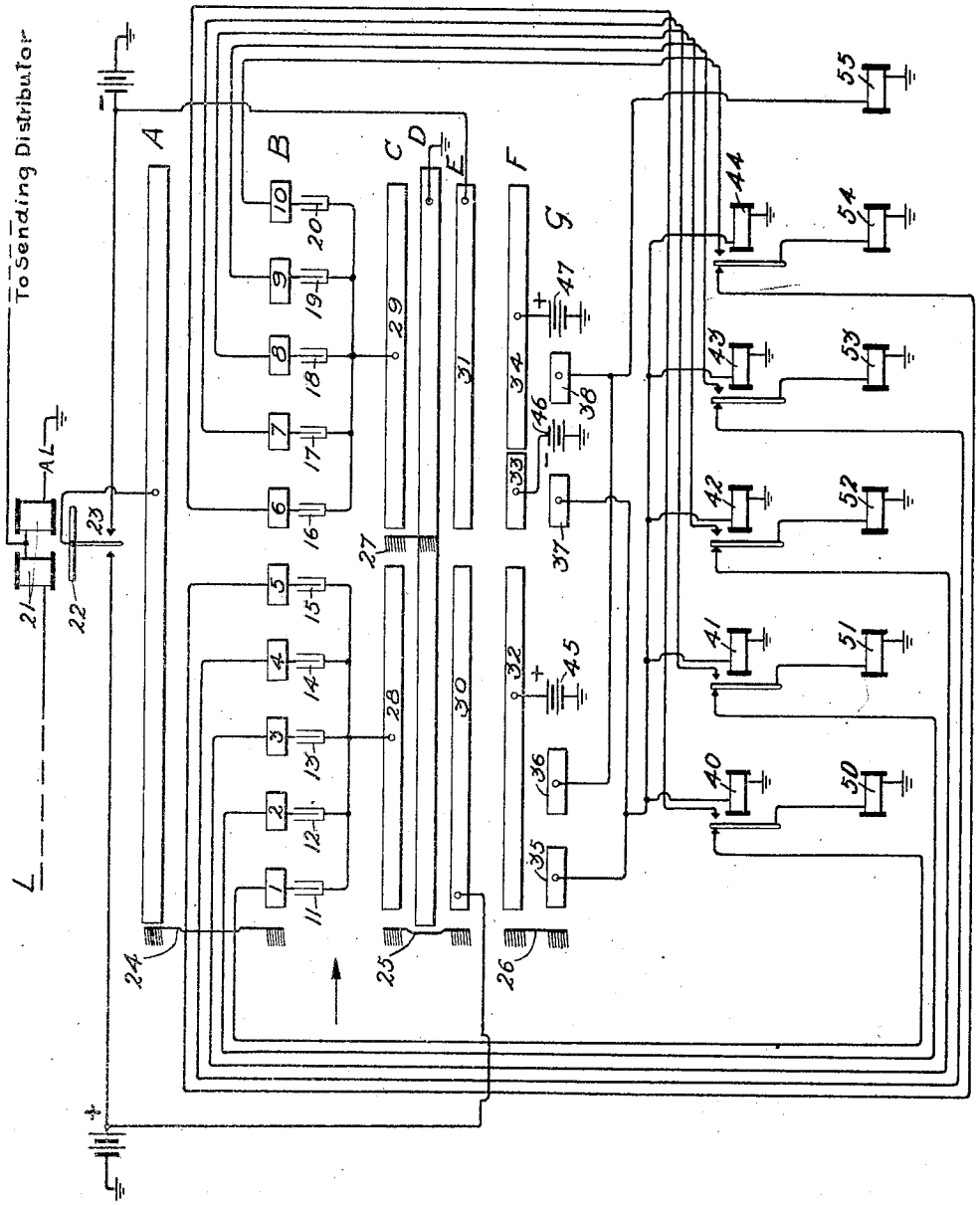
J. H. BELL.

SELECTING SYSTEM.

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1,309,176. Patented July 8, 1919.



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SELECTING SYSTEM.

1,309,176. Specification of Letters Patent. Patented July 8, 1919.

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To all whom it may concern:

Be it known that I, JOHN H. BELL, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Selecting Systems, of which the following is a full, clear, concise, and exact description.

This invention relates to selecting systems particularly adapted for use in duplex printing telegraphs wherein the character signals consist of a definite number of impulses.

The principal object of this invention is to provide means to economize in line time so as to transmit the maximum number of characters per minute with a minimum number of signaling impulses.

