

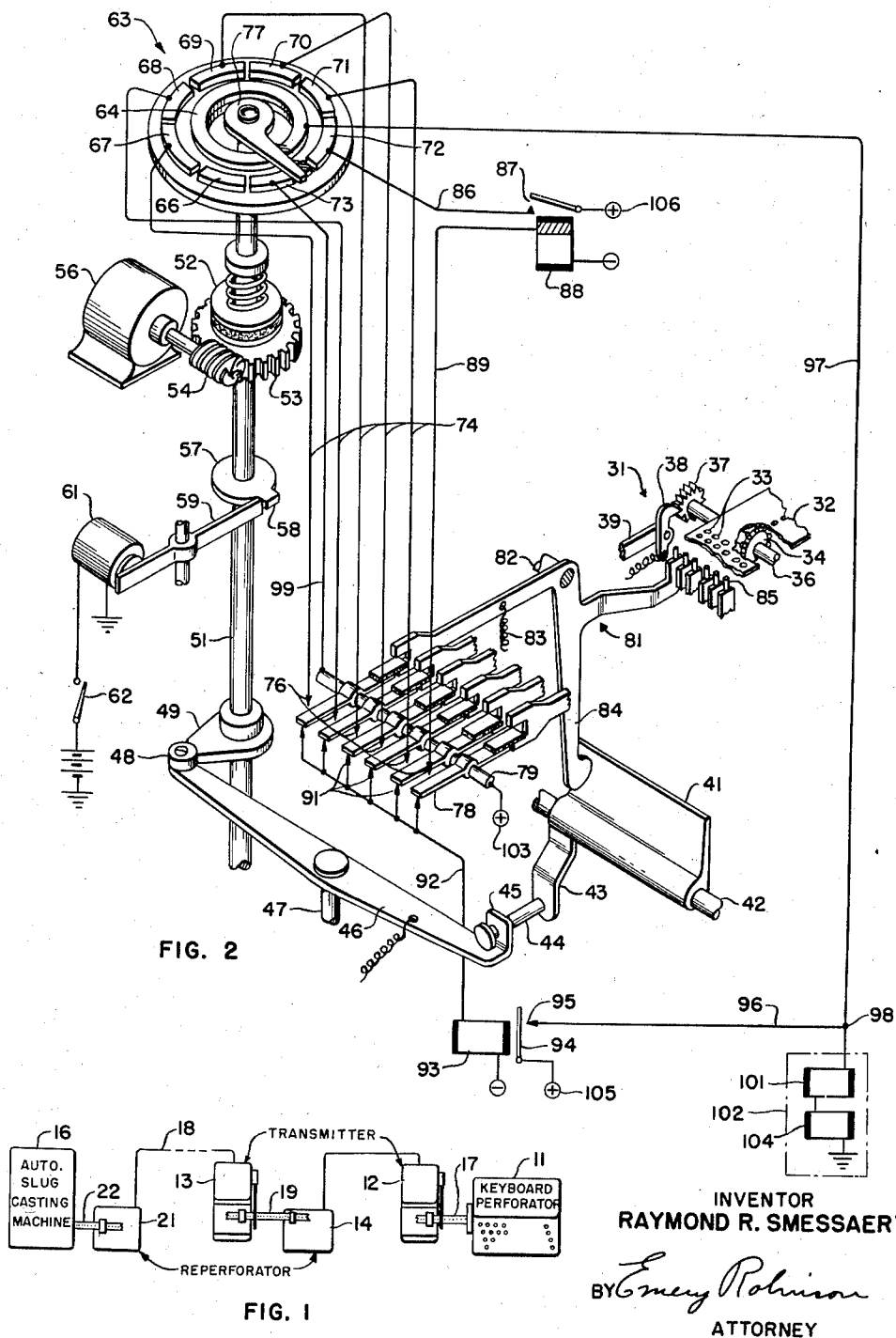
Nov. 25, 1958

R. R. SMESSAERT
TRANSMITTER SUPPRESSOR

2,862,053

Filed Oct. 24, 1955

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

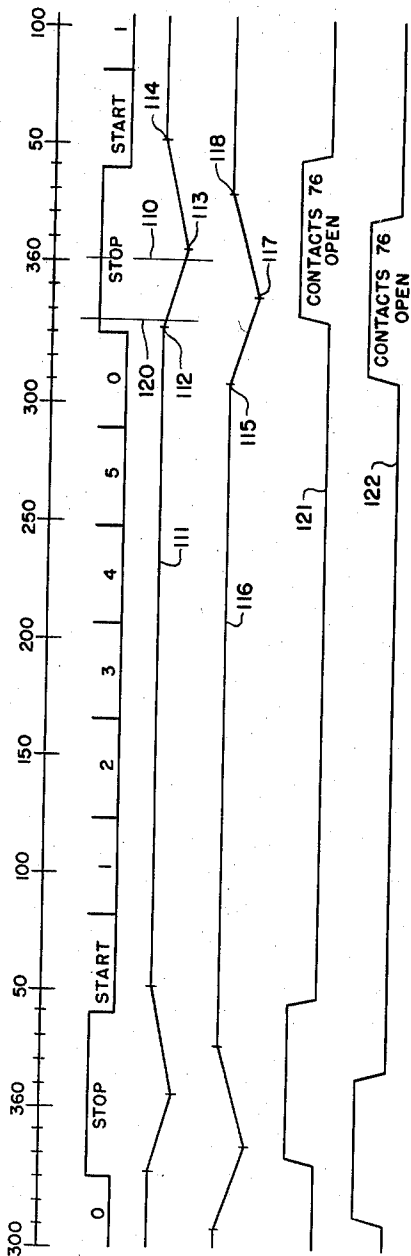


FIG. 3

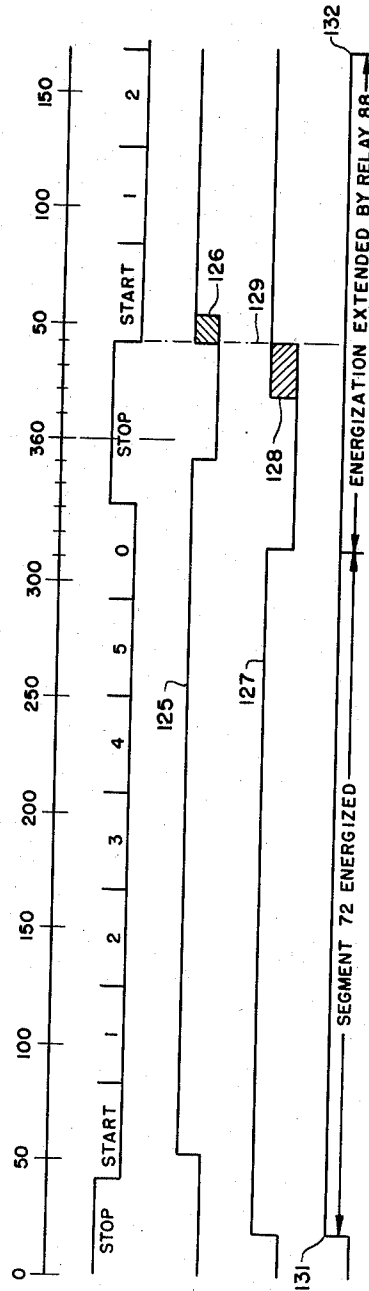


FIG. 4

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2,862,053

TRANSMITTER SUPPRESSOR

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Application October 24, 1955, Serial No. 542,447

6 Claims. (Cl. 178—17)

This invention relates to transmitter suppression arrangements and more particularly to the suppression of transmission of predetermined code signals.

In preparing perforated tape for the remote telegraphic control of typesetting machines wherein the lengths of lines vary according to the column widths of the matter to be composed, it is highly desirable, and even necessary, that the lines of composed matter represented by the perforations in the tape be justifiable before they are transmitted, and thus the arrangement according to the present invention is provided to afford a means between the tape transmitter and the keyboard perforator for precluding the transmission of groups of electrical impulses representative of a line of composition not capable of justification. Justification, as is commonly known in the typographical art, is the process of making the composed line fill a predetermined length of line or column width to be set. Briefly, in the typographical art, composing machines of the linecasting type are provided with matrices which consist of small brass units carrying indented characters in their edges and which are of different thicknesses due to the fact that the characters vary in width. Thus, when these matrices are assembled into a line of predetermined definite length, the number of matrices necessary to complete the line varies with the particular matrices used. The length of line, therefore, is dependent not upon the number of characters in the line, but rather upon the thicknesses of the characters or matrices making up the line. Consequently, it is necessary, during the preparation of a perforated tape representing lines of composed matter, to totalize the various thicknesses of matrices corresponding to the code perforations made in the tape, so that the operator will be apprised at all times of the length of line remaining as each key is operated and can thus judge the justifiability of the line.

