

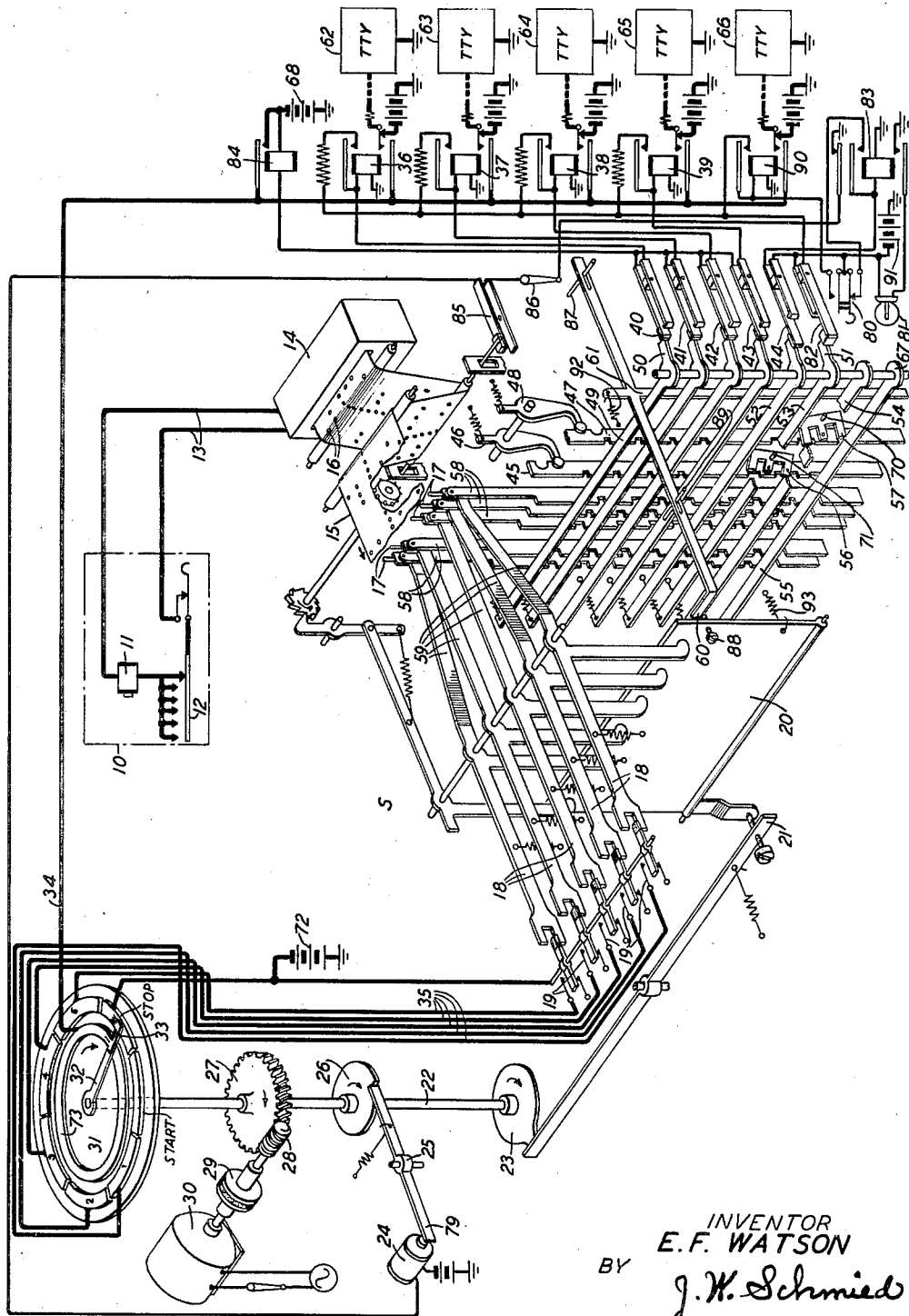
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TELEGRAPH SYSTEM

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TELEGRAPH SYSTEM

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This invention relates to communication systems and more particularly to an automatic switching arrangement for automatically and selectively directing telegraph messages to one of a plurality of telegraph stations or receiving instruments.

