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PRINTING TELEGRAPH APPARATUS

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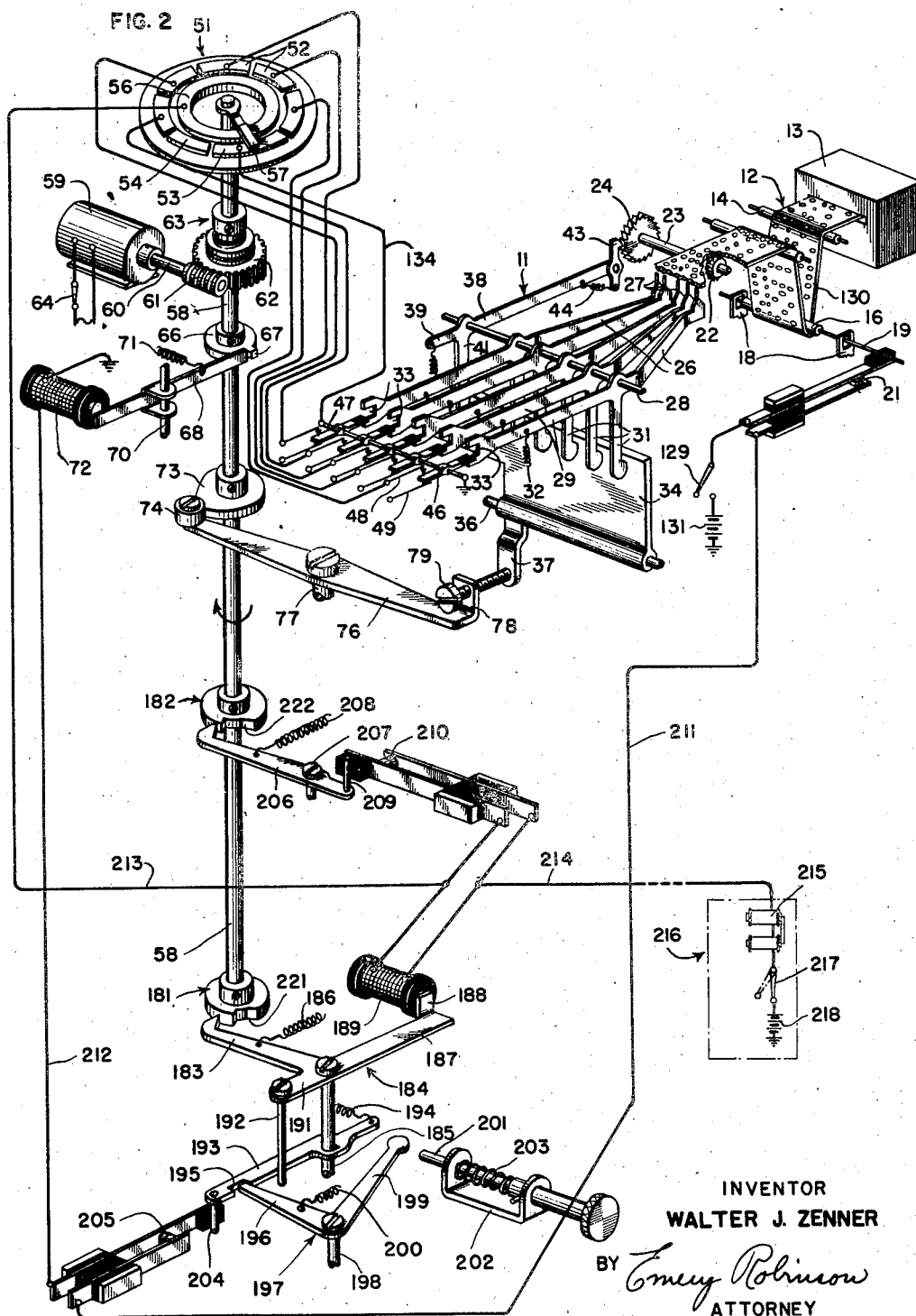
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PRINTING TELEGRAPH APPARATUS

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This invention pertains to printing telegraph apparatus and more particularly to transmitter control mechanism.

The primary object of the present invention is to provide a device for automatically arresting transmission of signals from a transmitter distributor upon the opening of the signal line circuit.

