

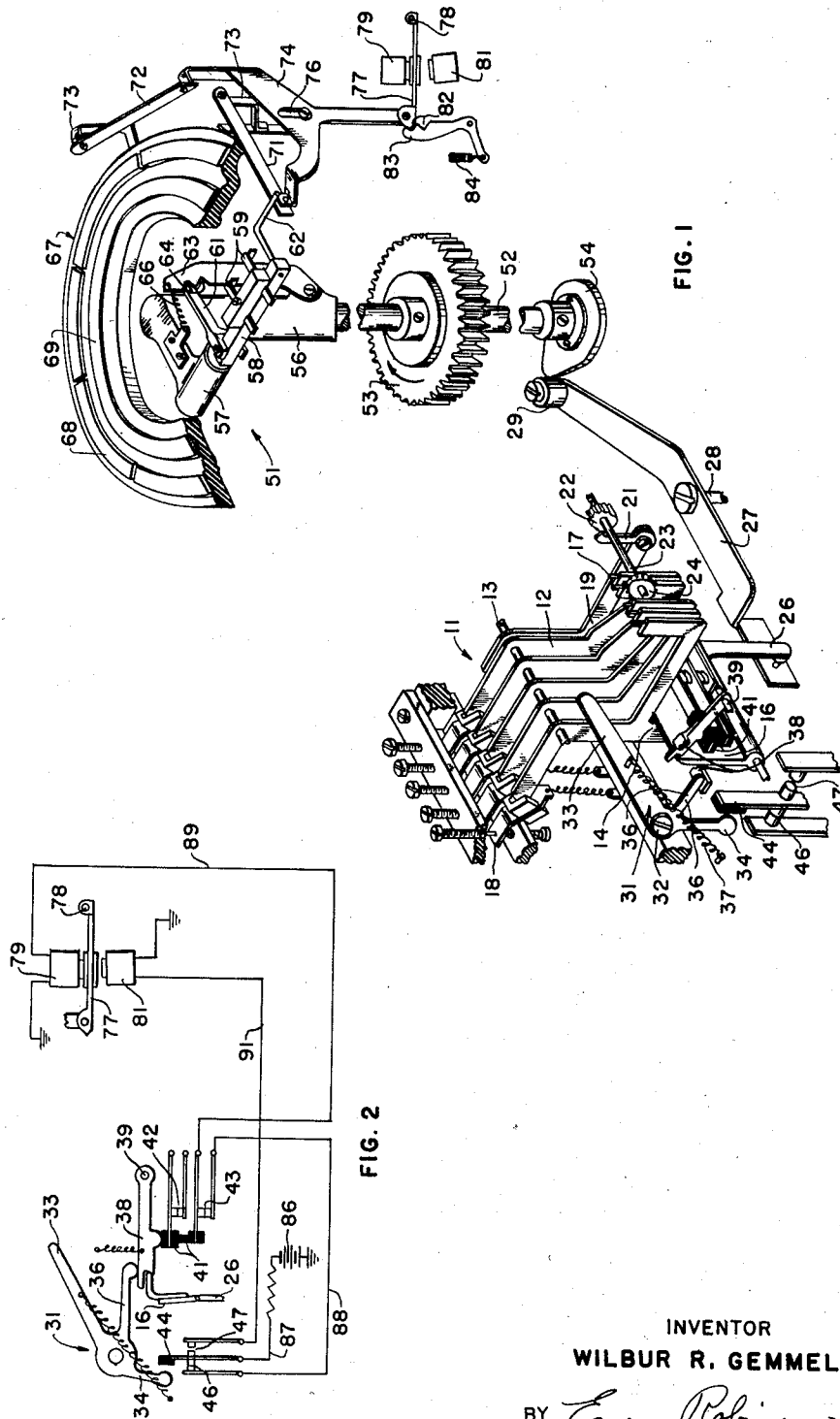
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DISTRIBUTOR BRUSH CONTROL APPARATUS

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DISTRIBUTOR BRUSH CONTROL
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The present invention relates to distributors, and more particularly to means for lifting the brushes from the distributor.

The invention is adapted particularly for use with telegraph apparatus, especially with transmitter distributors of the mechanical type.