A further object of this invention is to simplify and reduce to a minimum the number of mechanically moving parts through the employment of electrical receptors or current impulse storing means.

For the accomplishment of the above objects, the invention comprises signal storage means and current impulse distributing apparatus whereby each successive group of signaling impulses may be stored or retained by suitable means and later released and distributed to effect the operation of suitable recording means, while a subsequent group of signaling impulses is being received and stored in readiness to cause a subsequent operation of the recording means. More specifically, the invention preferably comprises means for distributing the effects of the line current impulses of each group of character combinations to a set of condensers in which the signals are stored until the complete group of signals is received, whereupon the charged condensers are permitted to discharge simultaneously through the windings of selecting magnets to perform some selecting operation, as, for example, the actuation of code bars or selecting disks. This arrangement for causing one group of character signals to effect the operation of suitable recording means while another group of impulses are being stored in readiness to effect a subsequent operation of the recording means provides a complete overlap for the distribution of the effects of the line current impulses and the operation of the selecting mechanism, thereby overcoming the objectionable feature of wasting line time in the transmission and distribution of such impulses.

The preferred embodiment of this invention is illustrated in the accompanying drawing, as applied to the receiving mechanism of a duplex printing telegraph system, but it is to be understood that applicant does not limit his invention to the specific arrangement shown, as the invention is obviously suitable for other purposes where it may be desirable to store current impulses for a definite or predetermined period of time and then employ such stored impulses for performing various functions.

The above and other features of this invention will be fully set forth in the following description and claims, and will be more readily understood by reference to the accompanying drawing wherein the apparatus is shown diagrammatically. In the accompanying drawing, a rotary current distributer is shown developed, and comprises seven rings A, B, C, D, E, F and G, some of which are continuous and others of which are segmented for purposes as will hereinafter appear. The continuous ring A, which is connected to the tongue 23 of a polarized line relay 21, is a common receiving ring. The receiving segments 1 to 10 inclusive of reduced size, comprising the ring B, are arranged to be interconnected with the common receiving ring A by means of a brush 24 carried by a suitable rotatable arm (not shown) and is adapted to sweep over the rings A and B. Connected to each of the receiving segments of the ring B is a condenser of suitable capacity for storing up the effects of the line current impulses or impulses corresponding with impulses received over a line L. Condensers 11, 12, 13, 14 and 15 have one side in common connected to segment 28 of ring C and condensers 16, 17, 18, 19 and 20 have one side in common connected to segment 29 of ring C. Rings C and D form a pair and are arranged to be interconnected by a brush 27 which maintains an angular relation of approximately 180° with respect to the brushes 24, 25 and 26. Rings C and E form another pair and are adapted to be interconnected by the brush 25, while rings F and G form still another pair and are adapted to be interconnected by the brush 26.

The invention as herein disclosed, provides that the current polarity of alternate letter signals be reversed as will presently appear. A plurality of switching relays 40, 41, 42, 43 and 44 are provided for connecting the windings of selecting magnets 50, 51, 52, 53 and 54 alternately with the groups of condensers 11 to 15 inclusive, and 16 to 20 inclusive. The switching relays 40 to 44 inclusive are polarized so that they are energized, say by positive current as indicated by the conventional plus sign in the drawing, and caused to bring their armatures into engagement with the front contacts thereof. When negative battery is applied to the switching relays their armatures fall back and engage the back contacts thereof. A sixth pulse relay or printing magnet 55 included between an earth connection and segments 36 and 38 of ring G is controlled by the distributer brush 26. The segments 36 and 38 are so positioned that immediately after the selecting magnets have functioned the magnet 55 will be energized to effect the printing of the desired character or any other suitable operation.