Another object of the invention is to provide a "break-lock" mechanism which is effective upon the opening or "breaking" of the signal line circuit to arrest transmission of code signals from the transmitter distributor apparatus.

Specifically, the invention is applicable to communicating apparatus of the combination sending-receiving type, which is designed for interchanging messages between two or more points, and which consists of a tape transmitting unit and a combination printer-reperforator unit. In handling telegraph communications it sometimes becomes necessary for the operator at the receiving station to communicate with the operator at the sending station, and it is often very important that the receiving operator be enabled to interrupt the operation of the transmitting apparatus. This interruption by the receiving operator is known in telegraphy as "breaking" or operating "break-in" signals.

In the arrangement according to the present invention, a perforated tape is prepared upon a reperforator, after which the tape is directed to a tape transmitter distributor, from which the message perforated in the tape is transmitted over the signal line to the remotely located printer. If the receiving operator is desirous of interrupting this transmission, he will open or "break" the line, so that a break-lock mechanism in said transmitter will be operated to stop transmission and to simultaneously close an alarm circuit, whereby the sending operator is apprised of the interruption so that he can thereby prepare his apparatus for reception of the urgent message, and thereafter prepare his machine for retransmission of the received message, the interrupted message, or any other intelligence.

A more complete understanding of the foregoing and other objects and features of the present invention may be had from the following description when taken in conjunction with the accompanying drawings, in which

Fig. 1 is a schematic arrangement of one embodiment of the present invention; and

Fig. 2 is a schematic arrangement of a modified form of the invention.

Having reference to Fig. 1, the tape sensing

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unit which is designated generally by the numeral 11 receives the tape 12 from a tape perforating apparatus 13, many types of which are well known in the art. The tape sensing unit and transmitting unit are described only to an extent necessary to understand the present invention and may be understood more fully by referring to Bulletin 141, issued in March, 1942, by the Teletype Corporation, Chicago, Illinois, wherein they are described substantially.

The tape 12 passes over a guide roller 14, moves downwardly and under a taut-tape roller 16 which will be mentioned later, and forms in a loop and passes over a guide roller 17 which is in a horizontal plane with the previously mentioned guide roller 14. The taut-tape roller 16 is supported in two slotted guides 18 and has an outwardly extending arm 19 which controls an electrical contact pair 21, as will be hereinafter described. The tape 12 then passes over a sprocket wheel 22 which is fastened securely to a shaft 23 and which has teeth thereon to engage in the perforated feed holes in the tape 12 and thus feed the tape through the sensing mechanism. The shaft 23 has a ratchet 24 secured to one end thereof by means of which the tape feed operation is effected, as will be later explained.

Immediately after the tape 12 passes from the sprocket 22 it passes over a set of five contact levers 26 each of which has a tape sensing pin 27 extending upwardly from its forward end. The tape sensing pins 27 are adapted under certain operating conditions to probe upwardly to sense the tape in order to determine whether the particular code signal being sensed is comprised of marking or spacing impulses, in a manner well known in the art. The contact levers 26 are pivoted on a shaft 28, each having leftwardly extending arms 29 and downwardly extending arms 31. Each of the contact levers 26 has an individual spring 32 which is connected to the leftwardly extending arm 29 and tends to rotate the contact levers 26 in a counterclockwise direction about the pivot shaft 28, as viewed in Fig. 1. Each of the leftwardly extending arms 29 of the contact levers 26 has an open ended slot 33 formed at its extremity.

Positioned approximately below the shaft 28 is a contact lever bail 34 which is immediately to the right of the downwardly extending arms 31 of the contact levers 26 and extends across all of the arms 31. The bail 34, mounted pivotally on a pivot shaft 35, has a downwardly extending lug 37.

Also mounted pivotally on the shaft 28 is a feed lever 38 which has a leftwardly extending

arm 39 and a downwardly extending arm 41. A spring 42 is connected to the arm 39 and tends to pivot the feed lever 38 in a counterclockwise direction about shaft 28, as viewed in Fig. 1. The feed lever 38 has a feed pawl 43 mounted pivotally at its rightward extremity, which has a spring 44 connected to a downwardly extending lug thereon and which tends to pivot the feed pawl in a clockwise direction.