As the speed of telegraph transmission has increased, particularly in the start-stop variety, it has become expedient to eliminate the clutch controlling the stopping and starting of the distributor arm and to supplant it with a send-stop lever associated with the usual tape sensor which locks the operating bail and prevents the tape from being sensed or fed. In this way transmission may be halted when desired. However, under this condition the distributor arm will continue to rotate, even though no tape is being sensed, resulting in needless wear on the distributor brushes.

Accordingly, it is an object of the present invention to provide means for lifting the distributor brushes from the distributor.

It is a further object of the present invention to provide means to lower the brushes to engagement with the distributor from the raised position.

A still further object of the present invention is to provide means for automatically lifting the distributor brushes when a telegraph transmitter is disabled, and for automatically lowering them to engagement with the distributor when the telegraph transmitter is released for operation.

The invention, in general, comprises means associated with a continuously rotating distributor for automatically lifting the brushes from engagement therewith, and means for automatically lowering the brushes from the raised position to engagement with the distributor. Means are also provided to retain the brushes in either their raised or lowered positions.

The invention will hereinafter be illustrated and described in conjunction with a telegraph transmitter. However, it is to be understood that such is but one application of its use, and that the invention is not limited thereto. For instance, it could be associated with a telegraph receiver, as well as apparatus used in other than the telegraph field.

The features and advantages of the present invention will become apparent from the following detailed description when read in conjunction with the accompanying drawing, in which

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showing the apparatus embodying the invention in conjunction with a telegraph sensing and transmitting device, and

Fig. 2 is a diagrammatic electrical circuit embodied in the invention.

With reference to Fig. 1 of the drawings, the telegraph transmitter apparatus includes a tape sensing unit indicated generally by the numeral 11, which comprises five tape sensing members 12 pivoted on a shaft 13 and each having downwardly extending portions 14 which are under the control of a common bail 16. As is well known in the art, the tape sensing members 12 are provided with pins 17 at their forward extremity which enter perforations in the previously prepared tape when the sensing members 12 are allowed to pivot in a counterclockwise direction under the control of the bail 16. In accordance with the movement of the sensing members 12 a pivoted contact 18 associated with each member 12 moves between an upper and a lower contact point resulting in a marking or spacing impulse being transmitted, as is also well known in the art.

A sixth lever 19 is also pivoted about the rod 13 and has a downwardly extending arm, which is not shown, but which is under the control of the bail 16 similarly as the members 12. The sixth lever 19 is provided at its forward extremity with a pawl 21 which engages a ratchet 22 on a shaft 23 which in turn supports a tape feed sprocket 24. As the bail 16 moves in accordance with its customary operation the lever 19 will operate to cause the pawl 21 to step the ratchet 22, thus rotating the shaft 23 and the sprocket 24, to step the tape between individual lines of perforations.

The bail 16 has a downwardly extending arm 26 which is adjacent to and under the control of an operating lever 27 mounted pivotally at 28 and controlled by a cam follower 29, in a manner which will be described hereinafter.

A send-stop lever 31, mounted pivotally at 32, comprises an operating handle 33, a downwardly extending arm 34 and a forwardly extending arm 36. An overthrow spring 37 is provided to retain the lever 31 in its send or in its stop position. The forwardly extending arm 36 overlies and controls a locking lever 38 which is mounted pivotally at 39 and which, when in its counterclockwise position, engages the upper surface of the bail 16 and precludes the bail from moving forwardly (clockwise) to allow the sensing members 12 to present their pins 17 upwardly to the tape. The locking lever 38 controls two pairs of elec-

Fig. 1 is a perspective view, partly broken away,

trical contacts 42 and 43 by causing the operation of common insulating members 41, as will be described hereinafter.

The downwardly extending arm 34 of lever 31 controls a movable swinger 44 which causes the closing of one or the other of two contact pairs 46 and 47.

A more complete description of the above apparatus and its operation, with the exception of the contact pairs 42, 43, 46, and 47 may be had by reference to Patent No. 2,418,928, issued on April 15, 1947, in the name of W. R. Gemmel, or by reference to Bulletin No. 1119, copyrighted in March of 1944, by the Teletype Corporation, Chicago, Illinois.

The distributor associated with the tape sensing unit 11 is indicated generally by the numeral 51 and includes a shaft 52 having a gear 53 which is driven by a suitable motor, not shown, in order to impart clockwise rotation to the shaft 52. At the lower extremity of the shaft 52 is a cam 54 which is adjacent to and engages the follower roller 29 previously mentioned to control the operation of the operating lever 27 about its pivot point 28.