Let us assume that the brushes 24, 25, 26 and 27 as shown in the drawings are moving in the direction of the arrow and that the brush 24 is ready to interconnect the ring A with segment 1 of ring B; that brush 25 is just moving on to segments 28 and 30 of rings C and D; that brush 26 is just starting on segments 32 and 35 of rings F and G, and that brush 27 is ready to interconnect ring D with segment 29 of ring C. Let us also assume that signals are coming in over the line L to effect the operation of the line relay 21 and that the armature tongue 23 is connecting positive or negative battery to the common ring A, depending upon the polarity of the signaling impulses. As the brush 24 sweeps over ring A and the segments 1 to 5 inclusive, certain of the condensers 11 to 15 inclusive will be charged according to the position of the tongue of the main line relay 21. It is also to be remembered that while brush 24 is passing over the first five segments of ring B, brush 25 is passing over segments 28 and 30 of rings C and D. Now, since one side of each of the condensers 11 to 15 inclusive is connected through segment 28 of ring C, brush 25 and segment 30 of ring E to the positively poled local battery, only those condensers connected to the line relay tongue, while it makes contact with the negative pole of the local battery, will be charged. Now, as brush 26 interconnects segment 32 of ring F with the segment 35 of ring G current will flow from positive battery 45 through the windings of the switching relays 40 to 44 in parallel to ground, causing those relays to bring their armatures into engagement with their respective front contacts. At approximately the same time, brush 27, which follows approximately 180° behind the brushes 24, 25 and 26, also interconnects segment 29 of ring C with ring D, thereby providing ground for the common connection of condensers 16, 17, 18, 19 and 20. Since these condensers have not been previously charged, selecting magnets 50 to 54 inclusive are not affected at this time. After the brush 26 passes from the segment 35 it later interconnects the segment 32 of ring F with segment 36 of ring G, thereby causing current to flow from positive battery 45 through the winding of the printing magnet 55. Since the selecting magnets 50 to 54 inclusive have not as yet been actuated to effect a selection, operation of the printing magnet 55 at this time is an idle or ineffective action.

Let us assume now, that as the brush 24 passed over the first five segments of ring B, condensers 11, 13 and 14 were charged. Now, as brush 24 enters upon the second group of receiving segments 6 to 10 inclusive and brush 25 enters upon segments 29 and 31 of rings C and E, brush 27 will interconnect segment 28 of ring C with ring D and brush 26 will interconnect segment 33 of ring F with segment 37 of ring G. When brush 27 interconnects segment 28 with ring D, ground is connected to one side of the condensers of the first group and when brush 26 interconnects segments 33 and 37 current from negative battery 46 effects the deënergization of the switching relays 40 to 44 inclusive, thereby connecting the other side of the condensers 11 to 15 inclusive to ground, through the back contacts and armatures of switching relays 40 to 44 inclusive and the windings of the selecting magnets 50 to 54 inclusive. Since we have assumed only condensers 11, 13 and 14 to be charged, only the selecting magnets 50, 52 and 53 which are connected with those condensers, will be energized by the discharge current from those condensers. Immediately after a selection has been set up on the selecting magnets 50 to 54 inclusive the brush 26 interconnects segment 34 of ring F with segment 38 of ring G, thereby causing current to flow from positive battery 47 through the winding of the printing magnet 55 to ground, thereby effecting the printing of the character set up by the selecting magnets. Now, while the selecting magnets are functioning in response to the released impulses which were stored up in the first group of condensers and while the printing operation is taking place, a second group of signaling impulses is being stored up in condensers 16, 17, 18, 19 and 20 inclusive. Since one side of each condenser 16 to 20 inclusive is connected through segment 29 of ring C, brush 25 and segment 31 of ring E with the negatively poled local battery, only those condensers will be charged which are

connected to the line relay tongue while it is in contact with the positively poled local battery.

By means of this arrangement it will be seen that there is absolutely no line time lost during the functioning of the local apparatus and that by means of the present arrangement the entire line time may be utilized for the transmission of character signals, as while one group of signals representing a character is being received, a group of impulses representing a preceding character are being translated or recorded in intelligible form.

In order to avoid complicating the drawing, the sending rings of the distributer face have not been shown. It will be readily understood, however, that a pair of rings similar to the continuous ring A and segmented ring B may be used, and the common ring may be connected to the line through the line relay, as shown. Also, no means have been shown for modifying the effects of the condenser discharge but it is to be understood that if necessary resistance may be introduced, for example, in the connection between ground and the ring D to prevent an oscillatory discharge taking place.

The selecting and printing magnets 50 to 55 inclusive may be employed for operating any suitable receiving mechanism such, for example, as disclosed in Patent 1,103,133 dated July 14, 1914.

What is claimed is:

1. In a printing telegraph system, a current distributer, groups of signal storing means in circuit with said distributer, a plurality of selecting magnets, and a plurality of switching relays for alternately connecting said groups of signal storing means in circuit with said selecting magnets.

2. In a printing telegraph system, the combination with a main line, of a current distributer for receiving line current impulses, groups of signal storing means to which the impulses are distributed for storage, a plurality of selecting magnets, and a plurality of switching relays for alternately connecting said groups of signal storing means in circuit with said selecting magnets.

3. In a printing telegraph system, the combination of a current distributer, a plurality of circuits connected thereto, condensers in said circuits and arranged to be charged by current impulses of predetermined polarity, selecting magnets, and means for causing said charged condensers to discharge simultaneously through the selecting magnets to effect their operation.