The feed pawl 43 is situated adjacent to the ratchet wheel 24 and cooperates therewith during certain operating conditions to cause the tape 12 to be fed forwardly. The bail 34, described previously as extending across the downwardly extending arm 31 of the contact levers 26, also extends across the downwardly extending arm 41 of the feed lever 38.

Situated immediately to the left of the slots 33 at the extremities of the rearwardly extending arms 29 of the contact levers 26 are a series of five contact arms 46, one individual to each contact arm 26, which are mounted pivotally on an electrical conductor shaft 47. The right-hand ends of the contact arms 46 which cooperate with the slots 33 are insulated, whereas the remaining portions of the contact arms are electrical conductors. The opposite ends of the contact arms 46, remote from the insulated portion cooperating with the slots 33, form a movable tongue to cooperate with an upper electrical spring contact 48 or a lower electrical spring contact 49. Thus, depending upon the position of the contact arms 46 an electrical contact will be made with either the upper spring contact 48 or the lower spring contact 49, in a manner to be hereinafter described.

The transmitting unit comprises a commutator 51 formed with five equal size segments 52 thereon, each of which is assigned to one impulse of the well-known Baudot five unit code. Two other segments are provided on the commutator face other than the five segments 52, one of which, 53, is assigned to the stop interval while the other, 54, is assigned to the start interval. Thus, the transmitting apparatus is of the start-stop type, the operation of which is well known. A collector ring 56 is provided which is formed in a complete circle concentric to the ring of segments and which is electrically connected successively therewith by means of a distributor brush 57 which is mounted securely to a distributor shaft 58 to rotate therewith.

A motor 59 is provided having a worm 61 on the motor shaft 60 which cooperates with and continuously drives a gear wheel 62 positioned about the distributor 58. The distributor shaft is, in turn, driven through a friction clutch 63 cooperating with gear 62 in a well-known manner. A switch 64 is provided which completes an electrical circuit from an alternating current source to drive the motor 59; obviously, a direct current source may also be used.

Positioned securely to the distributor shaft 58 is a disc 66 which has a stop lug 67 extending therefrom. The stop lug 67 engages, during certain periods of operation, with the end of a stop arm 68, which is pivotally mounted on a shaft 70 and which is normally biased in a counterclockwise direction into engagement with the stop lug 67 by means of a spring 71. The opposite end of the stop arm 68 forms an armature for a magnet 72.

An operating cam 73 is also secured to the distributor shaft 58 and cooperates with a cam follower roller 74 which forms one end of a

transmitter operating lever 76 pivotally mounted on a stud 77. The opposite end of the transmitting operating lever 76 has an upwardly extending portion 78 which has an adjusting screw 79 passing therethrough. The adjusting screw 79 is immediately adjacent to the downwardly extending arm 37 of the contact lever bail 34, previously described, and cooperates therewith in a manner to be explained.

The various parts which have been described above are all well known equipment and are substantially described in the above-mentioned bulletin issued by the Teletype Corporation. However, it is necessary to describe them herein inasmuch as they form part of the present invention, as will now be set forth.

To achieve the objects of the present invention there are also mounted on shaft 58 timing cams 81 and 82 which, upon the occurrence of a break in the line, for example, upon the opening of a switch 139 at the remote station 138, control the stopping of the transmitter in such a manner to insure the completion of the code signal combination being then transmitted. Cooperatively associated with cam 81 is one end of a lever 83 pivotally mounted on a pivot 84. Lever 83 is normally biased in a clockwise direction by a spring 86 to maintain its left end (Fig. 1) in contactual relation with the periphery of cam 81. The opposite end of lever 83 provides an armature for a magnet 87 suitably mounted in the transmitter apparatus.

Lever 83 is provided, near its left end, with a slot 88 which accommodates slidably therein a slidable member 89. Member 89 is provided with a shouldered portion 91 having a step or shoulder 92 which cooperates under certain operating conditions, presently described, with the right end of slot 88. Member 89 is slidably supported by a bracket 93, and is further provided with a laterally directed shoulder 94 which abuts against bracket 93 when slide member 89 is biased rightwardly by a spring 95 and acts as a limiting stop for the rightward movement of member 89, as well as a pivot point, as will presently appear. Attached to the right end of slide member 89 is a vertically directed stud 96 which cooperates with the insulated end 97 of a contact bank 98 comprising a normally closed contact pair 99 and a normally open contact pair 101.