The shaft 52 is provided at its upper extremity with a brush holder bracket 56 which is secured to the shaft in such a manner as to rotate therewith and which has a portion 57 provided with a cylindrical opening therein. A brush holder 58 is mounted rotatably in the hollow opening in the brush holder bracket 57 and is provided with a pair of brushes 59 extending therefrom. The brush holder 58 is also provided with an arm 61 and an extension 62 formed in a right angle. Adjacent the pointed end of the arm 61 is a detent 63 having a pair of notches 64 therein which engage the end of the arm 61 and tend to hold it in one of the two notches 64 by means of a biasing spring 66.

The brushes 59 are provided for traversing a face plate indicated generally by the numeral 67 and which comprises a segmented ring 68 and a solid ring 69 secured thereon, in a manner and for a purpose well known in the telegraph art.

Positioned adjacent to the face plate or distributor disc 67 is a cam-up lever 71 and a cam-down lever 72 both of which are pivotally secured at one end to separate stationary brackets 73 and at the other end to separate upstanding lugs of a common slide 74. The common slide 74 is provided with an oblong slot 76 therein and has pivoted to its lower extremity an armature 77 which may move about its pivot point 78 depending on which of the magnets 79 or 81 is energized. The armature 77 has a forwardly extending V-shaped point which cooperates with one of two notches 82 in the face of a detent 83 which is biased by a spring 84.

When the described apparatus is operating normally the send-stop lever 31 will be in its counterclockwise position, contrary to the position shown in the drawing. At this time the locking lever 38 will be pivoted clockwise about its pivot 39 thus not engaging the upper edge of the bail 16, all as described in my above-identified patent. Under this condition, the bail 16 is free to operate through the engagement of the operating lever 27 with the bail lug 26, all under the control of the cam 54 and cam follower 29, in a manner as is well known, and which provides that during the movement of the outer brush 59 over the stop segment of the segmented ring 68 the tape sensing members 12 will be withdrawn from engagement with the tape under the control

of the bail 16. The tape will be stepped through the operation of the tape feed sprocket 24 and as the outer brush 59 traverses the start segment of the segmented ring 68 the sensing pins 17 will be allowed to probe for perforations in the tape. Thereafter, as the brushes 59 traverse the five code segments of the ring 68, five unit permutation code impulses will be transmitted over a line conductor to a distant station.

In describing hereinafter the operation of the apparatus embodying the invention it will be assumed that the apparatus is operating as just described with the send-stop lever 31 in its counterclockwise or "send" position.

It will now be assumed that it is desired to stop transmission from the instant apparatus and in accordance therewith the lever 31 is pivoted manually to its clockwise position as is shown in the instant drawing, which results in the arm 36 causing the locking lever 38 to engage the bail 16 during the stop segment, as described in the above-mentioned patent, and preclude further operation of the sensing levers 12 in their clockwise position with the pins 17 down out of the tape. By reference to Fig. 2 it may be seen that upon the movement of the lever 31 to its "stop" position the common insulators 41, under the control of the locking lever 38, will cause the contact pairs 42 and 43 to be closed. Likewise, such movement being imparted to the lever 31 will allow the downwardly extending arm 34 to move out of engagement with the contact swinger 44 thus allowing it, through its inherent resilience, to move to a position to close the contact pair 46.

Under these conditions an electrical circuit, Fig. 2, may be traced from grounded battery 86, over a conductor 87, through the movable swinger 44, through the closed contact pair 46, over a conductor 88, through the closed contact pair 43, over a conductor 89, and through the winding of the magnet 79 to ground. Such will result in the armature 77 being attracted by the energized magnet 79, moving about its pivot point 78 in a clockwise direction, resulting in the common slide 74 being moved to its upward position as is illustrated in Fig. 1 of the drawings. Upon the upward movement of the common slide 74 its upwardly extending lugs will be moved likewise, resulting in the cam-up lever 71 being pivoted in a clockwise direction about its pivotal mounting to stationary bracket 73 and the cam-down lever 72 likewise being moved upwardly or in a clockwise direction about its pivotal mounting to stationary bracket 73. Upon upward movement of the slide 74 the pointed extremity of the armature 77 will engage in the upper notch 82 of the detent 83 resulting in the armature and slide being held in that notch under the urging of the spring 84.