In previous switching systems, such as shown in my Patent 2,154,592, granted April 13, 1939, it is necessary to employ a separate and distinct selector for controlling the switching apparatus, which selector is entirely separate and distinct and independent of the transmitting apparatus located at the switching point.

It is an object of the present invention to provide an improved and simplified switching arrangement having a combined transmitting and selecting apparatus.

A feature of this invention relates to an arrangement for controlling a combined switching and selecting apparatus by signals perforated or punched in a tape or by signals recorded in some other recording medium.

Another object of my invention is to provide means for rendering a portion of the selecting apparatus non-responsive to signals recorded in the control medium.

Still another object of my invention is to provide means for selectively rendering one or more portions of said selecting apparatus responsive to signals stored in said recording medium.

Another object of my invention is to provide an arrangement for rendering the selecting apparatus effective or ineffective by wholly mechanical means.

Another object of my invention is to render portions of a selecting apparatus operative to control switching circuits under certain conditions while another portion remains effective to control said switching circuits at all times.

Still another object of this invention is to provide means for stopping both the transmitting apparatus and the selecting apparatus in response to certain perforations or certain combinations of perforations or signals recorded in the tape.

Another object of this invention is to operate a signaling device in response to certain perforations, signals or combinations of perforations or signals recorded in the tape to attract the attention of an operator or attendant and to convey certain information to her.

Briefly, in accordance with this invention, a tape transmitter is supplied with punched or perforated tape either from a local keyboard perforating apparatus or from a reperforating de-

vice operated by telegraph signals received from a telegraph line.

A perforated tape is employed to control the transmitter for transmitting telegraph signal impulses over an outgoing telegraph line. The transmitter is also provided with a selector arrangement which is also controlled by the perforated tape. The selector is arranged to selectively operate switching contacts for operatively associating the tape controlled transmitter with one or more of a plurality of telegraph receiving stations or instruments.

The selector is provided with additional mechanical elements which normally prevent it from responding to perforations in the tape and thus is ineffective to operate the switching contacts. Means are provided which are responsive to certain combinations of perforations or signals stored in said tape for rendering said selecting equipment or a portion thereof responsive to succeeding combinations of perforations or signals in the tape. Other means are provided for again rendering said selecting equipment non-responsive to the perforations in the tape after the tape transmitter has been selectively connected to the desired stations or receiving instruments.

Additional means are provided to stop the transmitter and selector in response to certain signals or groups of signals recorded in the tape and to operate a signal to attract the operator's or attendant's attention and to indicate the destination of the following message or to convey other information to her. Switching circuits are also provided to enable the operator to connect the transmitter to the proper circuits or instruments at will.

The foregoing objects and features of this invention, may be more fully understood from the following description when read with reference to the attached drawing which shows one specific embodiment of this invention.

As shown in the drawing, the telegraph station 10 is provided with a receiving device 11 and transmitting contacts 12. This apparatus may be of any suitable type, as, for example, the apparatus described in U. S. Patents 1,745,633, Morton et al., February 4, 1930, and 1,904,164, Morton et al., April 18, 1933. This apparatus is connected over line 13 to a switching station S where it terminates in a receiving device 14 which is arranged to record the received signals as combinations of perforations 16 in a tape 15. Devices of this type are described in detail in U. S. Patents 2,005,748, Larson, June 25, 1935, and 2,042,788, Krum, June 2, 1936. The tape 15 may

also be perforated by means of a keyboard perforator at the switching station S and passed from the perforating device into the transmitting device shown at station S. Typical examples of apparatus of this type are described in greater detail in U. S. Patents 1,965,572, Burcky et al., July 10, 1934; 1,965,602, Lake, July 10, 1939; and 1,969,891, Lake et al., August 14, 1934. The apparatus disclosed in the above-identified patents and the descriptions thereof in these patents are hereby made a part of this application as if fully included herein.

