

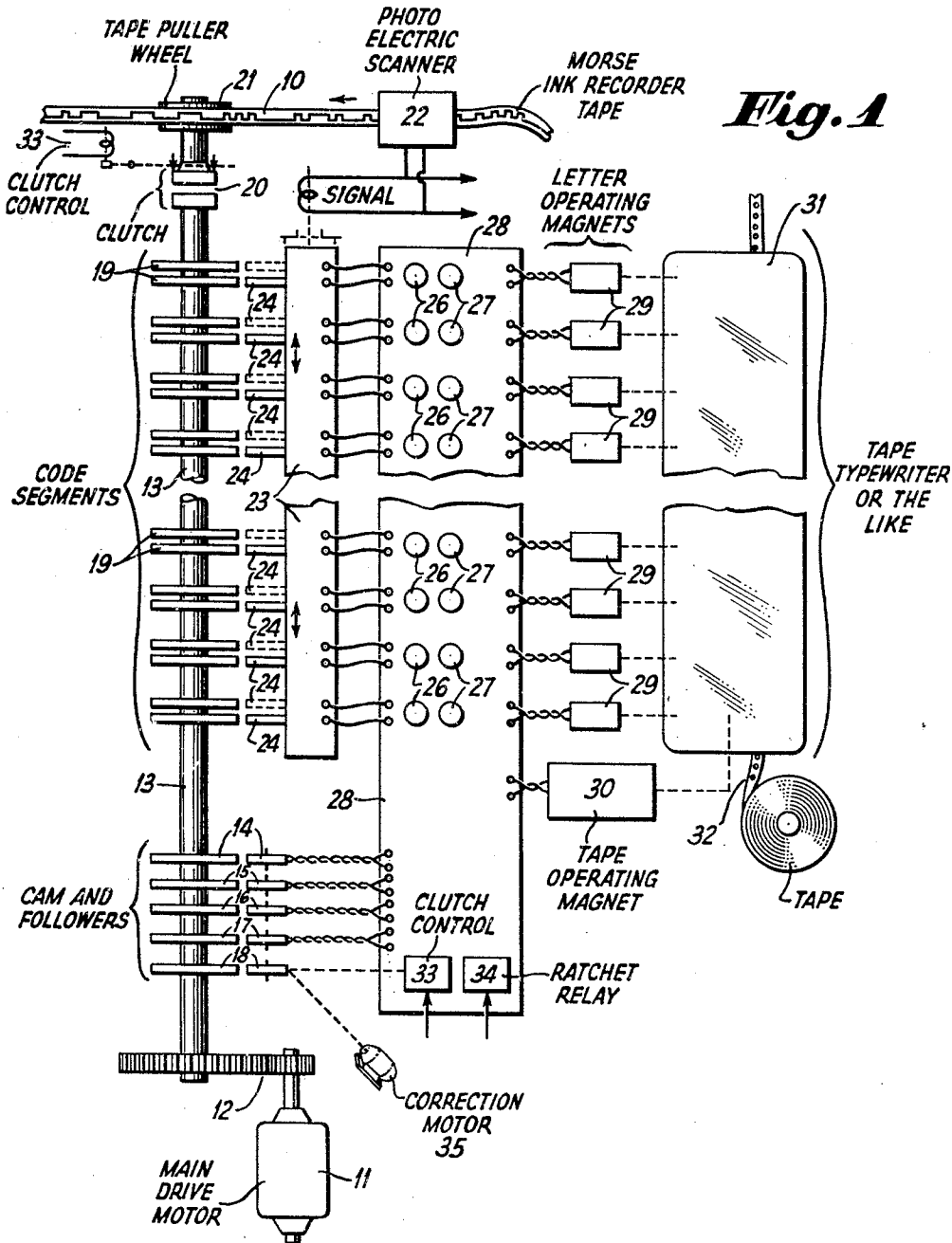
Feb. 21, 1950

J. L. FINCH  
CODE PRINTER

2,497,936

Filed Oct. 18, 1946