Cooperating with the character matrices and equally determinative of the justifiability of the line, are the justifying matrices, commonly known as expansible spacebands or word spacers which comprise a portion analogous to and having the contour of a character matrix and which is positioned in the line of matrices usually between each series of character matrices comprising a word, and this portion has slidably articulated thereto and depending therefrom a wedge portion. By means of the wedge portions, the justifying matrices are adjusted between certain ranges of thickness before the casting operation is performed.

Therefore, in order to effect the determination of this justification before transmission of typographical matter over a signal line to a remote station to operate linecasting machines thereat telegraphically, an indicator is provided at the transmitting station which takes cognizance of the expansibility of the spacebands as well as the totalization of the character matrices, and wherein these two functions are performed simultaneously and the net resultant effect is apparent to the operator at all times, who is apprised constantly of the

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justifiable condition of the line of composition to be set. Such an indicating device may be of the type disclosed in United States Patent No. 2,059,250 granted November 3, 1936 to H. L. Krum.

When it is determined that the line being perforated in the tape is not justifiable, it becomes necessary to delete the non-justifiable line and then to perforate a new line capable of justification. These errors or deletions are eliminated by superimposing over the permutative indicia or apertures a series of "rub-out" code signals, which are a series of indicia or apertures in a transverse row equal in number to the maximum number of code elements in the particular code utilized. The insertion of these rub-out signals is accomplished by backing up the tape to the beginning of the line or portion to be deleted, and then repeatedly operating the rub-out key, as a result of which, during the ensuing forward movement of the tape, the all marking or "rub-out" code signal will be perforated in the tape, being superimposed over the matter to be deleted.

Manifestly, the transmission and receipt of such rub-out signals is a useless operation of the equipment, and an undue waste of line time in transmission. Therefore, the next step preparatory to the ultimate transmission of the edited composed matter to the remote receiving station is to prepare a new tape at the sending station, in which all of the rub-out code signal perforations have been eliminated.

Accordingly, an important object of the present invention is to provide facilities for enabling the economical use of telegraph equipment and signal line time.

Other objects and advantages of the present invention will be apparent from the following detailed description when considered in conjunction with the accompanying description, wherein:

Fig. 1 is a diagram of a system of remote typesetter control wherein the typesetting mechanism is controlled automatically from a perforated tape which may be prepared telegraphically;

Fig. 2 is a schematic arrangement illustrating a transmitting station having included therein facilities for suppressing transmission of rub-out code signals, and

Figs. 3 and 4 are diagrams illustrating the timing relationships pertinent to the present invention.

Typesetting by telegraph comprises, fundamentally, a telegraph system and a mechanical type composing apparatus. The latter may be such as is disclosed in United States Patents Nos. 436,531 and 436,532 to O. Mergenthaler dated September 16, 1890. The line of type produced by said type composing machine may be composed automatically through the medium of perforated tape by the method set forth in United States Patent No. 2,091,286 issued August 31, 1937 to H. L. Krum, et al. This patent discloses a permutation code operated device adapted to a modern type slug casting machine, whereby the type slugs or lines of type may be produced automatically under the control of the tape.

A schematic illustration of such a control system is disclosed in Fig. 1. The keyboard perforator 11 is of the type shown in the aforementioned Krum Patent No. 2,059,250, while the transmitters 12 and 13 are substantially of the construction disclosed in Teletype Bulletin No. 141, Issue 3, issued March, 1942, by the Teletype Corporation of Chicago, Illinois. As described in that bulletin, the transmitter comprises a tape sensing means and a rotary brush-type distributor for imparting the signal impulses successively to the signal line. The reperforators 14 and 21 may be of the type shown in United States Patent No. 1,884,743 dated October 25, 1932, and the automatically operated slug casting machine 16 may be the combination as disclosed in the afore-

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mentioned Mergenthaler patent and the Krum et al. Patent No. 2,091,286.

