

March 19, 1935.

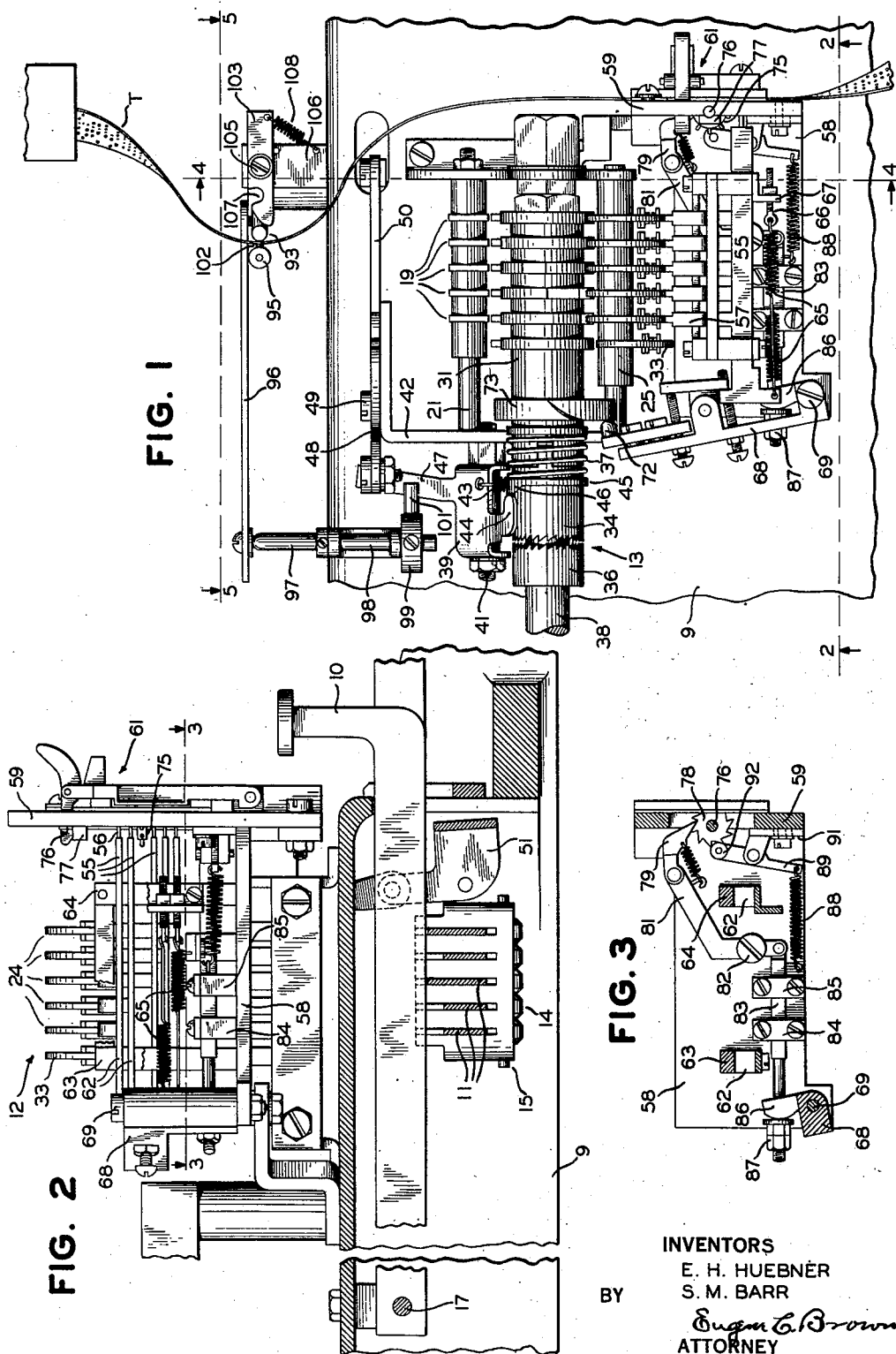
E. H. HUEBNER ET AL

1,994,949

TELEGRAPH TRANSMITTING APPARATUS

Filed March 23, 1933

2 Sheets-Sheet 1



INVENTORS

E. H. HUEBNER

S. M. BARR

BY

Eugene C. Brown
ATTORNEY

March 19, 1935.