The transmitting device at station S is provided with a number of pins 17 to determine if and in what position the tape 15 is perforated. During the operation of the transmitter these fingers rise and bear against the tape 15. If there are perforations in the tape above any one of these fingers or pins 17, they will go through the perforations and raise the associated lever 59 further than the levers 59 associated with pins which do not go through perforations. As a result, contacts 19 will close only when the corresponding fingers 17 go through perforations in the tape. This causes corresponding signals to be transmitted by distributor 31 over line 34 during the rotation of brush arm 32.

Also associated with each of the pins 17 is a selector bar 58 having notches cut in its side or edge. When the corresponding pin 17 goes through a perforation in the tape these permutation selector elements or bars 58 will be raised so that the notches in them will line up in front of one of the switch levers 49. These switch levers are normally prevented from rotating by the two notched bars 45 and 47. Bars 45 and 47 are arranged to occupy one of two positions and are arranged to be shifted from one position to the other in response to certain perforations or combinations of perforations recorded in the tape. A switching contact, such as contact 49, is controlled by an extension, such as 50, on the selected element or switch bar 49. These contacts are arranged to operate the switching relays 36 through 39 and relay 84. Relays 36 through 39, when operated, lock operated under control of contacts 82, which contacts are in turn controlled by the switch lever 53. Upon the operation of any of the switching relays 36 to 39, and the subsequent release of relay 84 as described hereinafter, the corresponding telegraph station or receiving instruments 62 through 65 are connected to the transmission line 34 and will receive the telegraph signals transmitted over a line 34 by the transmitting distributor 31.

Contacts 44, when operated by switch lever 52, cause relay 83 to operate. Relay 83, in turn, stops the advance of the tape transmitter and lights lamp 81. The operator or attendant, upon noting lighted lamp 81, can operate key 89 which, in turn, causes relay 90 to operate, and relay 83 to release. The operation of relay 90 connects station 65 to line 34 and the release of relay 83 extinguishes lamp 81 and permits the operation of the transmitter.

Normally, the system will remain in the position shown in the drawing when no signals are being transmitted, except that the selector elements 45 and 47 will normally be in the position opposite to the position shown where they will prevent any of the switch levers 49 through 53 from operating.

When a sufficient quantity of tape is perforated, the contacts 85 will close and complete a

circuit for operating the start magnet 24 from battery through the winding of start magnet 24, switch 86, to ground through the upper break contacts of relay 83. The operation of the start magnet 24 will rotate the stop latch 79 about pivot 25 so that it will disengage the stop cam 26. This will permit motor 30 to rotate shaft 22 through gears 27 and 28 and friction clutch 29. Shaft 22, upon rotating, will rotate cam 23 which in turn will allow lever 21 to rotate in a clockwise direction. This will allow plate 20 to rotate in a clockwise direction and permit the pins 17 to rise against tape 15, and carry with them the selector elements 58. The pins finding perforations above them in the tape will also cause the corresponding contacts 19 to close so that when distributor arm 32 rotates over the distributor segments 1 through 5 corresponding signal impulses are transmitted over line 34. However, under assumed conditions, line 34 is not connected to any of the receiving stations or instruments 62 through 66 so the above-described operation is ineffective to transmit the messages recorded in the tape.

The above-described operation will continue until the notches in the selector elements 58 are lined up in front of the lever 67. The notches in the selector elements 58 will line up in front of the selector bar in response to some one or more specific code combinations, as, for example, the "Figures" combination, perforated in tape 15, which signal will be called hereinafter an activating signal.