In the system shown in Fig. 1, the typographical matter is prepared upon the keyboard device 11 by perforating a tape 17 which is fed into the transmitter 12. In accordance with the present invention it is presumed that, due to editing, the tape will contain groups of rub-out signals representing non-justifiable lines, the suppression of transmission of which is a feature of the present invention. Therefore, the transmitter 11 embodies certain facilities for automatically sensing said rub-out signals to establish a condition whereby said rub-out signals are not transmitted. Instead a continuous marking condition is impressed on the line. Before transmitting these signals over the signal line 18 to the remote station, they are received by reperforator 14 through the medium of which a new tape 19 is prepared which is devoid of rub-out code signal combinations. The new tape 19 produced by the reperforator 14 is fed into the transmitter 13 by means of which signals are transmitted over the signal line 18 to the receiving station 21. At the receiving station the signals are received by the reperforator 21 by means of which a tape 22 is perforated which is identical to the tape 19 at the transmitting station. Tape 22 is then utilized to control the operation of a permutation code operated device such as disclosed in said Krum et al. Patent 2,091,286 associated with the typesetting or slug casting machine 16. By this method the typesetting machine at a remote receiving station may be controlled telegraphically and automatically by a distant transmitting station.

However, as previously mentioned, it is necessary in order to insure satisfactory operation of the system that the tape 19 at the transmitting station be properly prepared; that is, that the lines of composed matter perforated in the tape represent properly justifiable lines, and moreover that no rub-out signals appear in the tape, thus insuring no loss of line time during transmission. To achieve this feature of the invention, the arrangement shown in Fig. 2 is provided, wherein a tape sensing unit is generally designated by the reference numeral 31 and is adapted to receive a message tape 32 from any well known apparatus for preparing the tape. The tape sensing unit and the transmitting unit are only described to an extent necessary to comprehend the present invention since many other tape sensing and transmitting units may be used in conjunction with the present invention. For a more detailed description of the tape sensing and transmitting unit, attention is directed to the afore-identified Teletype Bulletin No. 141.

The tape 32 has formed therein by the perforating apparatus transverse sets of permutative apertures 33 which may in certain instances be six in number. The tape is further provided with feed holes longitudinally spaced therein. The tape is fed through the sensing apparatus by a feed wheel 34 mounted on a shaft 36. Secured to the shaft 36 is a ratchet 37 adapted to be actuated by a spring biased pawl 38 pivotally mounted on a feed lever 39. The feed lever 39 is oscillated to advance the pawl over the teeth of the ratchet 37 by a bail 41 pivotally mounted on a rod 42. Downwardly extending from the bail 41 is an arm 43 adapted to be engaged by an adjustable screw 44 which in turn is threadably mounted within an upturned end 45 of a follower 46. The follower 46 is pivotally mounted on a pin 47 and has, rotatably mounted on its opposite end, a roller 48 adapted to follow the periphery of the cam 49. Cam 49 is fixed to and adapted to rotate with a shaft 51.

The shaft 51 has mounted thereon a friction clutch 52 adapted to interconnect the shaft 51 with a spur gear 53. The spur gear 53 is engaged by worm 54 continually rotated by any suitable electric motor 56. Secured to the shaft 51 is a disc 57 having extending therefrom a stop lug 58 adapted to cooperate with a stop lever 59.

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Controlling the position of the stop lever 59 is an electromagnet 61 adapted to be energized through a suitable circuit including a switch 62. Closure of the switch 62 completes the circuit for energizing the electromagnet 61 to withdraw the stop lever 59 from engagement with the lug 58 to permit power to be transmitted from the motor 56, through the worm 54, through the spur gear 53, through the clutch 52 to the shaft 51.

A transmitting unit generally designated by the reference numeral 63 comprises a commutator ring 64 and eight circumferentially spaced conductive segments or traversable elements 66 to 73, inclusive. The segments 67 to 71, inclusive, are connected through leads or conductors 74 to contacts 76. The segment 72 on the other hand is indirectly connected to one of the series of contacts 76, as will presently appear.

Secured to the shaft 51 is a brush or traversing means 77 adapted to span the commutator ring 64 and the segments 66 to 73 during each rotation of the shaft 51. Associated with each contact 76 is a contact arm 78 individually mounted in a pivoted fashion about a conductor rod 79. The positions assumed by the contact arms 78 are controlled by means of sensing levers 81 individually mounted in pivoted fashion on a shaft 82. Sensing levers 81 are bifurcated at their trailing ends for the reception of the free ends of the contact arms 78. Each sensing lever 81 is urged by a spring 83 to move in a counterclockwise direction about the shaft 82, however, such movement is prevented by depending arm 84 formed integral with each sensing lever 81 which arm 84 is adapted to be engaged and held in position by the bail 41. In addition, each sensing lever is provided with a sensing pin 85 adapted to probe and ascertain if any apertures 23 are positioned in alignment with the sensing pins.