E. H. HUEBNER ET AL

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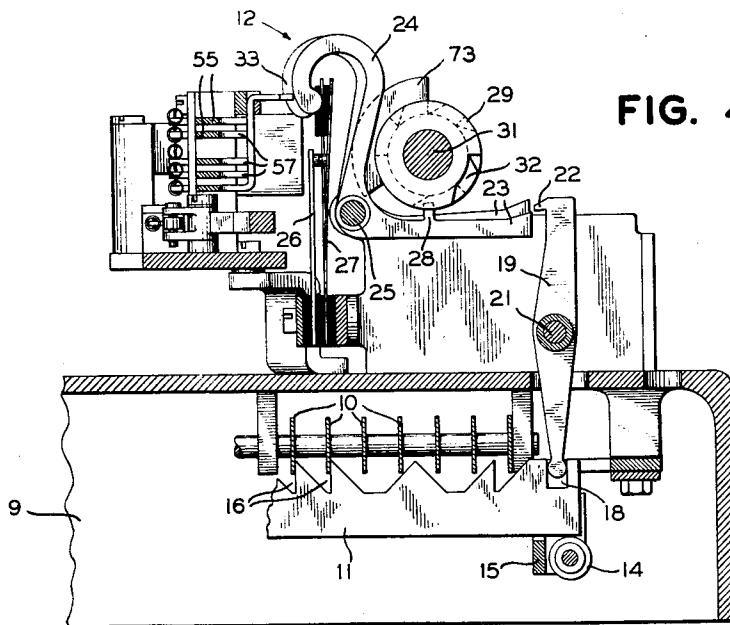


FIG. 4

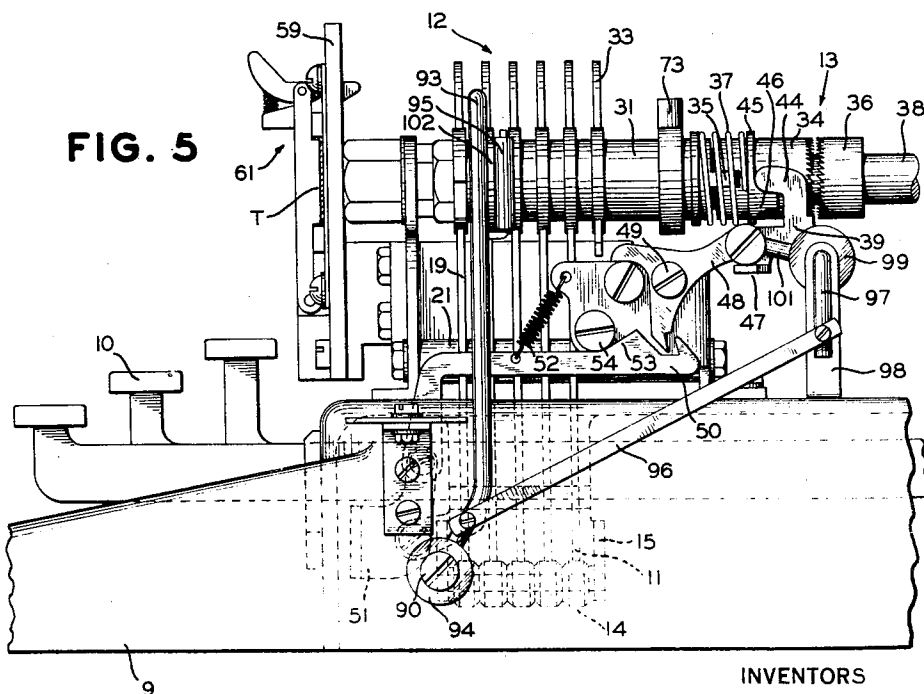


FIG. 5

INVENTORS

E. H. HUEBNER

S. M. BARR

BY

Eugene C. Brown
ATTORNEY

UNITED STATES PATENT OFFICE

1,994,949

TELEGRAPH TRANSMITTING APPARATUS

Ernest H. Huebner and Samuel M. Barr, New York, N. Y., assignors to The Western Union Telegraph Company, New York, N. Y., a corporation of New York

Application March 23, 1933, Serial No. 662,370

8 Claims. (Cl. 178—17)

This invention relates to telegraph transmitting apparatus and in particular to a tape transmitter attachment or adapter unit to be combined with a keyboard transmitter.