The left-hand end of slide 89 (as viewed in Fig. 1) cooperates with the vertically extending portion 102 of arm 103 of lever 104 pivotally mounted on a pivot 105. Lever 104 is provided with a cam follower arm 106 which cooperates with the periphery of cam 82. A spring 107 normally biases lever 104 in a counterclockwise direction to bring arm 106 against the periphery of cam 82. Lever 104 is also provided with a downwardly directed portion 108 which cooperates with a normally closed contact pair 109.

The operation of the device according to the present invention and its cooperation with the tape sensing and transmitting apparatus, and the electrical circuits therefor, will now be described.

Upon the manual closing of switch 64 a circuit is completed from the current source to cause the operation of the motor 59 which results in rotation of the worm 61 on the motor shaft and a consequent rotation of the gear 62 about the distributor shaft 58. However, at this time the distributor shaft 58 will not rotate, inasmuch as the stop arm 68 is engaging the stop lug 67 and preventing rotation thereof. Such non-rotation of

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the distributor shaft 58 is possible because of the friction clutch 63. The distributor brush is at this point on the stop segment 53 of the commutator 51 which is customary in start-stop telegraphy. Upon the manual closure of switch 129, assuming that there is sufficient tape 12 in loop 130 to allow the tape-roller 16 to be in a downward position with its arm 19 closing the contact pair 21, potential will be supplied from grounded battery 131 through the switch 129, through the contact pair 21 which is closed, over conductor 132, through normally closed contact pair 99, over conductor 133 and through winding of magnet 72 to ground.

Magnet 72 will upon its energization, cause lever 68 to rotate about its pivot 70 against the action of spring 71 to remove the extremity of its rightward arm from blocking engagement with stop lug 67 on stop disc 66, thus initiating rotation of shaft 58 and the several elements attached thereto. Cam 73 upon rotating causes lever 76 to oscillate (follower roller 74 being held against cam 73 by springs 32) to in turn impart oscillation to bail 34. As the bail 34 oscillates, the sensing levers 26 are cyclically actuated to sense the code combinations appearing in the tape 12. The setting of the levers 26 permutably in accordance with code perforations sensed in the tape is transferred to the contacts 48 and 49 through the instrumentality of rockers 46.

When the shaft 58 is in its stop position, as shown in Fig. 1, the distributor brush 57 is on the stop segment 53 of the commutator 51 which is customary in start-stop telegraphy. During this condition of operation the line circuit is completed from ground, through shaft 47, over conductor 134, then either through the winding of magnet 87 or through shunting contacts 109 (depending upon the condition of operation), then over conductor 135, through segment 53, over brush arm 57, through ring 56, over line conductor 136, through the receiving magnet 137 of remote station 138, through switch 139 and to grounded battery 141. As the brush arm 57 rotates during signal transmission, it traverses in turn the start segment 54 and the code impulse segments 52, completing its code cycle by again contacting the stop segment 53. The segments 52 are connected to the contacts 48, so that as the contacts 48 or 49 are closed simultaneously during each sensing operation according to the code combination sensed, the impulses are transmitted over the line conductor, to station 138, sequentially.

Cams 81 and 82 are so conformed with notches 85 and 90, respectively, that magnet 87 is energized during substantially the latter half of the stop impulse and short circuited through closed contact pair 109 during the remainder of the signal cycle and in the stop position of the transmitter distributor, which occurs during the first portion of the stop segment 53. Thus in the case of several transmitter distributors connected in the line with but one distributor transmitting, the inductance and resistance of the magnets 87 (or magnets 139 in Fig. 2) of the units not transmitting will not be reflected in the line or local circuit as the case may be. Also, in the case of a single transmitter distributor in the line in the stop position or transmitting (when it is desired to prevent the transmitter from responding to a "break" signal) its break-lock magnet is not in the line or local circuit. Of course, the cam notches could be positioned so that the magnet 87 would be energized during the first portion of

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the stop segment, but for purposes of the present disclosure the timing has been chosen so that the magnet 87 is energized immediately after the initiation of the signal cycle. Moreover, if the line circuit is opened or "broken" at switch 139 or any other point during the transmission of a code signal, the "break" will not be effective to stop the operation of the transmitter until the instant code signal (signal being transmitted) has been completely transmitted, as will presently appear.