Turning now to a consideration of the elements comprising the present invention, it will be observed that, as previously mentioned, the segment 72 is connected indirectly to one of the series of contacts 76. Having reference to Fig. 2, the segment 72 is connected by a conductor 86 to a contact 87 of a slow-to-release relay 88. The winding of relay 88 is, in turn, connected by a conductor 89 to its associated contact of the series of contacts 76. Confronting the series of contacts 76 and positioned on the opposite sides of the contact levers 78 is a corresponding series of spacing contacts 91 connected by a conductor 92 to the winding of a line closing relay 93. Relay 93 is provided with an armature 94 which is connected to positive battery, and cooperates with a contact 95 to connect said battery over a conductor 96 to the signal line conductor 97 at junction 98. The signal line extends from positive battery 103, over shaft 79, over conductor 99, through stop segment 73, over brush 77, through ring 64, over signal line conductor 97, through the receiving magnet 101 at the remote receiving station 102, and thence to ground 104.

In the normal rest or non-transmitting condition of the arrangement shown, a marking condition (current) is impressed on the signal line previously traced from positive battery 103 to ground 104. Under a predetermined condition of operation, the signal line through the transmitting segments 66 to 73 and ring 64 is short circuited under the control of the line closing relay 93, as will presently appear. When the rotation of shaft 51 is initiated, as previously described, the cam 49 thereon causes, through lever 46, the bail 41 to oscillate to thereby rock the sensing levers 81, to effect a tape sensing operation. If a perforation is presented above a sensing pin 85, then the associated sensing lever 81 is permitted to rock counterclockwise under the action of spring 83 to impart clockwise rotation to the associated contact lever 78 to close the associated contact 76. This represents a marking condition and is instrumental in causing a marking impulse to be transmitted over the signal line,

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over a circuit extending from positive battery 103 through shaft 79, through operated contact lever 78, through closed marking contact 76, over conductor 74, through one of the segments 67 to 71, over brush 77, through ring 64 and over signal line 97 to ground, as previously traced. However, if the right-hand marking contact of the series of contacts 76 is closed, the circuit from battery 103 is not completed on the signal line 97 directly, but instead the circuit extends from closed contact 76, over conductor 89 and through the winding of slow release relay 88 to negative battery. Relay 88, upon operating, will close its contact 87 to impress positive (or marking) current on the signal line 97 through segment 72. The reason for the introduction of slow release relay 88 in connection with this segment 72 (which is identified with the last impulse of the code signal, not including the start and the stop impulses) is to hold a marking battery on segment 72 to permit an earlier withdrawal of the sensing pins 85 from the apertures 33, as will presently be explained.

It will be recalled that the spacing contacts 91 (which are held closed when no apertures are found or sensed by the spacing pins 85) are all connected in parallel to the line closing relay 93 in such manner that in normal character-code sensing operations, at least one spacing contact 91 will be closed. This will hold the line relay 93 operated over a circuit extending from positive battery 103, through rod 79, over at least one contact lever 78, through at least one contact 91, over conductor 92 and through the winding of relay 93, which, in turn, maintains its contact 95 opened to thus remove the holding battery 105 from the signal line through junction 98. Therefore, the only time that the operating battery 103 is removed from the line closing relay 93 is when all of the spacing contacts 91 are opened simultaneously, or in other words, when all of the marking contacts 76 are closed simultaneously. This latter condition occurs in response to the sensing of an all-marking signal condition in the tape; that is, when a condition is sensed by the sensing pins 85 wherein all the possible code positions in a transverse row are perforated. These all-marking signals are also known as rub-out signals, as hereinbefore alluded to, and are utilized to delete or eliminate unwanted message matter, as exemplified herein by non-justifiable lines of composition perforated in the tape.