The principal object of this invention is to provide an arrangement whereby a tape transmitter of economical design may be combined with a keyboard transmitter so as to form a single compact unit instead of widely spaced separate units as in ordinary transmission.

Another object is to assemble the transmitter adapter unit on a standard printer so as to permit transmission of tape controlled signals without interfering with the alternate use of keyboard transmission over the same circuit.

Still another object is to interrelate the tape transmitter mechanism and the keyboard transmitter mechanism so that they may have a maximum number of parts in common and to be operable from a common source of power.

Other objects and advantages of this invention will appear from the following description taken in connection with the accompanying drawings, in which:

Fig. 1 is a plan view showing the arrangement of the keyboard transmitter cam shaft with the tape transmitter adapter unit applied thereto;

Fig. 2 is a side view taken on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken along line 3—3 of Fig. 2 showing the tape feed mechanism;

Fig. 4 is a sectional view taken along line 4—4 of Fig. 1;

Fig. 5 is a side view taken along line 5—5 of Fig. 1 showing the mechanism for stopping the tape transmitter.

Referring first to Figs. 2, 4 and 5, the mechanism for direct keyboard transmission will be described without reference to the tape transmitter adapter unit.

The keyboard transmitter consists of a suitable base 9 forming a support for the operating mechanism, which comprises a bank of key levers 10, a number of notched code bars 11, disposed so as to be engaged by the key levers when depressed, a set of contacts generally indicated at 12, operated in succession by the transmitting cam assembly, to transmit predetermined combinations set up thereon by the depression of the various key levers, and a clutch 13 through which the cam assembly and contact mechanism are driven from a source of power, not shown.

The code or selector bars 11, usually five in number, are mounted within the base 10 of the machine on rollers 14 set in a guide block 15

carried by the under side of the base. These code bars are positioned beneath the key levers and extend across the width of the keyboard. They are provided with triangular notches 16 arranged, according to the requirements of the signal code, so that they will be moved either to the right or left when the depressed key levers strike the slanting sides of the notches. These key levers are pivoted on a bar 17 extending the width of the machine and are normally held in position above the code bars by a series of springs, not shown.

At the right hand end of each selector bar, as viewed in Fig. 4, there is a slot 18 in which the lower end of a vertical locking latch 19 is set. The latch 19 is pivoted on a horizontal shaft 21 so that when the corresponding code or selector bar is moved to the right the upper end of the locking latch will latch over the horizontal arm 23 of a contact lever 24 pivoted on a shaft 25 and prevent the upward movement of the same. When the selector bars are moved to the left the projection 22 is moved out of the path of the horizontal arm 23 permitting it to rock upwardly if it is otherwise free to do so.

The contact lever 24, one of which is provided for each selector bar, has a hooked upper end engaging one 27 of a pair of contacts 26 and 27. The contact levers, in combination with the locking latches, control the transmitting contacts 26 and 27, which are normally held open by their contact levers against the tension of the spring contacts 27.

The horizontal arm 23 of each contact lever has a hump 28 thereon engaging the edge of individual cams 29 mounted on a shaft 31. Each cam has a depression 32 on its surface, which, when opposite the hump 28, permits the lever 24 to rock counterclockwise so as to allow the contacts 26 and 27 to close, provided the levers 24 are not engaged by their corresponding locking latches 19. The cams 29 are arranged on the shaft 31 in such angular relation to each other that as they revolve the depressions 32 come opposite the humps 28 in succession. By permitting certain contacts to close and others to remain open, the desired character signal is formed.