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

*Fig. 2*

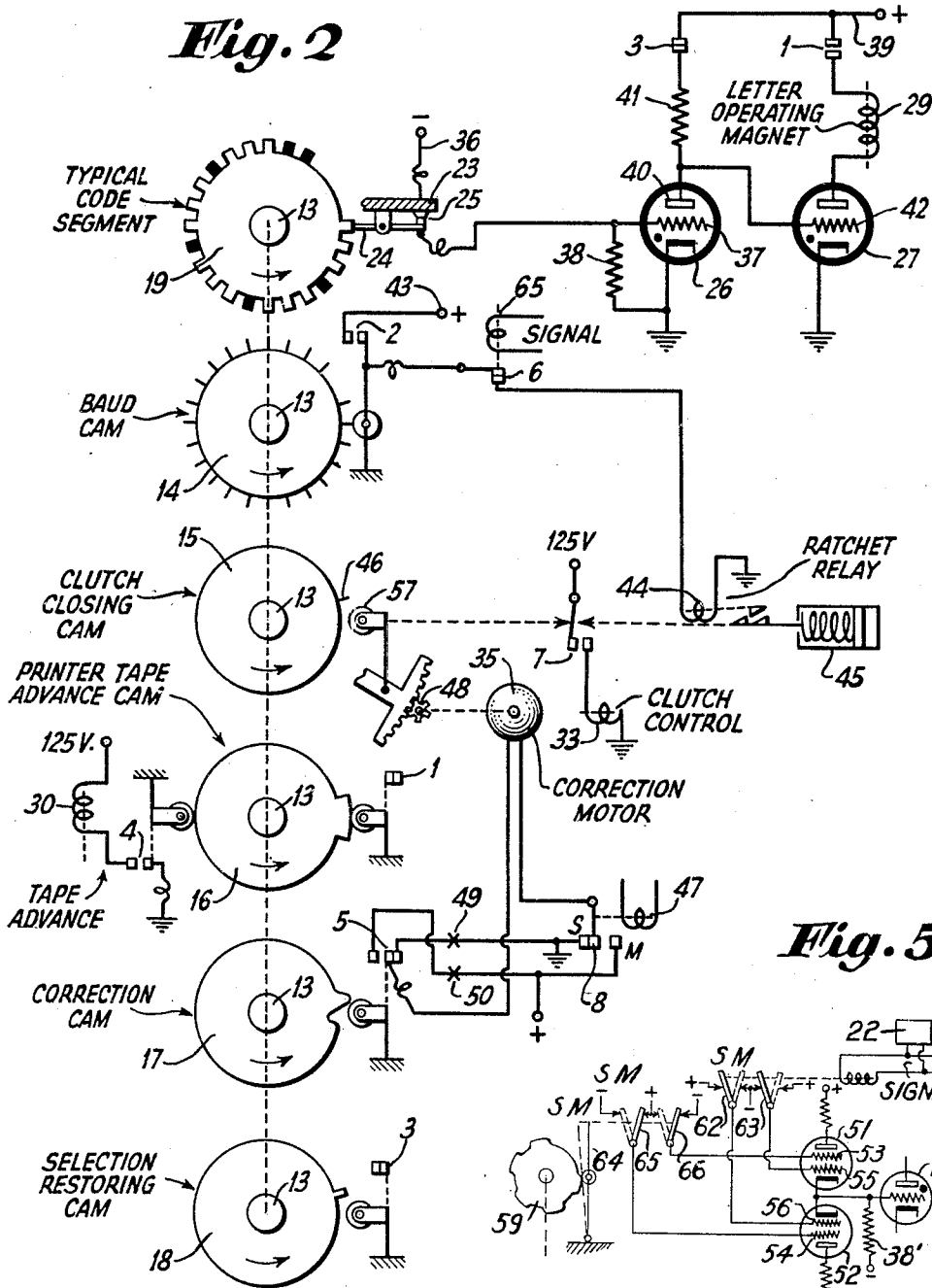
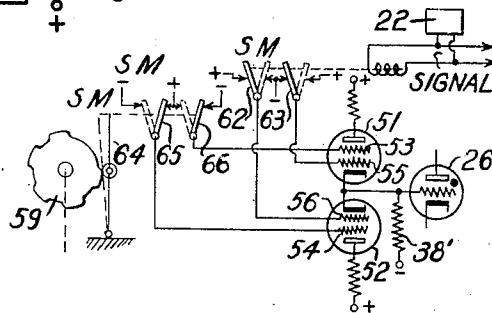