Having reference to Fig. 3, line 111 represents the timing diagram for cam 49 in a transmitter employed in general telegraphic communication, as disclosed in the aforesaid Teletype Bulletin No. 141. Pursuant to this condition of operation, the brush 77 in rest or stop position normally contacts the stop segment 73 substantially at line 110. According to said diagram 111, the withdrawal of the sensing pins 85 under said condition of operation begins at point 112 immediately following the traversal of brush 77 over the last segment 72 to insure a full opportunity to impress the last codal impulse (exemplified by segment 72) on the signal line. The pins 85 are fully withdrawn from the tape 32 at point 113 which is substantially in the center of the stop interval (exemplified by stop segment 73). Then, the pins are returned to tape sensing or probing relation with the tape 32 at point 114, which is well into the start interval, exemplified by start segment 66. In general telegraphic transmission, this is permissible because the start interval is a no-current interval, the effect of which, as is well known in the art, is to initiate the operation or rotation of the receiving selector. Now, in accordance with the present invention, it is desired to prevent the initiation of the receiving selector (or, in other words, prevent the cycling of the receiver) when rub-out signals are sensed in the tape. This is achieved by adjusting the position of the brush arm 77 (and hence, cam 49) with respect to the stop segment 73 so that the brush 77 now contacts the stop segment 73 sub-

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stantially at line 120. Under this condition of operation the withdrawal of the sensing pins 85 will begin at point 115 shown on diagram 116, which point is substantially central of the last impulse interval, exemplified by segment 72. Then the pins 85 are fully withdrawn early in the stop interval, at point 117, and returned to the tape sensing position (upon initiation of the next cycle) within the stop interval, at point 118. Thus, it is observed that if the pins 85 are withdrawn before brush arm 77 traverses fully the segment 72, then contact 76 associated therewith will be opened too soon, and marking current for segment 72 would be cut-off prematurely. However, to compensate for the curtailing or shortening of the last code signal impulse due to this earlier withdrawal of the sensing pins 85, the relay 88 is introduced, as previously described, to connect a new source of marking current (battery 106 instead of battery 103) to the segment 72. Then, as soon as battery 106 takes command, the pins 85 can be withdrawn without curtailing or shortening the last intelligence (code) impulse. Of course, as the time of withdrawal and return of pins 85 is adjusted, as exemplified by timing diagram 116, the operation of contacts 76 will also be adjusted correspondingly, as exemplified by timing diagram 122.

As previously described, during normal cyclic operation of the transmitter shown in Fig. 2, at which time, at least one of the spacing contacts 91 would be closed to effectuate the energization of the line closing relay 93, battery 105 would be precluded from taking command of the line 97 because contact 95 would be held open. Also, as previously mentioned, when rub-out signals are sensed, the battery 103 is removed from the line closing relay 93 causing it to de-energize and thereby permitting the holding battery 105 to be applied to the line 97 through contact 95 during the interval required for one complete revolution of the transmitter brush 77. Then with a continuous succession of rub-out signals in the tape, the marking condition on the line will be continuous so long as rub-out (all marking) signals are sensed in the tape by sensing pins 85. It is important, however, that the line closing relay 93 operate before the start impulse is generated, otherwise the transmission of the start pulse (through segment 66) of spacing nature will cause the receiving units to cycle and perforate an all-marking signal. According to the present invention, this cycling of the receiving units during suppression of rub-out signals is prevented. To achieve this result, the marking current impulses impressed on the signal line 97 through segment 72 is controlled by the slow release relay 88, by insuring that the marking current on said segment 73 is maintained while the sensing pins are being withdrawn.

The aforementioned adjustment of the brush arm 77 with respect to the segment 73 is required because successful operation of rub-out suppression according to the present invention requires that the decision to close the line (release the relay 93) be made before the brush arm 77 enters the start segment 66. That is, the line closing relay 93 must be de-energized before the brush arm 77 contacts the start segment 66; otherwise, an open line condition (start pulse condition) will occur which will cycle the receiving unit (in other words initiate its operation). This condition is illustrated in Fig. 4, wherein line 125 represents the operating cam 49. Under present conditions, an all-marking condition is not sensed until the brush 77 has reached the point 126, approximately 12° late in the cycle. Therefore, up to that time (indicated by point 126) the relay 93 is energized and battery 105 cannot take command of the line 97. However, with the cam 49 adjusted, as exemplified by diagram 127, the rub-out signal is sensed at point 128, approximately 22° early, considering point 129 as the datum. Concomitantly with this, the segment 72 has its marking condition established at point 131

in one cycle and extended to point 132 in the immediately succeeding cycle due to the slow release relay 88.