In addition to the contacts and contact levers corresponding to the selector bars there is an additional contact lever 33 and operating cam, the function of which is to transmit a "start" and "stop" impulse preceding and following the signal combination.

The cam shaft 31 is normally at rest and is permitted to make one revolution by means of the ratchet clutch 13, for each signal combination

set up. The driven ratchet 34 of the clutch is keyed to the cam shaft by a key and slot 35 and is moved longitudinally into engagement with the driving ratchet 36 by a clutch spring 37. The driving ratchet 36 is rigidly fixed to the driving shaft 38 which in turn is geared to the motor, not shown. The clutch faces are normally held out of engagement by a clutch stop-arm 39 pivoted at 41 (Fig. 1) to a bracket 42. The stop-arm 39 has a horizontal and a vertical extension, the latter being normally held against the driven clutch member 34 by action of a spring 43 and having a curved upper end 44 which extends into the path of a collar 45 of the driven ratchet 34. The collar 45 has a cam face 46 which when engaged by the curved end of the stop arm 44 moves the driven ratchet 34 away from the driving ratchet 36 thus disengaging the clutch.

The horizontal extension 47 of the stop arm is engaged by a lever 48 pivoted at 49 to a right angle extension of the bracket 42. The lever 48 is operated by a trip pawl 50 carried by the upper arm of a universal bar 51 (Fig. 5) extending beneath each of the key levers so as to be engaged thereby, whenever a key is depressed. The trip pawl 50 is normally held upwardly against the lower end of the lever 48 by a spring 52 and as the universal bar 51 is rocked the pawl 50 is pulled forwardly, tripping the lever 48, which in turn rocks the stop arm 39 so as to move the extension 44 out of engagement with the cam face 46 and permit engagement of the clutch 13. As the pawl continues its forward movement, the cam face 53 thereof engages a pin 54 forcing the rear end of the pawl downwardly out of engagement with the lever 48, thereby permitting the stop arm 39 to return against the collar 45, so as to disengage the clutch at the end of a revolution.

The contacts 26 of the distributor are all connected to marking or line battery and the spring contacts 27 are connected to the line. Consequently, as the contacts are closed or held open in succession, marking or spacing signals are transmitted. The operation of the mechanism so far described is as follows:

Upon the depression of a key lever 10 to shift the code bars 11 either to the right or left, the projections 22 of the locking latches 19 move over or away from the horizontal arms 23 of the contact levers 24, as the case may be, in a predetermined code arrangement, and at the same time the clutch 13 is engaged through the manipulation of the universal bar 51 and its associated mechanism to rotate the cam shaft 31 one revolution.

As the cam shaft starts to rotate the depressions 32 on the cams 29 are successively brought opposite the humps 28 of the contact levers 24 to permit the same to rock about the shaft 25 and thereby close the contacts 26 and 27, unless they are restrained from doing so by the locking latches 19, thus transmitting marking and spacing signals to the line.

The foregoing transmitting mechanism by itself forms no part of the present invention except insofar as it is interrelated to the tape transmitting attachment about to be described.

The transmitter adapter unit, best illustrated by Figs. 1 and 2, consists of a suitable base plate 58 supported in a horizontal position above the main base 9 adjacent to the contact levers 24 and having secured to its front edge at right angles thereto a vertical plate 59 extending upwardly

to support the tape guide mechanism generally indicated at 61.

The selector bars 55, one of which is provided for each unit of the code, extend forwardly, parallel to the cam shaft 31 and are arranged one above the other to slide in slotted guides 62 cut in the sides of two uprights 63 and 64 integral with the base plate 58. The selector bars are substantially T-shaped, the top of the T extending toward the back of the machine, one shoulder of each T having secured thereto one end of a spiral spring 65 which extends forwardly in substantial alignment with the corresponding selector bar and is anchored at its forward end to an adjusting pin 68 carried by a bracket 67 secured to the upright 64 and serving to hold the selector bars in their guides. A separate adjusting pin is provided for each spring. It will be noted that the springs 65, of a predetermined size, are staggered so that when placed close together one spring does not interfere with the springs to either side thereof.