*Fig. 5*



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3 Sheets-Sheet 3

*Fig. 3*

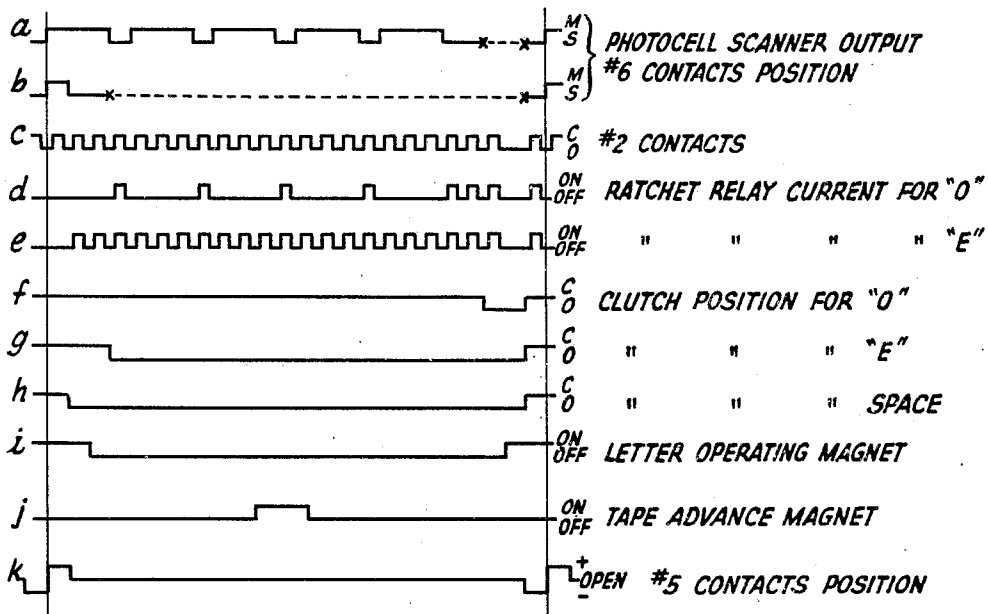
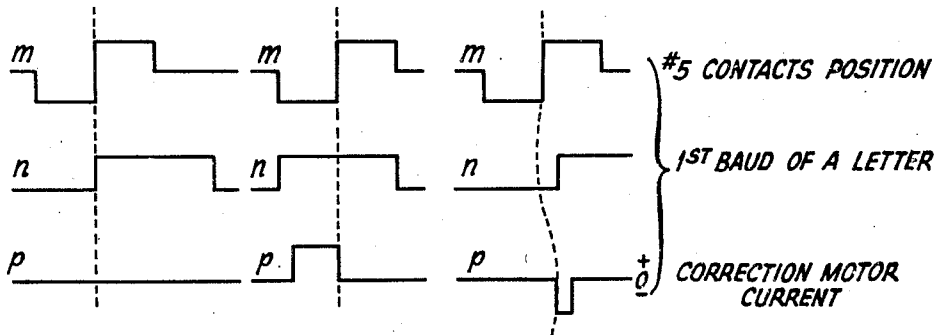


*Fig. 4a Fig. 4b Fig. 4c*



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## UNITED STATES PATENT OFFICE

2,497,936

## CODE PRINTER

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Application October 18, 1946, Serial No. 704,155

15 Claims. (Cl. 178—23)

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This invention relates to telegraphic printing systems and more particularly to a system for automatically operating a telegraph printer or the like from a source of printed code signals.

It is customary in telegraph printing systems to store the incoming signals until such time as it is desired to translate them or utilize them for retransmission. Storage means of various types are well known in the art and may take the form of ink recorders, perforated tapes, telegraphones or the like. The signals thus stored are then utilized to actuate a local transcribing mechanism or for retransmission purposes. Various means for accomplishing the translation of the signals have been designed.

It is an object of this invention to provide an improved system which will be entirely automatic in its operation and which will require a minimum number of moving parts.

More specifically, it is an object of this invention to provide automatic means for scanning printed signals and utilizing the outputs from the scanned signals to actuate corresponding output circuits.

Briefly, in accordance with the invention, the printed signals are scanned by a device which produces correspondingly varying electrical voltages. These voltages are combined with a plurality of locally generated signal voltages corresponding to the characters to be translated. The locally generated voltages and the signal output voltages are combined in equal strength 180° out of phase whereby a current flow will be produced during some period of their combination in each character circuit save the circuit corresponding to the signal being received. These currents are utilized to block a source of power to the output circuits.

For purposes of illustration, a single embodiment of the invention has been selected in which it is assumed that International Morse signals have been printed on a tape by an ink recorder. These signals are photoelectrically scanned and the output circuits mentioned are used to actuate the character operating magnets of a tape typewriter. It is to be understood that the above assumptions are made not by way of limitation, since many of the features of this invention could be used for operating from recorder tape other than the ink recorder variety and from codes other than International Morse code. Similarly, the invention could be used to actuate a perforator or printer perforator instead of a tape typewriter or the equivalent apparatus.

The above and other objects and advantages of

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the invention will be clear upon a consideration of the following detailed description taken in conjunction with the accompanying drawings, in which:

Figure 1 represents schematically the chosen embodiment of the invention;

Figure 2 is a detailed drawing illustrating the operation of the cams and contacts and the circuits controlled thereby illustrated in Figure 1;

Figure 3 represents a series of curves illustrative of the output currents in the circuits of Figure 1;

Figure 4a represents the output currents from the correction cam when the locally generated currents and the signal currents are in phase;

Figure 4b represents the output currents of the correction device when the spacing bauds are too short;

Figure 4c represents the output currents of the correction device when the spacing bauds are too long; and

Figure 5 represents a modification of an element of the invention.