While shaft 58 is rotating continuously during normal transmission and the notch 85 in cam 81 passes the left end of lever 83 cyclically, the end of lever 83 will not fall into notch 85 because at that time (which is during the stop period) the contact pair 109 opens, due to coaction between arm 106 and notch 90, to remove the shunt around magnet 87, thus permitting magnet 87 to operate to hold lever 83 in its counterclockwise position. However, if a "break" occurs in the line circuit, thus causing the line to be opened, the magnet 87 will not become energized during the stop period, when contact pair 109 is opened, as no battery will be applied from distant station 138, so that then the lever 83 will respond to the pull of spring 86 when the notch 85 registers with the end of lever 83, thus permitting the end of said lever to fall into said notch.

Under this condition of operation, the left arm of lever 83 will be moved counterclockwise so that slot 88 will engage the shoulder or step 92 due to the action of spring 95 on slide 89, spring 95 acting to rotate slide 89 in a counterclockwise direction about shoulder 94 as a pivot. Then, when the high portion of cam 81 again cooperates with the left end of lever 83 to rotate lever 83 counterclockwise the slide 89 will be urged leftwardly (as viewed in Fig. 1) to open contact pair 99 and close contact pair 101. The opening of contact pair 99 causes magnet 72 to become deenergized to effect the stopping of shaft 58, as the battery 131 will be cut out of the magnet circuit. The closing of contact 101 completes an energizing circuit for signal lamp 100 (or any other form of alarm) from battery 195 over an obvious circuit through now closed contact pair 101.

The transmitter remains in its stopped position until slide 89 is released by a push rod 142 which is slidably mounted in brackets 143 and 144 suitably mounted to the transmitter frame. A spring 145 surrounding rod 142 normally urges rod 142 rightwardly, out of engagement with slide 89. Rod 142 is provided with a sidewardly extending pin 146 which is normally blocked by a shoulder 147 on a bracket 148. If it is desired to prevent the transmitter from responding to a "break" signal the push rod 142 is turned to release pin 146 from lug 147 and is positioned so that pin 146 engages a slot 149 also in bracket 148.

As previously described, lever 104 is provided with an arm 102 which cooperates with slide 89. Thus, when rod 142 is depressed to bring pin 146 into engagement with slot 149, said rod 142 will, through the interposition of slide 89 and arm 102, cause lever 104 to rotate clockwise against the action of spring 107, thereby maintaining contact pair 109 closed. Manifestly, under this condition of operation, the magnet 87 remains shunted at all times.

Modification

A modified form of the invention is shown in Fig. 2, in which corresponding elements are cor-

respondingly numbered. Only the additional elements will be described hereinafter, recourse being had to the principal embodiment for a description of the tape sensing and transmitter portion.

Mounted on shaft 58 are a pair of cams 181 and 182, corresponding respectively to cams 81 and 82 of the embodiment shown in Fig. 1. Cooperatively associated with cam 181 is one arm 183 of a three-armed lever 184 pivotally mounted on a pivot shaft 185. Lever 184 is normally biased in a clockwise direction by a spring 186 to maintain the cam follower extremity of arm 183 in contactual relation with the periphery of cam 181. Arm 187 of lever 184 terminates in an armature portion 188 which cooperates with a magnet 189 suitably mounted in the transmitter apparatus.

Lever 184 is also provided with an arm 191, to the extremity of which is secured a depending stud 192 which cooperates with a lever 193 also pivotally mounted on pivot shaft 185. Lever 193 is normally urged in a counterclockwise direction about shaft 185 by a spring 194. Lever 193 is provided with a notch 195 which cooperates with arm 196 of a bell crank lever 197 pivotally mounted on a pivot 198. The other arm 199 of lever 197 cooperates with a push rod 201 which is slidably mounted in a bracket 202. A spring 203 normally urges the push rod 201 rightwardly (as viewed in Fig. 2). A depending stud 204 is mounted at the end of the lever 193 and cooperates with a contact pair 205 included in the circuit for the stop magnet 72.