As was previously mentioned, the send-stop lever 31 moves to its maximum clockwise position to cause the locking lever 38 to lock the bail 16 as the distributor brushes 59 traverse the stop segment of the segmented distributor ring 68, irrespective of the time that the arm 33 is moved in a clockwise direction. Thus, it should be noted that even though the arm 34 allows the movable swinger 44 to open contact pair 47 and close contact pair 46 at movement of the arm 33 the magnet 79 will not be energized until the stop segment is reached at which time contact pair 43 will be closed. The slide 74 will not be affected at this time, even though magnet 81 de-energizes, due to the opening of the contact pair 47, as the detent 83 holds the armature

77 as previously positioned. Likewise, the shunting contact pair 42 will not be closed until the stop segment is traversed. In this manner the apparatus will continue to function to transmit a complete signal, or until the stop segment is traversed. Upon traversal of the stop segment and further rotation, the apparatus will operate in a manner as will be now described.

As the shaft 52, brush arm bracket 56, and brush arm holder 58 rotate in a clockwise direction the right angled brush holder extension 62 will pass freely under the cam-down lever 72 inasmuch as the stationary end of that lever is of sufficient height above the face plate 67 to allow such passage. As the extension 62 passes further it will pass over the stationary end of the cam-up lever 71 but as the opposite end of that lever has been moved to an upward or higher position under the action of the slide 74 the extension 62 will be cammed upwardly, or in a counterclockwise direction as viewed in Fig. 1. Such movement of the extension 62 causes the brush holder 58 to be rotated in a counterclockwise direction within the hollow portion 57 of the brush holder bracket 56 resulting in the arm 61 moving to and engaging in the upper notch 64 of the spring urged detent 63. In this position the brushes 59 are moved upwardly out of engagement with the rings 68 and 69 of the face plate 67.

Inasmuch as the send-stop lever 31 will be kept in its described condition causing the described contact pairs to remain closed and as the slide 74 and the cam-up lever 71 will remain also as described, the brushes 59 will be kept out of engagement from the rings 68 and 69 of the face plate 67 under the action of the detent 63, even though the shaft 52 continues to rotate.

Under the above condition, with the brushes 59 not traversing their associated rings, no signals may be transmitted over the line conductor to the distant station. Inasmuch as this is contrary to standard practice wherein "marking on the line" is utilized to indicate a stop or absence of signal condition, the contact pair 42 connected to the line circuit has been provided which when in its closed condition, as described, operates to place marking current on the line conductor completely bypassing the distributor 51 in a manner which is not shown but which is thought to be obvious.

If it is now desired to transmit from the instant apparatus the send-stop lever 31 will be operated manually through its handle 33 in a counterclockwise direction, Figs. 1 and 2, resulting in the bail 16 being released, and also resulting in the latching lever 38 moving to its clockwise position whereat it no longer applies pressure to the common insulator 41 and thus allows the contact pairs 42 and 43 to be opened. Any opening of the contact pair 42 results in marking current no longer being supplied to the line conductor by bypassing the distributor 51. The opening of the contact pair 43 results in the breaking of the energizing circuit for the magnet 79, which previously was traced through that contact pair. However, at such time the armature 77 will remain in its clockwise position due to engagement with the upper notch 82 of the spring urged detent 83.

Simultaneously, the downwardly extending arm 34 of the lever 31 will be moved in a counterclockwise direction resulting in its lower extremity engaging the common swinger 44 and moving it to its rightward position whereat the contact pair 46 will be opened and the contact

pair 47 will be closed. The opening of the contact pair 46 further precludes energization of the magnet 79 inasmuch as the circuit for such energization is necessarily traced through contact pair 46, when in a closed condition.

As described in the above-mentioned copending application, after movement of the send-stop lever 31 the lever 38 will free the bail 16 as the brushes 59 traverse the stop segment, releasing the contact pairs 42 and 43 only at this time. However, upon any movement of the lever 31 the arm 34 will allow the contact pair 46 to open and close the contact pair 47.

Upon the closure of the contact pair 47 an electrical circuit is established which may be traced from grounded battery 86, over the conductor 87, through the closed contact pair 47, over a conductor 91 and through the winding of the magnet 81 to ground. Magnet 81 will immediately become energized causing the armature 77 to be attracted thereto, or pivoted about its pivot point 78 in a counterclockwise direction (magnet 79 not now being energized). The pointed end of the armature 77 will no longer engage the upper notch 82 in the spring urged detent 83 but instead will now engage the lower notch 82 and be held in that position.