Throughout the drawings, like parts are designated by like numerals. For the purpose of simplifying the drawing, it will be noted that in Figure 2 certain of the cam operated contacts have been shown in relation to their position in the circuits which they control as well as in relation to the cam by which they are operated. In such case it is to be understood that only one pair of contacts is actually in the system.

Referring to Figure 1 it will be seen that there has been provided a tape 10 carrying International Morse signals which have been printed thereon by any suitable device, such as an ink recorder. The main motor 11 drives, through suitable gears 12, a shaft 13 upon which are mounted a plurality of cams 14, 15, 16, 17 and 18, a plurality of code segments 19 and an electrically actuated clutch 20. The clutch drives the tape puller wheel 21 for advancing the tape 10. The tape puller wheel 21 pulls the tape 10 past a photocell scanner 22. The output of the photocell scanner will be referred to as the signal.

The signal operates a bar 23 upon which are mounted contact fingers 24. One such contact finger is provided for each pair of code segments 19. These are drawn in the figure with solid lines in their spacing position and with dotted lines in their marking position.

Each of the contact fingers controls through suitable contacts a gas filled triode 26 which in turn controls a second gas filled triode 27. These tubes together with their control circuits are

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arranged within the rectangle 28. The above referred to contacts, tubes, etc., control the character operating magnets 29 and the tape advancing magnet 30. The tape typewriter 31 prints on tape 32 which is fed from a standard tape reel. Within the rectangle 28 there is also shown the clutch control apparatus 33 and a ratchet relay control circuit 34. There is also shown a correction motor 35, the purpose of which will appear later.

Referring to Figure 2 the cams 14, 15, 16, 17, 18, and a typical pair of code segments 19 together with their associated control circuits are shown. It will be understood that similar contacts 24 and their associated control circuits are provided for each of the code segments 19. Code segment 19 has been chosen to represent the figure "0." This segment actually consists of two disks shown one behind the other, the elements on the marking disk being shown as hollow squares while the elements of the spacing disk are shown as solid squares. Associated with the code segment is shown, in section, the bar 23 carrying a contact finger 24 which in turn actuates a contact 25. The contact 25 opens and closes a circuit between a source of negative grid bias 36 and the control grid 37 of gas triode 26. A suitable grid leak 38 is placed between the control grid and the cathode of tube 26 and the cathode is grounded. The negative grid bias 36 which is applied to the grid of gas triode 26 is sufficient to block tubes 26. A plate supply 39 is fed to the plate 40 of gas triode 26 through contacts 3 which are normally closed and a suitable line resistor 41. The output of tube 26 leads to the control grid 42 of its corresponding gas triode 27. The cathode of gas triode 27 is grounded and the output circuit fed through its corresponding character operating magnet 29. The plate supply for gas triode 27 is fed through normally open contacts 1.

Baud cam 14 has arranged around its edge 23 points which open contacts 2 at the middle of each baud interval except one. These contacts are connected serially with a source of operating power 43, contacts 6, the winding 44 of ratchet relay 34, and ground. It will be seen that contacts 6 are arranged to be operated by the signal through relay 35. The ratchet relay is equipped with some suitable device such as a pneumatic chamber 45 which allows it to respond quickly but causes it to return slowly. Actuated by the ratchet relay 34 is contact 7, the tongue of which is so arranged that it stays in the position in which it is left. Thus after it is opened by the ratchet relay 34, it will stay open until it is closed by the point 46 on the clutch closing cam 15. The printer tape advance cam 16 is arranged to close contacts 1 in the plate circuit of gas triode 27 so that the character operating magnet 29 may be energized during a particular portion of the shaft rotation. It also closes contacts 4 which energizes the tape advance magnet 30 at the proper time.

The selection restoring cam 18 opens contacts 3 in the plate circuit of gas triode 26 for a moment, once for each revolution of the shaft 13. Correction cam 17 operates contacts 5. These contacts cooperate with contacts 8 of relay 41 actuated in turn by the signal currents. The correction motor 35 drives gears 48 to advance or retard the roller 57 on cam 15 to determine the time when the clutch is to be engaged. Limit switches 49 and 50 are provided to prevent over correction beyond the useful range of the correction device.