When the notches in the selector elements 58 are lined up before the lever 67, and as plate 20 continues to rotate in a clockwise direction, the rear end of screw 88 will engage the bent end 60 of member 61 and slide it to the right on pins 87 and 89 against the action of spring 92. Lever 67 will then rotate in a clockwise direction and press against the lower bar of the E-shaped member 57. This member 57 is pivoted at 70 so that when it is thus rotated in a counter-clockwise direction it will move the selector element 47 to its lower position, as shown in the drawing. When selector element 47 is moved to its lower position, the notches in its front edge will be opposite the other selector bars and thus permit them to rotate, provided notches in the other selector elements are lined up before the respective selector bars. At this time, however, the selector element 45 is still in its lower position so that, except for the levers 53, 54 and 67, the other switch levers are maintained in their non-operate position by the edge of this selector element because the notches in its front edge are not opposite the selector bars. When the notches in the other selector elements 58 are lined up in front of the lever 53 in response to another code combination recorded on the perforated tape 15, as, for example, the letter H combination, the lever 53 will rotate in a clockwise direction and cause the E-shaped member 56 to rotate in a clockwise direction. This member 56 is pivoted at 71 so that, when it rotates in a clockwise direction, it will raise the selector element 45 to a position shown where the notches in its front edge will be opposite the other selector bars.

The rotation of lever 53 at this time opens contacts 82, but under the assumed conditions the opening of these contacts at this time produces no useful result.

It is to be understood that near the completion of each revolution of shaft 22 cam 23 will operate

lever 21 in a counterclockwise direction. This will, in turn, rotate plate 20 in a counter-clockwise direction. The rotation of plate 20 in a counter-clockwise direction first moves member 61 to its left-hand position where it engages any of the switch levers which have been previously operated or rotated in a clockwise direction as described above, and rotates them to their non-selected position out of engagement with the notches in the front edge of the selector elements 58, 45 and 47. Thereafter, the continued rotation of the plate 20 in a counter-clockwise direction will withdraw the fingers 17 from engagement with the perforations in tape 15 and finally cause the advancement of the tape 15 to the next position, whereupon the above cycle is repeated, assuming, of course, that a sufficient supply of perforated tape is available so that contacts 85 do not open.

The following group of perforations in the tape will again permit certain of the fingers 17 to rise through the corresponding perforations and cause the notches in the front edge of the selector elements 58 to line up before one of the switch levers 49. Assuming the uppermost selector bar 49 is selected by the letter A, when the perforations representing the letter A follow the perforations representing "Figures" and "H" in the tape, the switch lever 49 will be rotated in a clockwise direction, whereupon the extension 50 will cause contacts 49 to close. The operation of contacts 49 completes a circuit for the operation of relays 36 and 34 from battery 68 through the winding of relay 84, operated contacts 49 and the winding of relay 35 to ground. The operation of relay 84 connects battery to the transmission circuit 34 which prevents only a portion of a code group of impulses being transmitted to the selected station or receiving device upon the operation of relay 36 as described below. As brush arm 32 nears the completion of the revolution then in progress, cam 23 rotates lever 21 in a counter-clockwise direction and this lever, in turn, rotates plate 20 in a counter-clockwise direction, which permits spring 92 to restore member 61 to its left-hand position and rotate switch lever 49 in a counter-clockwise direction, causing contacts 40 to open and interrupt the operating circuit of relay 84. Relay 84 thereupon releases and removes the battery 68 from the transmission circuit.

The operation of relay 36 completes a circuit for maintaining itself operated from battery 91 through the break contacts 32, the upper operated contacts of relay 35 and winding of relay 36 to ground. The operation of relay 36 also connects transmission line 34 to the telegraph station or receiving device 62. The succeeding signals then transmitted over the line 34, as described above, will be transmitted to station 62.

If the following signal recorded in the tape is, for example, the code combination representing the letter B, the notches in the selector elements 58 will be lined up before the second switch lever 49 so that this lever may now rotate in a clockwise direction when plate 20 is rotated in a clockwise direction. This will cause contacts 41 to close, which in turn completes a circuit for the operation of relays 84 and 37. The operation of relay 84 again connects battery 68 to the transmission circuit and thus prevents the transmission of this character to station 62 or a portion of it to station 63. It should be noted that, in order to insure that neither the controlling characters are printed on either or any of the

receiving instruments, relay 84 should be fast in operating so it will operate before any of the relays 36 to 39 operate. Also, contacts 40 through 44 and 82 should close before the brush 33 leaves the stop segment of the transmitting distributor. However, if this last condition is not met, no harm will result because these contacts will close and relay 84 operate before brush 33 reaches segment 1. In this case only a "Letters" signal is transmitted to the connected station 62 but is not printed by the receiving machine at this station.