With movement in a counterclockwise direction of the armature 77 the common slide 74 will be moved downwardly, such being allowed through its slot 76, resulting in the lugs causing the cam-up lever 71 being pivoted in a downward or counterclockwise direction about its pivotal mounting with the stationary bracket 73 and the cam-down lever being pivoted downwardly or in a clockwise direction about its pivotal engagement with its stationary bracket 73.

As the shaft 52 rotates imparting similar motion to the brush arm bracket 56 and brush holder 58 the brush arm extension 62 will, at such time as it reaches the cam-down lever 72, pass under the leftward end thereof whereat it is connected to the bracket 73. As it continues to move in its clockwise direction it will engage the lower surface of the cam-down lever 72 and be rotated in a clockwise direction. Any clockwise rotation imparted to the brush arm extension 62 results in a similar clockwise rotation being imparted to the brush holder 58, mounted rotatably within the hollow portion 57 of the brush arm bracket 56. The arm 61 secured to the brush holder 58 will now engage the lower of notches 64 in the spring urged detent 63, holding the brush holder 58 in its clockwise position. Upon such movement being imparted to the brush holder 58 the brushes 59 will be moved downwardly in which position they will once again be in engagement with and traverse the segmented ring 68 and the solid ring 69 of the face plate 67. If the extension 62 had first reached the cam-up lever 71 it would have passed over the top thereof as the slide 74 had moved cam-up lever 71 to its downward position.

As just previously described the brushes 59 traverse the stop segment of the ring 68 and the lever 38 releases the bail 16, allowing the contact pairs 42 and 43 to open after the cam-down lever 72 has caused the brushes 59 to re-engage the ring 68. Such occurring at this time is necessary, because if the shunting contact pair 42 had been opened while the brushes 59 were in a raised condition a false start impulse would have been transmitted over the line conductor, incorrectly operating the receiving apparatus.

The fact that the contact pair 43 does not open

until this time does not affect the lowering of the brushes through the energization of the magnet 81, as the magnet 79 is de-energized at this time due to the opening of the contact pair 46.

Thus, as the apparatus continues to operate the brushes 59 will remain in engagement with the face plate rings 68 and 69 inasmuch as the send-stop lever 31 will remain in its counter-clockwise position with the contact pair 47 closed, the magnet 81 energized, and the slide 74 in its downward position.

The apparatus will thus continue to operate in a manner as is well known in the art as long as the send-stop lever 31 is retained in its "send" position.

While a specific embodiment of the invention has been described in conjunction with a particular application thereof it is to be understood that this is illustrative only and that various modifications may be made therein without departing from the scope and spirit of this invention.

What is claimed is:

1. In a distributor, a face plate carrying a pair of rings, a pair of brushes for engaging said pair of rings, a brush holder for supporting said brushes, a brush holder bracket in which said brush holder is mounted rotatably, means for rotating said brush holder bracket to cause said brushes to traverse said rings, and means for rotating said brush holder with respect to said brush holder bracket whereby said brushes will be raised out of engagement with said rings or lowered to engagement with said rings.

2. In a distributor, a face plate carrying a pair of rings, a pair of brushes for engaging said pair of rings, a brush holder for supporting said brushes, a brush holder bracket in which said brush holder is mounted rotatably, means for rotating said brush holder bracket to cause said brushes to traverse said rings, means for rotating said brush holder with respect to said brush holder bracket whereby said brushes will be raised out of engagement with said rings or lowered to engagement with said rings, and means to retain said brush holder in its rotated position.

3. In a distributor, a face plate carrying a pair of rings, a pair of brushes for engaging said pair of rings, a brush holder for supporting said brushes, a brush holder bracket in which said brush holder is mounted rotatably, means for rotating said brush holder bracket to cause said brushes to traverse said rings, a brush holder extension, a cam-up lever adjacent said extension, a cam-down lever adjacent said extension, and means for operating said cam-up and said cam-down levers, whereby said cam-up lever or said cam-down lever will engage said brush holder extension and cause said brush holder to be rotated in said brush holder bracket thereby raising said brushes out of engagement with said rings or lowering them to engagement with said rings.

4. In a telegraph transmitter, comprising a face plate, brush means for traversing said face plate, means for causing said brush means to traverse said face plate, tape sensing means, means for controlling the operation of said tape sensing means under the control of said means for causing said brush means to traverse said face plate, means to preclude operation of said tape sensing controlling means at a predetermined position of said brush means traversing said face plate, and means operating conjointly with said precluding means for causing said

brush means to be raised out of engagement from said face plate.