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In Figure 3 curves *a* through *k* are drawn to represent one revolution of shaft 13. Curves *a* and *b* illustrate the photocell scanner output and the position of contacts 6 for figure "0" and letter "E," respectively. They also indicate by the dotted lines between the *x*'s the intervals during which the tape is stationary. It will be noted that in each case the tape stops at the end of the second spacing baud interval which terminates a character and starts again one baud interval before the beginning of the next character. Curve *c* represents the action of contacts 2. Curves *d* and *e* represent the ratchet relay currents for characters "0" and "E," respectively. It will be noted that two successive pulses of this current occur immediately following the last marking signal of the characters. As will appear, this causes the clutch to be controlled and to take the positions shown in curves *f* and *g* for the characters "0" and "E," respectively. Curve *h* illustrates the clutch position versus time for a "space" interval. It will be noted that the recorder tape is advanced two baud intervals for a space interval, thus allowing for the space between words. Curves *i* and *j* illustrate the intervals during which the character operating magnet current is on and the tape advance magnet current is on, respectively. Curve *k* represents the position of contacts 5.

The operation of this invention may best be understood by reference to Figures 1, 2 and 3. It will be assumed that one character has been printed and shaft 13 is in a position about one baud interval earlier than the position shown in Figure 2. Let us also assume that the next character is figure "0." Contacts 1 have been closed for the actuation of the previous letter operating magnet. As cam 15 advances contacts 7 are closed by its action and the clutch is engaged. This starts the tape advance and the photocell scanner 22 scans the tape 10 to produce the signal currents shown in curve *a*, Figure 3. The bar 23 is moved to the marking position when the first marking character starts. This allows the code elements represented by the hollow squares on cam 19 to pass contact finger 24. At the end of the third marking baud interval bar 23 moves back to the spacing position and this allows the fourth baud code element represented by the solid square on the code segment 19 to pass. As the shaft advances the code elements for figure "0" are so placed that the contact finger 24 will not be touched and contacts 25 will not be opened. However, each and every other of the contact fingers 24 is, at some point during the scanning of this character, interfered with by one or more code elements. When contacts 25 are opened for any character, tubes 26 break down or fire thus biasing tubes 27 so that they cannot break down. Thus tubes 27 for all characters except figure "0" are biased beyond cut-off. Contacts 25 for character "0" were not opened so that tube 26 is blocked and tube 27 is not biased and is ready to carry current.

At the end of the twenty-second baud interval after the code selection has taken place for all figures contacts 1 will be closed by the action of cam 16 and current will flow through the letter operating magnet 29 for the figure "0" and through the one unblocked tube 27, thus causing the character "0" to be printed. After current has been established in tube 27 selection restoring cam 18 momentarily opens contacts 3. This interrupts the current in tubes 26 and sets them up ready for the next character. The continued

rotation of cam 16 opens contacts 1 interrupting the current in tube 27 and setting it up for the next character.

The spacing between the marking elements of figure "0" do not result in any action on contacts 7 since the ratchet relay is arranged so that contacts 7 will not open unless the ratchet is advanced twice in succession at baud frequency. However, the second spacing baud following the last marking character causes the ratchet relay 45 to advance and open contacts 7, opening the clutch 20 through the clutch control relay 33. This stops the recorder tape 10 temporarily. When shaft 13 arrives at the last baud position before that shown in Figure 2 cam 15 moves roller 57 which closes contact 7 and restarts the tape advance. When it has advanced one space corresponding to a baud interval the first marking corresponding to the next character is scanned and the above action repeated.

The action of the correction device may best be understood by reference to Figure 2 and Figures 4a, 4b and 4c. This device is required to compensate for inaccuracies in the lengths assigned to correspond to a baud interval on the Morse ink recorder tape. If these baud lengths are slightly less than that for which the tape puller wheel 21 is designed then the tape advance will have to start later, while if the baud length is too great the tape advance will have to start earlier. Curves *m*, *n* and *p* illustrate the action of the correction device. These curves represent an enlarged portion of curve *k* of Figure 3. Curves *m*, *n* and *p* in Figure 4a correspond to the condition when the baud length on the tape is correct. It will be seen that when the tongue of contacts 5 closes on the ground side relay 47 is closed on the spacing side which is also its ground side. When the tongue on contacts 5 is moved to the positive voltage side the signal moves the tongue of contacts 8 to the marking side which is also the positive voltage side. Thus no current will be passed to the correction motor 35. When the baud lengths are too short, as is shown by curves *m*, *n* and *p* in Figure 4b, the tongue of contacts 8 is on its marking side for an interval while the tongue of contacts 5 is on its ground side. Thus a positive current will flow through the correction motor 35. When the bauds are too long, as is shown by curves *m*, *n* and *p* in Figure 4c, the tongue of contacts 8 is on the spacing side for an interval while the tongue of contacts 5 is on the positive voltage side. Thus a negative current flows through the correction motor. The motor is so arranged to turn in the direction required to delay the start of the tape advance when the baud lengths are too short and to advance the start of the tape advance when they are too long. The correction motor 35 drives gears 48 to advance or retard the roller 57 actuated by cam 15 and thus determines the time when the clutch is to be engaged.