The selector bar 55 has projecting from the right side thereof an arm 57 extending outwardly, then upwardly, and again outwardly in stepped arrangement, the extremity of which moves in a horizontal path across the face of the hooked upper end of its corresponding contact lever 24 and out of engagement with the same whenever the selector bar pin 56 projects forwardly through a perforation in the tape. Thus, whenever a perforation in the tape is positioned opposite one of the selector bar pins 56, the latter is permitted to project through the tape and at the same time the end of the arm 57 moves forward out of engagement with the contact lever 24 permitting the same to rock on its pivot 25, closing the contacts 26 and 27 and sending marking battery to the line.

The pins 56 are moved backwardly away from the tape against the action of the springs 65 by a lever 68 pivoted at 69 to the base plate 58 and having an adjustable plate 71 suitably mounted thereon so as to extend vertically across and engage the remaining shoulder of each of the T-shaped selector bars 55. The lever 68 has projecting forwardly from its free end a pin 72 engaging the rear face of a cam 73 mounted on the cam shaft 31. The cam is cut so as to give a reciprocating motion to the lever 68 for each revolution of the cam shaft, allowing the pins 56 to be urged forwardly by the springs 65 against or through the perforated tape and withdrawing the same so that the tape may be stepped forward one character.

Normally the pin 72 rests against the face of the cam 73 and the selector bars 55 are pulled back so that the pins 56 are withdrawn from the tape. As a key lever is depressed, releasing the stop-arm and permitting engagement of the clutch 13, the shaft 31 begins to rotate. As it rotates the lever 68 moves forward, permitting the selector bar pins to enter perforations in the tape.

The remaining cams on the shaft 31 successively permit the contacts 26 and 27 to close if they are free to do so. A rise on the cam then forces lever 68 backward again and the pins are withdrawn from the tape. At the same time the tape is fed forward one space so that the next code combination is in line with the pins 56. The tape feed mechanism will now be described. It is best illustrated by Fig. 3.

A star wheel 75 having a peripheral row of radial pins serves to feed the tape forward, the pins entering a center row of perforations of the

tape, as is well known in the art. The star wheel 75 is mounted upon a vertical shaft 76 journaled at the bottom in the base plate 58 and at the top in a lug 77 projecting from the vertical plate 59. Also mounted upon the shaft 76 is a ratchet wheel 78 arranged to be advanced step-by-step by a spring actuated pawl 79 mounted upon a lever 81 pivoted at 82 to the base plate 58.

The other end of the lever 81 is pivoted to one end of a sliding bar 83 mounted in guide blocks 84 and 85 secured to the base plate 58. The other end of the bar 83 passes through a yoke 86 formed on the lower portion of lever 68 and has an adjusting nut 87 at the end thereof which engages the rear face of the yoke 86. As the lever 68 is moved backward by reason of the pin 72 engaging the cam 73, the bar 83 is pulled backward against the action of a spring 88, one end of which is secured to a pin projecting from the forward end of the bar. This causes the lever 81 to move in clockwise fashion to advance the feed-wheel 75 one step, such action occurring once for each revolution of the cam shaft 31. The other end of the spring 88 is secured to one end of a lever 89 pivoted on a lug projecting from an adjustable plate 91 fastened to the tape guide plate 59. The other end of the lever 89 carries a jockey roller 92 to prevent reverse movement of the ratchet wheel 78 when the pawl 79 is pulled backwardly to engage the next adjacent tooth, and to accurately position the tape with the perforations directly in line with the transmitting pins.

Referring to Figs. 1 and 5 the auto-control mechanism for stopping the rotation of the cam shaft 31 of the transmitter, when the tape supply becomes exhausted, will now be described.