5. In a telegraph transmitter, tape sensing means, a bail for controlling the operation of said tape sensing means, an operating lever for controlling said bail, a rotary distributor including brush means for transmitting signal impulses in accordance with the setting of said tape sensing means, driving means for said rotary distributor and said operating lever, means to block said bail thereby precluding operation of said tape sensing means at a predetermined position of operation of said distributor, and means operating conjointly with said blocking means for causing said brush means to be raised out of engagement from said rotary distributor.

6. In telegraph apparatus, impulse initiating means, an impulse distributor including brush means for transmitting the impulses initiated, means for precluding operation of said impulse initiating means at a predetermined position of operation of said impulse distributor, and means under the control of said precluding means for disconnecting said brush means from said impulse distributor.

7. In a telegraph transmitter, signal initiating means, a distributor including brush means for transmitting the signals initiated, means for causing or preventing operation of said signal initiating means at a predetermined position of operation of said distributor, and means operating when said last-mentioned means prevents operation of said signal initiating means for raising said brush means from engagement with said distributor and when said last-mentioned means causes operation of said signal initiating means for lowering said brush means to engagement with said distributor.

8. In telegraph apparatus, signal initiating means, a distributor including brush means for transmitting the signals initiated, means for continuously rotating said brush means, means for precluding operation of said signal initiating means at a predetermined position of operation of said distributor, and means for raising said brush means from engagement with said distributor when the operation of said signal initiating means is precluded and under the control thereof, whereby said brush means will continue to rotate but will not engage said distributor.

9. In telegraph apparatus, a source of signals, a distributor including brush means for distributing the signals from said source of signals, means to preclude further signals from said source of signals at a predetermined position of operation of said distributor, and means responsive to the precluding of further signals and under the control thereof for raising said brush means from engagement with said distributor.

10. In a distributor, a face plate carrying a pair of rings, a pair of brushes for engaging said pair of rings, a brush holder for supporting said brushes, a brush holder bracket in which said brush holder is mounted rotatably, means for rotating continuously said brush holder bracket to cause said brushes to traverse said rings, a brush holder extension, and cam lever means adjacent said extension for controlling the rotation of said brush holder with respect to said brush holder bracket during the rotation of said brush holder bracket.

11. In a telegraph transmitter, a tape sensing device, a distributor, brush means associated with said distributor, means for blocking oper-

ation of said tape sensing device at a predetermined position of operation of said brush means, and means for connecting said distributor and said brush means when said blocking means are removed from blocking said tape sensing device and under the control thereof.

12. In telegraph apparatus, a tape sensing device, a distributor, a pair of brushes normally connected to said distributor, a signalling channel connected to said distributor, means to block operation of said tape sensing device at a predetermined position of operation of said pair of brushes, means to disconnect said brushes from said distributor as a result of said blocking operation and under the control thereof, and means responsive to the blocking operation and operating prior to the disconnection of said brushes to shunt said signalling channel.

13. In telegraph apparatus, a tape sensing device, a distributor, a pair of brushes normally connected to said distributor, a signalling channel connected to said distributor, means to block operation of said tape sensing device at a predetermined position of operation of said pair of brushes, means to disconnect said brushes from said distributor as a result of said blocking operation and under the control thereof, means responsive to the blocking operation and operating prior to the disconnection of said brushes to shunt said signalling channel, means for removing the shunting of said signalling channel, and means for reconnecting said brushes to said distributor operating prior to the removal of the shunting of said signalling channel.

14. In a distributor, a face plate, brush means for traversing said face plate, means for caus-

ing said brush means to traverse said face plate, means including a magnet for causing said brush means to be raised out of engagement with said face plate, an electrical means associated with said distributor for causing operation of said magnet and thus of said brush raising means.

15. In telegraph apparatus, in combination with a distributor comprising a face plate, brush means for traversing said face plate, means for causing said brush means to traverse said face plate, a signal initiating means comprising tape sensing means and tape advancing means both under the control of said means for causing said brush means to traverse said face plate, means for preventing operation of said tape sensing means and said tape advancing means at a predetermined position of said brush means traversing said face plate, means associated with said distributor for causing said brush means to be raised out of engagement of said face plate, and means operated by said means for preventing operation for causing operation of said brush raising means.

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