It is possible to replace the code bar device 23 as described above with a semi-electronic device. Such modification is shown in Figure 5 illustrating circuit components replacing code segments 19, bar 23, contact fingers 24, and contacts 25. Here instead of rendering grid 37 of tube 26 positive by removing bias as in the arrangement of Fig. 2, a positive voltage is applied to grid 37 by means of a pair of vacuum tubes 51 and 52 associated with each code character. The screen grids 53 and 54, respectively, of these two tubes have impressed upon them code signals corresponding to the particular character for which

they are to work, which local signals are generated by a plurality of code wheels having signals corresponding to the code elements of the character which they represent. This modification requires a mechanical code wheel to be mounted on drive shaft 13 for each of the code combinations desired just as was required for the code signals of Fig. 1. The typical code wheel 59 shown in Fig 5 again represents the figure "0." A cam follower arm 64 is arranged to follow code wheel 59 the full lines indicating its position when the local signal elements are marking and the broken lines indicating its position for spacing elements. Two switch tongues 65 and 66 are mechanically linked to cam follower 59 and are electrically connected to grids 53 and 54 of tubes 51 and 52 respectively, the voltage being impressed upon one of them being reversed from that impressed on the other. Similarly, the control grids 55 and 56 of these two tubes would have the photocell scanner output impressed on them, one being reversed from the other by means of switch tongues 62 and 63. When the photocell scanner signal output applied to the grids corresponds to the code signals applied to the screen grids the voltage applied to the control grids would be opposite to that applied to their screen grids throughout that character and no current would be passed in either tube. However, when this is not the case one tube or the other would carry current at some time during the character. This will result in tube 26 breaking down and from there on the action would be the same as described above.

What is claimed is:

1. In a telegraph system utilizing stored code signals, means for generating code signal characters, a plurality of output circuits, means for supplying power to said output circuits, blocking means for each of said output circuits responsive to current flow, and means applying a code signal to be translated and said generated characters to all said blocking means except one in equal strengths 180° out of phase whereby only one of said output circuits is operative.
2. In a telegraph system, apparatus for translating intelligence expressed in a given code, including a plurality of cams having configurations corresponding to the natures of the individual code elements of the individual characters of said code, means to synchronize the operation of said cams with the characters of said intelligence to be translated, cam followers associated with each of said cams to produce a voltage varying in accordance with the individual elements of the characters of said given code, a plurality of output circuits corresponding to the individual characters of said code, output blocking circuits associated with each of said output circuits, means to apply operating potential to said blocking and said output circuits, means responsive to the individual elements of the characters of said intelligence to energize said blocking circuits when the nature of the individual code elements of said code cams differs from the nature of the corresponding code element of said intelligence character to block the associated output circuit, whereby only one of said output circuits remains operative.
3. In a telegraph system, apparatus for translating intelligence expressed in a given code, including a plurality of cams having configurations corresponding to the natures of the individual code elements of the individual characters of said code, means to synchronize the operation of

said cams with the characters of said intelligence to be translated, cam followers associated with each of said cams, means associated with said cam followers to produce voltages varying in accordance with the individual code elements of the characters of said code, a plurality of output circuits corresponding to the individual characters of said code, blocking means associated with each of said output circuits, a control device coupled to each of said blocking means, said device being responsive to the individual elements of the characters of said code under consideration to energize said blocking means when the nature of the individual code elements of said code cams differs from the nature of the corresponding code element of said intelligence character to block the associated output circuit, whereby only one of said output circuits remains operative.

4. In a telegraph system, apparatus for translating intelligence expressed in a given code, including a plurality of cams having configurations corresponding to the natures of the individual code elements of the individual characters of said code, cam followers associated with each of said cams, synchronous means to shift said cam followers in accordance with the nature of the individual code elements of the intelligence to be translated, a plurality of output circuits corresponding to the individual characters of said code, output blocking circuits associated with each of said output circuits, means to apply operating potential to said blocking and said output circuits, energizing means associated with said cam followers arranged to energize said blocking circuits when the nature of the individual code elements of said code cams differs from the nature of the corresponding code element of said intelligence character to block the associated output circuit, whereby only one of said output circuits remains operative.