It consists of a bar 93 mounted on a collar 94 pivoted at 90 to the base 9, said bar being curved at the lower end and joined to the collar at a point to the rear of a vertical line drawn through the center of the pivot so that a turning moment is created tending to move the bar 93 in a clockwise direction. To increase this effect a weight 95 is secured to the upper end of the bar by a hooked pin. To the lower end of the bar 93 near the collar, is pivoted one end of a connecting link 96, the other end being connected to a crank 97 journaled in the ends of a U-shaped bracket 98 fastened to the base 9. The other end of the crank 97 has an adjustable collar 99 thereon from which projects a pin 101. The end of the pin 101 is normally positioned directly over the horizontal extension 47 of the stop-arm 39.

The tape perforator and tape transmitter are usually placed in such a position that the tape leaving the perforator is in line with the tape as it enters the transmitter. The tape passes through the slot 102 formed between the bar 93 and the weight 95 and prevents the bar from moving clockwise about the pivot 90. It is evident that the bar 93 will be responsive to any slack that may be formed in the tape.

When the perforator is idle the tape will have very little slack and the bar 93 will be in a vertical position. The pin 101 will be raised out of contact with the stop-arm whereby the clutch 13 is held disengaged. As soon as the perforator starts feeding the tape forward a loop is formed and the bar 93 moves backwards due to the weight 95, causing the crank 97 to turn and the pin 101 to press down on the horizontal extension of the stop-arm, thus throwing the vertical extension 44 out of engagement with the cam face 46 and permitting engagement of the clutch 13 to start the cam shaft revolving.

When the perforator ceases to function the transmitter will continue to operate until all the slack in the tape is taken up, at which time the bar 93 will be in a vertical position and the pin 101 will move upward permitting the stop-arm to disengage the clutch again.

A catch 103 is provided to hold the bar forward when the keyboard transmitter is being used so that it will not interfere with the operation of the clutch 13 under control of the key levers.

The catch 103 is pivoted at 105 to a bracket 106 fastened to the side of the main base 9. The rear end of the catch has an indentation 107 into which the bar 93 is pushed against the action of a spring 108 which is secured at one end of the bracket 106 and at the other end to the opposite side of the catch 103.

It will be noted that we have provided an attachment for a standard keyboard transmitter which utilizes to a large extent the transmitting mechanism of the keyboard transmitter including the cam shaft assembly, the start-stop mechanism therefor and the associated transmitting contacts. The added mechanism required to convert the keyboard transmitter into a tape control transmitter consisting primarily of tape feed mechanism, the tape pins, the reciprocating means for the tape pins and the auto control. This attachment may be applied to the keyboard transmitter without modification thereof with exception to the addition of the operating cam 73 to the cam shaft assembly. By its provision the operator may transmit either by means of the keyboard or by means of the perforated tape, the change from one type of transmission to the other being substantially instantaneous. For instance, when keyboard transmission is desired the tape is removed and the tape lever 93 is drawn forwardly into engagement with the latch 103. In this position the keyboard may be operated to transmit over the line. When tape transmission is desired the tape lever 93 is released from the latch and the tape inserted into the tape guideway with the feed perforations in mesh with the star wheel 75.

It will be obvious, of course, that various changes may be made in the mechanical details without departing from the essential features of the invention and, therefore, we do not desire to be limited to the specific mechanism shown and described but contemplate variations thereof as will occur to those skilled in the art.

What we claim is:

1. A tape transmitting attachment for a keyboard transmitter having a plurality of contacts released for closure in succession and keyboard mechanism for restraining selected ones of said contacts from closure in accordance with telegraph code signals, said attachment comprising a tape feeding mechanism, a plurality of tape engaging pins each corresponding to an individual one of said contacts, means for reciprocating said pins away from and towards said tape to position the same in accordance with the perforations in the tape and individual means associated with each of said pins for restraining the corresponding ones of said contacts from closure in accordance with the position of said pins.

2. A tape transmitting attachment for a keyboard transmitter having a plurality of contacts, a pivoted operating member for each of said contacts, said operating members being released for operation in succession and keyboard mechanism for restraining selected ones of said members from operation in accordance with telegraph code

signals, said attachment comprising a tape feeding mechanism, a plurality of tape engaging pins each corresponding to an individual one of said contacts, means for reciprocating said pins away from and towards said tape to position the same in accordance with the perforations in the tape and individual means associated with each of said pins for restraining the corresponding ones of said members from operation in accordance with the position of said pins.

