when the normally open bridge is closed by the said selector.

2. A signaling system comprising a line having a plurality of stations, a selector connected in bridge of the line in each of the said stations, an electro-magnetically operated signal connected in a normally open bridge in each of said stations, said last named bridge being adapted to be closed by the operation of said selector, variable resistance means connected in each of said bridges, and means adapted to cut out a portion of the resistance in the selector bridge when the selector closes the bridge of said electro-magnetically operated signal.

3. In a signaling system, in combination, a line comprising a plurality of stations, a selector connected in bridge of the line at each of said stations, means for impressing signaling impulses upon the line to operate said selectors, an electro-magnetically operated signal connected in a normally open bridge of the line in each of said stations, said last named bridges being adapted to be closed by the operation of said selectors, variable resistance means common to the bridges of each station, and means adapted, when the selector closes the normally open bridge, to cut out a portion of the variable resistance means of the selector bridge.

4. In a signaling system, in combination, a line comprising a plurality of stations, a selector connected in a normally closed bridge in each of the various stations, an electro-magnetically operated signal connected in a normally open bridge in each of said stations, a source of current supply for said line, means for applying signaling impulses from said source of supply to said line whereby said selectors will be operated to close said normally open bridge, variable resistance means, a portion of which is common to both of said bridges and means which are rendered operative by the closure of said bridge by the selector adapted to diminish the normal resistance of said variable resistance means in said selector bridge.

5. In a signaling system, in combination, a line comprising a plurality of stations, a source of current supply in said line, sending apparatus in said line adapted, when operated, to apply signaling impulses from said source of supply to said line, a selector in a normally closed bridge of the line at each station, a signaling device in a normally open bridge at each of said stations, said last named bridge being adapted to be closed by the operation of the selector, a non-inductive resistance in the bridge of each station, and means operable through the closing of the normally open bridge by the selectors to short-circuit a portion of the resistance of the selector bridge.

In testimony whereof I affix my signature in the presence of two witnesses.

WILLIAM E. HARKNESS.

Witnesses:

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