The operation of relay 37 completes a locking circuit for maintaining itself operated and also extends the transmission circuit 34 to the telegraph station or receiving device 63. Thus, both the telegraph stations or receiving devices 62 and 63 will now receive the signals transmitted by a transmitting distributor 31.

Assuming now that the following code combination recorded in the tape 15 is a "letters" signal, when the fingers 17 are raised against the tape they carry with them the selector elements 58. The notches in the front edges of these elements will line up before the lever 54 and thus allow it to rotate in a clockwise direction. Obviously additional levers similar to 52, 53 and 67 may be provided which are responsive to other code combinations, as for example a "spacing" code combination, recorded in the tape and cooperate with other E-shaped members on selectors 45 and 47 for also controlling these elements.

In rotating in a clockwise direction the selector bar 54 will engage the upper bar of the E-shaped member 57 and rotate it in a clockwise direction around pivot 70, thus raising the selector element 47 to its upper position. In operating selector element 47 to its upper position, the front edge of this element will thereafter engage the front edge of the other switch levers and thus prevent them from rotating in a clockwise direction when the notches in the front edges of the selector elements 58 are lined up before any of these switch levers. The rotation of the lever 54 in a clockwise direction also engages the lower bar of the E-shaped member 56, thus rotating it in a counter-clockwise direction and thus moving the selector element 45 to its lower position. This, in turn, will prevent all of the other switch levers, except levers 54 and 67, from rotating in a clockwise direction when the notches before any of these levers in the front edges of the selector elements 58 are lined up before any of them.

The succeeding code combinations perforated in the tape 15 will then cause the corresponding fingers 17 to rise through the perforations in the tape and control the transmitting contacts 19. These contacts, in turn, control the signals transmitted by the transmitting distributor 31 during each revolution of the brush arm 32. The signals transmitted by this distributor are transmitted over line 34 to the typewriter stations or receiving devices 62 and 63. The transmission circuit may be traced from battery 72 through the operated contacts 19 and associated distributor segments 1 through 5, the distributor brush 33, segment 73, conductor 34, the lower operated contacts of relays 36 and 37 to ground through the receiving devices at stations 62 and 63.

When it is desired to interrupt the established connections at the completion of the transmission of the message or at any other time, a figures signal is sent followed by an H signal. When the figures signal arrives over the pins 17, the

notches in the selector elements 58 will line up in front of the lever 67 when the fingers 17 go through the corresponding perforations in tape 15. This will cause the selector element 47 to be operated to its lower position, as shown in the drawing. Similarly, when the following letter H signal arrives over pins 17, the selector elements 58 will be positioned so that the notches in their front edges will line up before the switch lever 53 and thus permit this lever to rotate in a clockwise direction, as viewed in the drawing. The switch lever 53 in rotating in a clockwise direction causes contacts 82 to open which in turn interrupts the locking circuits of relays 36 and 37, thus permitting these relays to release and disconnect the transmission circuit 34 from the receiving apparatus or stations 62 and 63.

The rotation of the switch element 53 in the clockwise direction at this time also causes the upper bar of the E-shaped member 56 to be moved backward and thus raises the selector element 45, thus activating or conditioning a portion of the selecting equipment so that it will be in condition to connect the desired receiving apparatus to the transmitting line 34 in response to the succeeding signals or combinations of signals recorded in the tape 15.

Assume now that the following message is preceded by a letter O combination and that when this combination arrives above the pins 17 the notches in the front edges of the selector elements 58 will be lined up before the switch lever 52, thus permitting switch lever 52 to rotate in a clockwise direction and operate contacts 44. The operation of contacts 44 completes an obvious circuit for the operation of relay 83. Relay 83, in operating, completes a circuit for maintaining itself operated from the battery 91, lower break contacts of key 80 and inner upper operated contacts of relay 83 to ground through the winding of relay 83. The operation of relay 83 also interrupts the circuit of the magnet 24, thus causing this magnet 24 to release armature 79, and stop the transmitting distributor 31. This, in turn, stops the feeding of the tape 15 past the pins 17 at the completion of the revolution of the distributor 31 then in progress.