5. In a telegraph system, apparatus for translating intelligence expressed in a given code, including a plurality of pairs of cams having complementary configurations corresponding to the natures of the individual code elements of the individual characters of said code, cam followers associated with each of said pairs of cams, means synchronously to shift said cam followers with respect to the cams of each of said pairs in accordance with the individual code elements of the intelligence to be translated, a plurality of output circuits corresponding to the individual characters of said code, output blocking circuits associated with each of said output circuits, means to apply operating potential to said blocking and said output circuits, energizing means associated with said cam followers arranged to energize said blocking circuits when the nature of the individual code elements of said pairs of code cams differs from the nature of the corresponding code element of said intelligence character to block the associated output circuit, whereby only one of said output circuits remains operative.

6. In a telegraph system, apparatus for translating intelligence expressed in a given code, including means to establish code potentials corresponding to the individual elements of the characters of said code, said potentials varying in sign in accordance with the nature of the individual elements of said characters, means responsive to the elements of the characters of said intelligence to establish signal voltages varying in sign in accordance with the nature of the individual elements of said intelligence, means to

synchronize the establishment of said potential and said voltages, a plurality of output circuits corresponding to the individual characters of said code, blocking means for each of said output circuits, means to apply said code potentials and said signal voltages to said blocking means to block the associated output circuits when the nature of the individual elements of said code characters differs from the nature of the corresponding elements of the intelligence character under consideration whereby only one of said output circuits is operative.

7. In a telegraph system, apparatus for translating intelligence expressed in a given code, including means to establish code potentials corresponding to the individual elements of the characters of said code, said potentials varying in sign in accordance with the nature of the individual elements of said characters, means responsive to the code elements of said intelligence to establish signal voltages varying in sign in accordance with the nature of the individual code elements of said intelligence, said voltages and said potentials being established in synchronism, a plurality of output circuits corresponding to the individual characters of said code, blocking means for each of said output circuits responsive to current flow, means to apply said code potentials and said signal voltages to said blocking means to produce current flow and block the associated output circuits when the nature of the individual elements of said code characters differ from the nature of the corresponding elements of said intelligence character under consideration whereby only the one of said output circuits corresponding to the character under consideration is operative.

8. In a telegraph system, apparatus for translating intelligence expressed in a given code, including means to establish code potentials corresponding to the individual elements of the characters of said code, said potentials varying in sign in accordance with the nature of the individual elements of said characters, and being synchronized with the elements of the characters of said intelligence under consideration, means responsive to the elements of the characters of said intelligence to establish signal voltages varying in sign in accordance with the nature of the individual elements of said intelligence, a plurality of output circuits corresponding to the individual characters of said code, an output blocking circuit for each of said output circuits responsive to current flow, a control circuit associated with each of said blocking circuits, means to apply said code potentials and said signal voltages to said control circuits to energize said output blocking circuits when the nature of the individual elements of said code characters differ from the nature of the corresponding elements of said intelligence character under consideration whereby only the one of said output circuits corresponding to the character under consideration is operative.

9. In a printing telegraph system, a printer for translating intelligence expressed in a given code, including a tape carrying printed characters of said code, means for scanning said printed characters to produce voltages corresponding to the individual elements of said characters, said voltages varying in sign in accordance with the nature of the individual elements of said characters, means to establish potentials corresponding to each of the characters of said given code, said potentials varying in sign in accord-

ance with the nature of the individual elements of said characters, a plurality of output circuits corresponding to the individual characters of said code, blocking means for each of said output circuits, means to apply said potentials and said voltages to said blocking means to block the associated output circuits when the nature of the individual elements of said code characters differs from the nature of the corresponding elements of the printed character under consideration whereby only the one of said output circuits corresponding to the character under consideration is operative.

10. In a telegraph system, apparatus for translating intelligence expressed in a given code, including an output circuit for each character of said code, blocking means for each of said output circuits responsive to current flow, means to produce voltages of polarity in accordance with the nature of the individual elements of the character of said intelligence under consideration, means to apply said voltages to each of said blocking means, a code cam having a configuration corresponding to the individual elements of the code character which it represents for each of the characters of said code, means associated with each of said code cams to establish potentials of given sign to the associated blocking means when the elements of each character are of one nature and to reverse the sign of said potentials when the elements are of opposite nature, the operation of said code cams being synchronized with the character of said intelligence under consideration, said voltages and said potentials being applied to said blocking means in sign relationship to alter current flow only by application of potentials and voltages having polarities representing character elements of different nature to block the respective output circuit whereby only the one of said output circuits corresponding to the character of said code under consideration is operative.