It is to be understood that the above-described arrangement of apparatus and circuits and the construction of the elemental parts are merely illustrative of the application of the invention and many other modifications may be made without departing from the invention.

What is claimed is:

1. In combination, a signal line, a tape transmitter, means to sense a tape, means to transmit over said signal line permutation code signals according to the setting of said tape sensing means, auxiliary line-current control means responsive to a predetermined setting of said tape sensing means to preclude for a predetermined period transmission of predetermined code signals, said auxiliary line-current control means effective to take command of said signal line automatically upon sensing said predetermined code signals and a further line-current control means also effective in response to said predetermined setting to insure for a predetermined additional period the preclusion of transmission of said predetermined code signals.

2. In a tape controlled transmitter, means for generating signals, means for sensing permutations of indicia in the tape for controlling the signal generating means, auxiliary means controlled by said sensing means, said auxiliary means comprising an impulse controlled relay and a normally unactuated line closing relay controlled by said sensing means, a first shunt circuit controlled by said impulse controlled relay, and a second shunt circuit controlled by said normally actuated line closing relay, said relays effective under the control of said sensing means in response to a predetermined permutation of indicia in said tape for rendering said shunt circuits dually effective to shunt said signal generating means, whereby said signal generating means is rendered ineffective.

3. In combination, a signal line, a code tape transmitter comprising a single row of a predetermined number of tape sensing instrumentalities, sensing control means individually relatable to said instrumentalities, contacts individually identifiable with and controlled by said sensing control means, means for operating said sensing control means cyclically, means for distributing signal impulses over said signal line according to the marking or spacing condition of said instrumentalities, said distributing means comprising traversable elements severally related to corresponding ones of said contacts, signal line closing means effective in response to a predetermined condition of said instrumentalities to control the closing of said signal line irrespective of the operation of said distributing means, and means operably associated with one of said instrumentalities and its corresponding contact to insure the application of a marking condition on the traversable element corresponding to said one of said instrumentalities to facilitate the effectiveness of said signal line closing means.

4. In combination, a signal line, a code tape transmitter comprising a single row of a predetermined number of tape sensing instrumentalities, sensing control means individually relatable to said instrumentalities, contacts individually identifiable with and controlled by said sensing

control means, means for operating said sensing control means cyclically, means for distributing signal impulses over said signal line according to the marking or spacing condition of said instrumentalities, said distributing means comprising traversable elements severally related to corresponding ones of said contacts, traversing means cooperable in predetermined timed relation with said traversable elements, signal line closing means effective in response to a predetermined condition of said instrumentalities to control the closing of said signal line irrespective of operation of said distributing means, and means operably associated with one of said instrumentalities to insure the application of a marking condition on the traversable element corresponding to said one of said instrumentalities to render jointly with said traversing means said signal line closing means effective.

5. In combination, a signal line, a code tape transmitter comprising a single row of a predetermined number of tape probing instrumentalities, probing control means individually relatable to said instrumentalities, contacts individually identifiable with and controlled by said probing control means, means for operating said probing means cyclically, means for distributing signal impulses over said signal line according to the marking and spacing condition of said instrumentalities, said distributing means comprising traversable elements severally related to corresponding ones of said contacts, traversing means cooperable in predetermined timed relation with said traversable elements, signal line closing means effective in response to a predetermined condition of said instrumentalities to control the closing of said signal line irrespective of the operation of said distributing means, and means comprising a slow-to-release relay operably associated with one of said instrumentalities and its corresponding contact, said relay effective during the operation of said distributing means to insure for a predetermined period the application of a marking condition on the traversable element corresponding to said one of said instrumentalities to facilitate the effectiveness of said signal line closing means.

6. In a tape controlled transmitter, means for generating signals, means for sensing permutations of indicia in the tape for controlling the signal generating means, auxiliary means controlled by said sensing means, said auxiliary means comprising an impulse controlled relay and a normally unactuated slow-to-release relay controlled by said sensing means, a first shunt circuit controlled by said impulse controlled relay, and a second shunt circuit controlled by said slow-to-release relay, said relays effective under the control of said sensing means in response to a predetermined permutation of indicia in said tape for rendering said shunt circuits dually effective to shunt said signal generating means, whereby said signal generating means is rendered ineffective.

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