The operation of relay 83 also completes an obvious circuit for lighting lamp 81.

The lighting of the signal lamp 81 before the operator or attendant indicates to her that the succeeding message in the tape was intended for station 66. The operator will then operate key 80 which completes an obvious circuit for the operation of relay 90. Relay 90 completes a locking circuit for maintaining itself operated from ground, through its winding and upper operated contacts to battery 91, through the break contacts 82. Relay 90, in operating, also connects station 66 or the receiving apparatus thereat to the transmission circuit 34 and thus establishes a transmission path from distributor 31 to receiving device 66.

The operation of key 80 also interrupts the locking circuit of relay 83, thus permitting this relay to release which, in turn, extinguishes lamp 81 and completes a circuit for operating the start magnet 24. The start magnet will operate and withdraw the stop latch from engagement with stop cam 26 and thus permit the transmitting distributor 31 to rotate, whereupon the message recorded in the tape is transmitted to the receiving device 66.

A "letters" or other deactivating signal should

follow the letter O signal recorded in the tape. As pointed out above, this "letters" signal will cause the lever 54 to rotate in a clockwise direction and engage both of the E-shaped members 56 and 57 and, in turn, move the selector element 45 to its lower position and the selector element 47 to its upper position where these elements will engage all of the switch levers except 54 and 67 and prevent their operation. Consequently, during the transmission of the remainder of the message recorded in the tape 15 to station 66 the selecting equipment may be rendered inactive and ineffective to disconnect station 66 from the transmission line 34 or to connect any other station thereto.

At the completion of the transmission of this message to station 66, a figures signal followed by an H signal will be recorded in the tape which, in turn, will cause contacts 82 to open, as described above, and release relay 90, thus disconnecting the receiving apparatus 66 from the transmission path 34. This figures signal, followed by the H signal, will also condition the selecting equipment so that it will be responsive to the succeeding signal stored in the tape 15 to cause the desired station to be connected to the transmission circuit or operate any desired lamp or signal before the operator or attendant to convey to her any desired information. It is to be understood that more than one lamp 81 or other signals or alarms may be provided and operated by the same or different code combination or groups of combinations recorded in tape 15. It is also in the scope of this invention to provide additional keys similar to key 80 to permit the operator or attendant to connect any desired receiving apparatus to the transmission path 34.

It is also within the scope of this invention to provide additional selector elements, similar to 45 and 47, each of which will permit any number or portion of the switch levers to rotate when the notches in the other selector elements 58 are lined up before the respective bars. The selector elements 45 and 47 or others similar to them may be arranged so that only a portion of the total number of switch levers will be released to respond to the perforations in the tape. In addition, if desired, the notches in the selector bars may be so arranged that the switch 82 will at all times respond to a particular group of perforations in the tape and thus release the connecting stations upon the reception or arrival of this particular group of perforations in the tape over the selector pins, such as 17.

It is also within the scope of this invention to arrange the notches in the special selector elements 45, 47 and other elements similar to these, such that the code combinations have to appear in a definite order in the tape, as, for example, as described above, it is necessary that the figures signal appear before the H signal in order to release the remaining switch levers. If the H signal appears first, the lever 53 will be prevented from rotating in a clockwise direction when the notches in the selector element 58 are lined up in front of it because the selector element 47 will be in its upper position and thus prevent the rotation of lever 53 in a clockwise direction. Consequently, selector element 47 will remain in its lower position. It is, of course, possible to provide notches in the selector elements 45 and 47 before both levers 57 and 53 so that they may be operated to the positions shown independently of the order in which these two sets of signal conditions appear in the tape.