4. In a printing telegraph system, the combination of a current distributer, a plurality of circuits connected thereto, condensers in said circuits and arranged to be charged subsequently by current impulses of predetermined polarity, selecting magnets, windings for said magnets, and means for causing the said charged condensers to discharge simultaneously through the windings of the selecting magnets to effect their operation.

5. In a printing telegraph system wherein the characters are represented by permutations of impulses, a current distributer for distributing said impulses, sets of signal storage means connected to said distributer, selecting magnets normally connected to one of said sets of signal storage means and disconnected from the other, and electro-mechanisms controlled by said distributer for alternately connecting and disconnecting the said sets of signal storage means to and from said selecting magnets.

6. In a printing telegraph system wherein the characters are represented by permutations of impulses, a current distributer for distributing said impulses, sets of signal storage means connected to said distributer, selecting magnets normally connected to one of said sets of signal storage means and disconnected from the other, and switching relays controlled by said distributer for alternately connecting and disconnecting said sets of signal storage means to and from said selecting magnets.

7. In a printing telegraph system, the combination with a main line, of a current distributer for distributing the line current impulses, a plurality of sets of signal storing means associated with said distributer, selecting mechanism, and a single group of relays for causing said sets of signal storage means to alternately effect the operation of said selecting mechanism.

8. In a printing telegraph system, the combination with a main line, of a current distributer for distributing the line current impulses, a plurality of sets of signal storing means associated with said distributer, selecting mechanism, and a plurality of switching relays for connecting said sets of signal storing means alternately to said selecting mechanism.

9. In a printing telegraph system, the combination with a main line, of a rotary current distributer for distributing the line current impulses, a plurality of groups of condensers associated with said distributer for the storing of impulses, selecting magnets, and a plurality of switching relays controlled by said distributer for alternately connecting and disconnecting said groups of condensers to and from the selecting magnets.

10. In a printing telegraph system wherein the characters are represented by permutations of impulses, the combination with a current distributer, a selecting mechanism comprising a plurality of selecting magnets, whose operation is dependent upon the se-

quence and polarity of the permutation impulses, two groups of condensers therefor, and means for operating said groups of condensers alternately.

11. In a printing telegraph system wherein the characters are represented by permutations of line current impulses, the combination with a current distributer, a selecting mechanism associated therewith, a plurality of sets of condensers connected to said distributer, and means controlled by the said distributer for connecting said sets of condensers alternately to said selecting mechanism.

12. In a printing telegraph system, the combination with a main line, of a current distributer for distributing the line current impulses, groups of condensers for storing said impulses, selecting mechanism, and means for discharging said groups of condensers alternately through said selecting mechanism to effect their operation.

13. In a printing telegraph system, the combination with a main line, of a current distributer for distributing the line current impulses, a plurality of circuits connected to said distributer, condensers in said circuits, a local source of current for charging said condensers, selecting magnets, windings therefor, and means controlled by said distributer for causing said charged condensers to discharge through the windings of the selecting magnets to effect their operation.

14. In a printing telegraph system wherein the characters are represented by permutations of impulses, the combination with a current distributer, groups of signal storing means connected to said distributer, means for storing the effects of the line current impulses in said storing means, selecting mechanism, and means for causing the stored signals to effect the operation of the selecting mechanism while a subsequent group of current impulses is being stored in another group of signal storing means.

15. In a printing telegraph system wherein the characters are represented by permutations of impulses, the combination with a current distributer, a plurality of groups of condensers connected thereto for storing the effects of the line current impulses, selecting magnets, windings therefor, and means controlled by the said distributer for causing one of said groups of condensers to discharge through the windings of the selecting magnets while the subsequent group of line current impulses is being stored in another group of condensers.

16. In a printing telegraph system wherein the characters are represented by permutations of impulses, a current distributer for distributing the line current impulses, a plurality of groups of condensers associated with said distributer for the storage of the line current impulses, means for charging said groups of condensers alternately, selecting magnets, windings therefor, and means for causing said groups of condensers to discharge alternately through the windings of the selecting magnets.

17. In a printing telegraph system, the combination of a main line, a polarized relay connected in said line, a current impulse distributer for distributing the effects of the line current impulses, groups of condensers associated with said distributer, a local source of current for charging said condensers in accordance with the polarity of the line current impulses, selecting magnets, and switching mechanism controlled by said distributer for connecting said groups of condensers alternately to the selecting magnets.

In witness whereof, I hereunto subscribe my name this 24th day of August, A. D. 1917.

JOHN HUME BELL.