3. A tape transmitting attachment for a keyboard transmitter having a plurality of contacts, a pivoted operating member for each of said contacts, said members being released for operation in succession, means under the control of a keyboard mechanism for engaging one end of said pivoted members for restraining selected ones thereof from operation in accordance with telegraph code signals, said attachment comprising a tape feeding mechanism, a plurality of tape engaging pins, means for reciprocating said pins away from and towards said tape to position the same in accordance with the perforations in the tape and means associated with said pins for engaging the opposite ends of said pivoted members for restraining predetermined ones thereof from operation in accordance with the position of said pins.

4. In combination, a keyboard transmitter having a plurality of contact closing members, a keyboard, a start-stop cam shaft normally at rest and arranged to be released for a cycle of operation for each character transmitted from said keyboard, said cam shaft effecting the closure of said contacts in succession under the selective control of said keyboard, a tape transmitting mechanism comprising a tape feeding mechanism, a series of tape engaging pins adapted to be positioned in accordance with the perforations in the tape and means controlled by tape approaching the transmitter for causing said cam shaft to rotate continuously, said tape engaging pins serving to control a selective closure of said contacts under the action of said cam shaft.

5. In combination, a keyboard transmitter having a plurality of contact closing members, a keyboard, a start-stop cam shaft normally at rest and arranged to be released for a cycle of operation for each character transmitted from said keyboard, said cam shaft effecting the closure of said contacts in succession under the selective control of said keyboard, a tape transmitting mechanism comprising a tape feeding mechanism, a series of tape engaging pins adapted to be positioned in accordance with the perforations in the tape, means controlled by tape approaching the transmitter for causing said cam shaft to rotate continuously, said cam shaft during each cycle of operation thereof causing the operation of said

tape engaging pins and tape feeding mechanism to position the pins in accordance with a new combination, said pins serving when so positioned to control the selective closure of said contacts under the action of said cam shaft.

6. In combination, a keyboard transmitter having a plurality of contact closing members, a keyboard, a start-stop cam shaft normally at rest and arranged to be released for a cycle of operation for each character transmitted from said keyboard, said cam shaft effecting the closure of said contacts in succession under the selective control of said keyboard, a tape transmitting mechanism comprising a tape feeding mechanism, a series of tape engaging pins adapted to be positioned in accordance with the perforations in the tape, an auto control mechanism normally tending to release said cam shaft for continuous rotation and means for locking said auto control mechanism in inoperative position for releasing said cam shaft.

7. In combination, a keyboard transmitter having a plurality of contacts, a keyboard, a start-stop cam normally at rest and arranged to be released for a cycle of operation upon each actuation of said keyboard, said cam shaft effecting the operation of said contacts under the selective control of said keyboard, a tape transmitting mechanism, comprising a tape feed device, a series of tape engaging pins adapted to be positioned in accordance with perforations in the tape and an auto control mechanism controlled by tape approaching the tape transmitter, said auto control mechanism serving to release said start-stop cam shaft independently of said keyboard mechanism whenever a predetermined amount of slack occurs in the tape approaching the tape transmitter, whereby to effect operation of said contacts under the selective control of said pins.

8. In combination, a plurality of transmitting contacts, a lever individual to each contact and normally urged in a direction to close said contacts, means normally restraining said lever from movement in such direction, means for removing said restraint from said levers in succession whereby to permit said contacts to close, keyboard mechanism having selective restraining means movable into the path of movement of said levers to prevent movement thereof in said circuit closing direction and tape control mechanism, also having means independent of said selective restraining means selectively movable into position to restrain the movement of said levers in a circuit closing direction whereby said contacts may be closed selectively under the control of either said keyboard or tape control mechanism.

ERNEST H. HUEBNER.
SAMUEL M. BARR.