It should be noted that, except for the activating or conditioning combination of groups of code combinations, the same signal combinations may be transmitted over conductor 34 after the connection is established as used for establishing a connection without altering or changing in any way the connections which have been previously established by similar signals. In order to render the selecting equipment operative or effective, it has to be conditioned by the reception of certain predetermined signals or groups of signals in order to respond to the other signals recorded in the tape to control the switching. Thereafter, in response to a deactivating signal, the selecting equipment is rendered non-responsive to any further perforations in the tape until the activating signal combinations again appear in the tape.

The selector elements 45, 47 and other elements like them, which may be provided, are maintained in the position to which they were last moved to by the E-shaped members 56 and 57 by means of the spring control detents 46 and 48. These detents cooperate with notches or projections on these selector elements to maintain them in a position last set by the E-shaped members. These detents, however, do not positively lock the selector elements 45 and 47 in their respective positions but merely hold them there until moved to the other position by the E-shaped members in response to corresponding perforations in tape 15. In other words, the actuation of selector bars, in pressing against the ends of the upper or lower bars of the E-shaped member, are sufficient to move the selector elements 45 or 47 against the action of the spring controlled detent members 46 and 48, thus causing these members to be set in the new position.

While permutation code signals are employed by the apparatus described above, it is to be understood that any other suitable type of code or signaling impulses may be employed equally well without departing from the scope of this invention.

What is claimed is:

1. A combined telegraph transmitting and selecting device comprising a telegraph transmitting device, means responsive to perforations in a tape for controlling said telegraph transmitter, a selecting arrangement wholly mechanically controlled by said means responsive to perforations in said tape, apparatus for mechanically rendering a portion of said selecting device non-responsive to perforations in said tape, means mechanically controlled by the remaining portion of said selecting device for rendering said selecting device responsive to perforations in said tape, and switching apparatus controlled by said selecting device for connecting said transmitting apparatus to at least one of a plurality of telegraph channels.

2. In a telegraph transmitting device, means controlled by perforations in a tape, means for advancing a perforated tape through said means controlled by perforations, a telegraph transmitting device for transmitting permutation code groups of telegraph signaling impulses, an operative connection between said perforation controlled means and said transmitter for causing said transmitter to transmit telegraph signaling impulses in accordance with perforations in said tape, a selecting device, an operative connection which is exclusively mechanical between said selecting device and said perforation controlled means, a plurality of selectable elements con-

trolled by said selecting device, and a plurality of switching devices controlled by said selectable elements for selectively and simultaneously connecting said transmitter to any number of a plurality of telegraph channels.

3. A permutation code controlled switching device comprising a plurality of selector elements, mechanical linkages for positioning said elements in accordance with perforations in a tape, a plurality of selectable elements controlled by said selector elements, a switching device controlled by each of said selectable elements, apparatus for mechanically rendering a portion of said selectable elements non-responsive to said selector elements, and means controlled by certain of said remaining selectable elements for rendering said disabling means ineffective.

4. A switching device mechanically controlled by signals recorded in a recording medium comprising a selecting device controlled entirely mechanically by signals recorded in said medium, a plurality of selectable elements controlled by said selecting device, mechanical apparatus for rendering said selectable elements non-responsive to said selector, and means responsive to the operation of certain of the remaining selectable elements in a predetermined order for rendering a group of said first portion of selectable elements responsive to said selecting device.

5. In a permutation code controlled switching device comprising a group of permutation elements, means for mechanically controlling said elements in accordance with permutation signals recorded in a storing medium, a plurality of selectable elements arranged in mechanically engageable relation with said permutation elements, means for rendering a large proportion of said selectable elements non-responsive to said permutation elements, other selecting elements controlled by the remaining portion of said selectable elements for rendering a group of said first portion of selectable elements responsive to said permutation elements, and a group of switching devices controlled by said selectable elements.

6. A signal device responsive to signals recorded in a signal recording medium comprising means for determining the character of signals recorded in said medium, other apparatus controlled by said first means for selectively operating one of a plurality of sets of switching devices, means for normally preventing the operation of said switching devices, other apparatus responsive to certain signals recorded in said medium to render said selecting apparatus effective to operate said switching devices in response to signals recorded in said medium, a signaling device located before an operator, and means responsive to the operation of certain of said switching devices for operating said signaling device.