Associated with cam 182 is a lever 206 pivoted at 207, and which is normally biased in a clockwise direction by a spring 208 to urge its cam follower extremity constantly into contactual engagement with the periphery of cam 182. The opposite extremity of lever 206 is provided with a stud 209 which cooperates with a contact pair 210 included in the signal line to provide a shunt for the magnet 189.

The operation of the modified form of the present invention will now be described. Upon the manual closing of switch 64, the circuit for motor 59 will be completed, thereby tending to apply power to shaft 58 through friction clutch 63. Shaft 58 is held against rotation by the engagement of stop arm 68 with stop lug 67. Upon the manual closure of switch 129, potential will be supplied to start magnet 72 over a circuit extending from grounded battery 131, through switch 129, through contact pair 21, over conductor 211, through contact pair 205, over conductor 212, and through the winding of magnet 72 to ground. Magnet 72 will, upon energization, attract lever 68 to release the shaft 58 for rotation.

When the shaft 58 is in its stop position, as shown in Fig. 2, the distributor brush 57 is on the stop segment 53 of the commutator 51 and the signal line circuit is completed from ground through shaft 47, over conductor 134, through segment 53, over brush 57, through ring 56, over conductor 213, then either through the winding of magnet 189 or through the shunting contact pair 210 (depending upon the condition of operation, as will presently appear), over line conductor 214, through the receiving magnet 215 of remote station 216, through switch 217, and to grounded battery 218. As the shaft 58 rotates, code signals are transmitted over the line circuit in the manner already described in connection

with the principal embodiment of the invention.

In a manner similar to that described in Fig. 1, cams 181 and 182 are provided with depressions 221 and 222, respectively, so disposed or related that magnet 189 is energized during substantially the latter half of the stop impulse and short circuited during the remainder of the signal cycle, for reasons previously mentioned. The timing cam 181 is so designed that should a line "break" occur, upon the opening of switch 217 or otherwise, the code signal being transmitted at the time of the "break" will not be mutilated. In other words, irrespective of when the line "break" occurs, the brush arm 57 will always be brought to rest on the stop segment.

While shaft 58 is rotating constantly during normal transmission and the depression 221 in cam 181 cyclically passes the follower end of arm 183 of lever 184, said end of arm 183 will not fall into the depression 221 because at that time (which is during the stop period), the contact pair 210 opens, due to the coaction between the arm of lever 206 and depression 222 of cam 182, to remove the shunt around magnet 189, thus permitting magnet 189 to energize to hold lever 184 in its counterclockwise position. However, if a "break" occurs in the line circuit, thus causing the line to be opened, the magnet 189 will not become energized during the stop period, when contact 210 is opened, because battery will no longer be supplied thereto from distant station 216, so that then the lever 184 will respond to the pull of spring 186 when the notch 221 registers with the end of lever arm 183, thus permitting the end of said lever to fall into said notch.

Under this condition of operation, the lever 184 will be actuated in a clockwise direction so that stud 192 will cause lever 193 to rotate also in a clockwise direction against the action of spring 194 to effect the disengagement of the end of arm 196 of bell crank lever 197 from the notch 195 thereby permitting the bell crank 197 to respond to the pull of its spring 200. Arm 196 of lever 197 will thus block the lever 193 in its clockwise position, and stud 204 on lever 193 will hold the contact pair 205 open to thereby open the energizing circuit for the stop magnet 72. The transmitter will thus be stopped and will remain in its stopped position until lever 193 is released by arm 196 of bell crank 197. This release is effected by depressing the push rod 201 to cause the bell crank 197 to be rotated counterclockwise whereby the end of lever arm 196 will again enter the notch 195, permitting the lever 193 to rotate sufficiently in a counterclockwise direction, to allow contact pair 205 to close.

It is understood, of course, that in the arrangements shown, the magnet 189 could be connected as shown in Fig. 1, or the magnet 87 could be connected as shown in Fig. 2. With the arrangement shown in Fig. 1, the break-lock magnet and/or its short circuiting contact are in the line circuit only during the stop interval, while in Fig. 2, the break-lock magnet and/or its short circuiting contact are in the line circuit during all of the impulse intervals.

Although certain specific embodiments of the present invention have been shown and described herein, it is to be understood that the invention is not limited to such embodiments, but is capable of modification, rearrangement, and substitution of parts and elements without departing from the spirit of the invention, and within the scope of the appended claims.