11. In a telegraph system, apparatus for translating intelligence expressed in a given code, including an output circuit for each character of said code, blocking means for each of said output circuits responsive to current flow, a control circuit for each of said blocking means, means to produce signal voltages in accordance with the nature of the individual elements of the character of said intelligence under consideration, means to apply said signal voltages to each of said control circuits, a code cam having a configuration corresponding to the individual elements of the code character which it represents for each of the characters of said code, means associated with each of said code cams to establish potentials of given sign to the associated control circuits when the elements of each character are of one nature and to reverse the sign of said potentials when the elements are of opposite nature, said potentials being produced in synchronism with said voltages, said voltages and said potentials being applied to said control circuit in sign relationship to alter current flow only by application of voltages and potentials representing character elements of different nature to block the respective output circuit whereby only the one of said output circuits corresponding to the character of said code under consideration is operative.

12. In a telegraph system, a printer for translating intelligence expressed in a given code, including an output circuit having a grid controlled gaseous discharge device coupled to the corre-

sponding actuating magnet of said printer for each character of said code, an output blocking circuit having a further grid controlled gaseous discharge tube coupled to the control grid of the associated output circuit, a control circuit for each of said blocking circuits, said control circuits each comprising a pair of electron discharge devices, connected in parallel, each having two control grids in series relationship between cathode and anode electrodes, switch means responsive to the character of said intelligence under consideration to produce voltages of one sign when the individual elements of said code character are of one nature and to produce voltages of reverse sign when the elements are of opposite nature, a code cam having a configuration corresponding to the individual elements of the code character which it represents for each of the characters of said code, switching means associated with said code cam to establish potentials of one sign when the individual elements of the code characters are of one nature and to establish potentials of reverse sign when the elements are of opposite nature, means to apply said voltages to corresponding control grids of said electron discharge devices, and means to apply said potentials to the other control grids of said electron discharge devices to prevent current flow in each of said control circuits when the individual elements of each character under consideration are of the same nature as that of the elements of the character to which the control circuits correspond whereby the associated output blocking circuit is inactive and the associated output circuit remains operative to actuate the corresponding printer magnet.

13. In a telegraph system, a printer for translating intelligence expressed in a given code, including an output circuit having a grid controlled gaseous discharge device coupled to the corresponding actuating magnet of said printer for each character of said code, an output blocking circuit having a further grid controlled gaseous discharge tube coupled to the control grid of the associated output circuit, a control circuit for each of said blocking circuits, said control circuits each comprising a pair of electron control devices connected in parallel and each having two control elements in series relationship, switch means responsive to the character of said intelligence under consideration to produce voltages of given polarity when the individual elements of said code character are of one nature and to reverse the polarity of said voltages when the elements are of opposite nature, a code cam having a configuration corresponding to the individual elements of the code character which it represents for each of the characters of said code, switching means associated with said code cam to establish potentials of one polarity when the individual elements of the code characters are of one nature and of reverse polarity when the elements are of opposite nature, means to apply said voltages to corresponding control elements of said devices, and means to apply said potentials to the other control elements of said devices to prevent current flow in each of said control circuits when the individual elements of each character under consideration are of the same nature as that of the elements of the character to which the control devices correspond whereby the associated output blocking circuit is inactive and the associated output circuit is operative to actuate the corresponding printer magnet.

14. In a telegraph system, apparatus for trans-

lating intelligence expressed in a given code, including a plurality of cams having configurations corresponding to the natures of the individual code elements of the individual characters of said code, means to synchronize the operation of said cams with the characters of said intelligence to be translated, cam followers associated with each of said cams, electric contacts cooperatively associated with said cam followers, a plurality of output circuits corresponding to the individual characters of said code, output blocking circuits associated with each of said output circuits, means to apply operating potential to said blocking and said output circuits, circuitry interconnecting said electric contacts and said operating potential means and said blocking circuits to energize said blocking circuits when the nature of the individual code elements of said code cams differs from the nature of the corresponding code element of said intelligence character to block the associated output circuit, whereby only one of said output circuits remains operative.

15. In a telegraph system, apparatus for translating intelligence expressed in a given code, including a plurality of cams having configurations corresponding to the natures of the individual code elements of the individual characters of said code, means to synchronize the operation of said cams with the characters of said intelligence to be translated, cam followers associated with each of said cams, electric contacts associated with

said cam followers, a plurality of output circuits corresponding to the individual characters of said code, blocking means associated with each of said output circuits, control circuitry intercoupling each of said blocking means and each of said electric contacts and arranged to energize said blocking means when the nature of the individual code elements of said code cams differs from the nature of the corresponding code elements of said intelligence character to block the associated output circuit, whereby only one of said output circuits remains operative.

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