7. In a telegraph system, a transmitting device controlled by permutation signals recorded in a tape comprising in combination means for continuously determining the character of the signals recorded in said tape, transmitting apparatus controlled by said first means for transmitting signals corresponding to the signals recorded in said tape, other apparatus directly controlled by said first means for selectively operating one of a plurality of sets of switching devices, means responsive to the operation of said selected switching device for interrupting the operation of said transmitting device, a signal indicating device, and other means responsive to the operation of a

selected switching device for operating said signal indicating device.

8. In a telegraph system, a plurality of receiving devices, transmitting apparatus, a tape having permutation signals recorded therein, means for determining the character of the signals recorded in said tape, an operative connection between said transmitter and said first means for causing said transmitter to transmit signals in accordance with the signals recorded in said tape, a selecting device, an operative mechanical connection between said selecting device and said first means for controlling said selecting device in accordance with the signals recorded in said tape, means for normally rendering said selecting device non-responsive to the signals recorded in said tape, means responsive to certain signals recorded in said tape for rendering said selecting device responsive to succeeding signals recorded in said tape, a signal indicating device, an operative connection between said signal indicating device and said selector for operating said indicating device in response to a certain combination of signals recorded in said tape, switching apparatus to connect said transmitter to one of said plurality of receiving devices and means responsive to the connection of said transmitter to said receiving device for restoring said signal indicating device to normal.

9. A flexible tape, means for storing permutation code combinations therein, a single set of instrumentalities having elements capable of assuming two conditions successively under the influence of successive of said code combinations, permutation code transmission means controlled by said instrumentalities, and switching apparatus directly controlled by said instrumentalities and operated independently of the operation of said transmitting means for selectively establishing or disestablishing transmission paths from said transmission means.

10. In a telegraph transmitting device controlled by stored signals, a group of permutation elements each having two positions, apparatus for mechanically setting said permutation elements in accordance with stored signals, telegraph signal transmitting apparatus for transmitting in succession signaling pulses forming permutation code groups of pulses, an operative connection between said transmitting apparatus and said permutation elements for controlling the respective pulses of said groups of pulses transmitted by said transmitting apparatus in accordance with the setting of said permutation elements, selecting apparatus operating independently of said transmitting apparatus, and a

mechanically operative connection between said selecting apparatus and said permutation elements for entirely mechanically controlling said selecting apparatus in accordance with setting of said permutation elements.

11. In a telegraph transmitting device, a storage medium for storing telegraph signals, a plurality of permutation elements, apparatus for mechanically positioning said elements in accordance with signals stored in said medium, a transmitting distributor, an operative connection between the said permutation elements and said distributor for transmitting signals in accordance with the setting of said permutation elements, and other apparatus entirely independent of said operative connection entirely mechanically controlled by the setting of said permutation elements responsive to predetermined settings of said permutation elements for controlling the operation of said transmitting distributor.

12. In a combined telegraph transmitting and selecting device controlled by signals stored in a flexible tape, a plurality of permutation elements, apparatus for positioning said elements in accordance with the signals stored in said tape, a telegraph transmitting distributor, contacts controlled by said permutation elements connected to said distributor for controlling the character of the signals transmitted in accordance with the setting of said permutation elements, selecting apparatus exclusive of said transmitting distributor and said contacts for selectively closing one of a plurality of electrical circuits, and an operative connection between said selecting apparatus and said permutation elements operating independently of said transmitting distributor and said contacts for controlling said selecting apparatus in accordance with setting of said permutation elements.

13. A signaling device responsive to signals stored in a signal recording tape comprising apparatus for determining the character of each signal stored in said tape, apparatus mechanically connected to and entirely mechanically controlled by said determining apparatus for selectively operating one of a plurality of sets of switching devices, instrumentalities for normally preventing the operation of said switching devices under control of signals stored in said tape and apparatus responsive to certain predetermined signals stored in said tape for rendering said switching devices responsive to the succeeding signals stored in said tape.

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