What is claimed is:

1. In a communication system, a rotary distributor of the start-stop type for generating signals, a break-lock means comprising timing instrumentalities for controlling the operation of said distributor, said means effective in response to a predetermined condition of the signal line, and means at a remote station for producing said predetermined condition to render said break-lock means effective in timed relation to said signals.

2. In a communication system, a rotary distributor of the start-stop type, a break-lock means for controlling the operation of said distributor, said means effective in response to a predetermined condition of the signal line, cam means for timing the operation of said break-lock means, and means at a remote station for producing said predetermined condition.

3. In a communication system, a rotary distributor of the start-stop type, electromagnetic means for controlling said distributor, said means controlled by a local source of current, a break-lock means for controlling the operation of said electromagnetic means, said break-lock means embodying a magnet normally included in the signal line circuit and effective in response to a predetermined signaling condition, and means at a remote station for producing said predetermined signaling condition.

4. In a communication system, a rotary distributor of the start-stop type, electromagnetic means for controlling said distributor, said means controlled by a local source of current, a break-lock means for controlling the operation of said electromagnetic means, said break-lock means comprising a magnet normally included in the signal line circuit and effective in response to a predetermined signaling condition, cam means for timing the operation of said break-lock means, and means at a remote station for producing said predetermined signaling condition.

5. In a control device, signal generating means, electromagnetic means for controlling said signal generating means, said electromagnetic means controlled by a local source of current, means included in the signal line circuit and effective in response to a predetermined signaling condition, lever means controlled by said last recited means for controlling the effectiveness of said electromagnetic means, and cam means for timing the operation of said lever means.

6. In a communication system, a rotary distributor of the start-stop type, electromagnetic means for controlling said distributor, said means controlled by a local source of current, a break-lock means for controlling the operation of said electromagnetic means, said break-lock means comprising a magnet normally included in the signal line circuit and effective in response to a predetermined signaling condition, means for normally shunting the circuit through said magnet, cam means for timing the operation of said shunting means to render said break-lock means effective to stop said distributor, and means at a remote station for producing said predetermined condition.

7. In a control device, signal generating means,

electromagnetic means for controlling said signal generating means, said electromagnetic means controlled by a local source of current, means included in the signal line circuit and effective in response to a predetermined signaling condition, a lever arrangement controlled by said last recited means for controlling the effectiveness of said electromagnetic means, means for normally shunting the circuit through said magnet, and cam means for timing the operation of said shunting means to render said break-lock means effective to stop said distributor.

8. In a communication system, a rotary distributor of the start-stop type, electromagnetic means for controlling said distributor, said means controlled by a local source of current, a break-lock means for controlling the operation of said electromagnetic means, said break-lock means including a magnet normally inserted in the signal line circuit and effective in response to a predetermined signaling condition, means at a remote station for producing said predetermined condition, and means to render said brake-lock means ineffective.

9. In a communication system, a segmental distributor of the start-stop type for transmitting signals comprising a predetermined number of signal impulse intervals, electromagnetic means for controlling said distributor, said means controlled by a local source of current, a break-lock means for controlling the operation of said electromagnetic means, said break-lock means comprising a magnet normally connected to one only of the segments of said distributor and effective in response to the connection of said segment to the line pursuant to a predetermined signaling condition, cam means for timing the operation of said break-lock means, and means at a remote station for producing said predetermined condition.

10. In a communication system, a rotary distributor having a start segment, a stop segment and a plurality of code segments, a brush associated with said distributor, means for rotating said brush, a break-lock means for controlling the operation of said distributor, means for conditioning said break-lock means as said brush traverses said stop, start, or code segments of said distributor, and means to permit the operation of said conditioned break-lock means only when said brush arm is on said stop segment.

11. In a communication system, a rotary distributor of the start-stop type, electromagnetic means for controlling said distributor, said means controlled by a local source of current, a break-lock means for controlling the operation of said distributor, said break-lock means including a magnet normally inserted in the signal line circuit and effective in response to a predetermined signaling condition, means at a remote station for producing said predetermined condition, cam means for timing the period of effectiveness of said remote means to render said break-lock means effective to stop said distributor, and means dually effective to render said break-lock means and said timing means ineffective.

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