

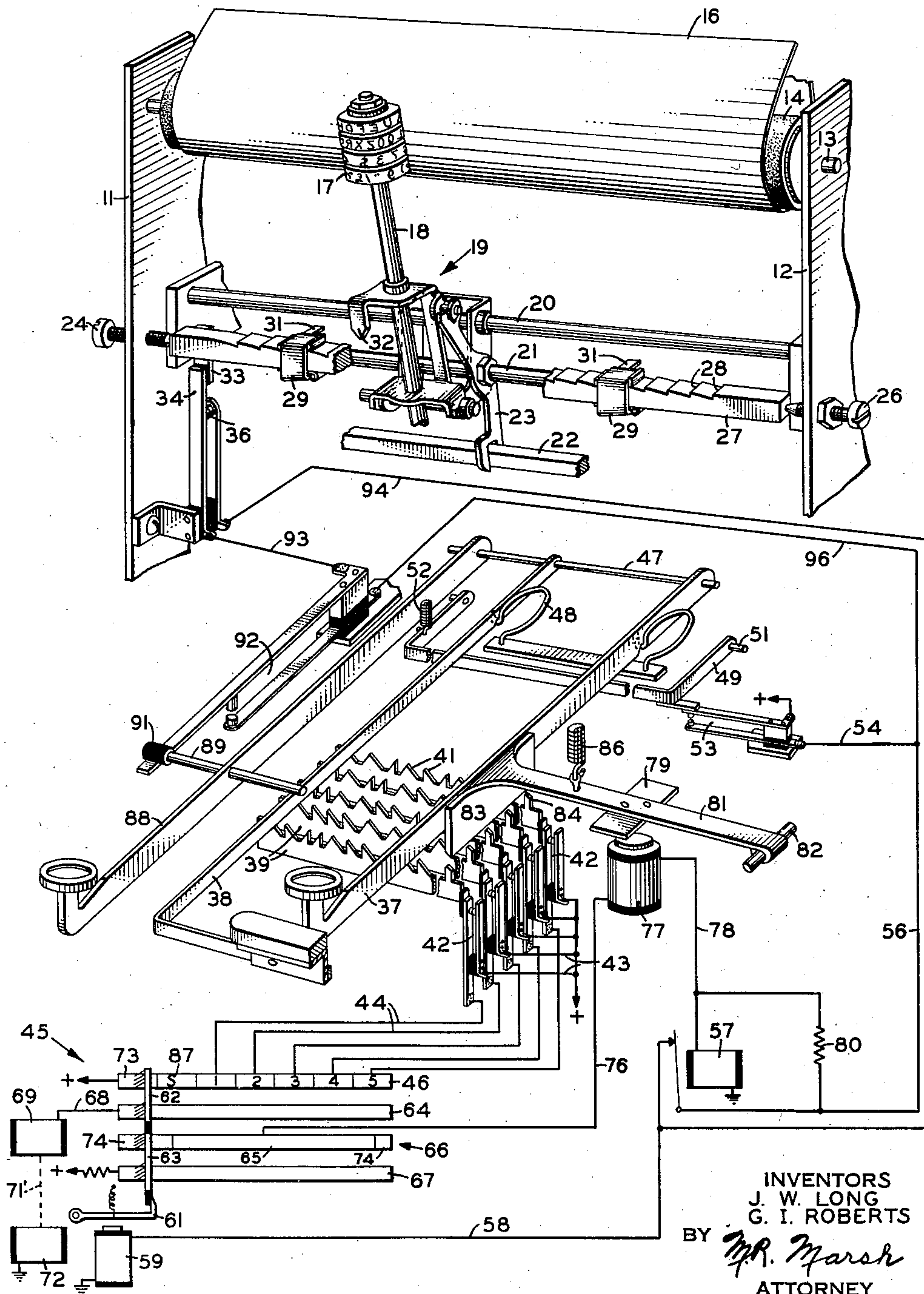
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J. W. LONG ET AL

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TELEGRAPH APPARATUS

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TELEGRAPH APPARATUS

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This invention relates primarily to telegraph printers and more particularly to a mechanism for attaching to telegraph printers of the page type to simplify the control thereof when it is desired to record characters in columns or in tabulated form on the recording paper.

In certain classes of telegraph services and especially those wherein telegraph page printers are employed as news and bulletin printers, it is oftentimes desirable to record some of the information, such as for example, prices and ranges of stocks, bonds and the like, in columns or in tabulated form to enable the ready reading and comparison thereof. Heretofore the usual manner of spacing the printing unit from one column to the next was for the transmitting operator to transmit the proper number of word spacing signals by successively actuating the word space keylever, the printing unit moving one word space on each operation of the word space keylever. Obviously with such an arrangement the transmitting operator has to count the number of word space signals transmitted between the columns or to watch the relative movement between the printing unit and platen on a pilot printer so as to cease transmitting further word space signals when the printing unit is opposite the beginning of the next column. This arrangement places somewhat of a burden on the transmitting operator and while being susceptible to error, also has the disadvantage of being likely to consume more line time in spacing the printing unit from one column to another than is absolutely necessary.

Accordingly, it is one of the primary objects of the present invention to provide an attachment for page type telegraph printers so that after completing the printing in one column, the printing unit may be automatically moved relative to the printing platen to stop in a predetermined stop position at the beginning of the next column.

In accordance with the above object it is a still further object of the invention to provide a transmitting arrangement for transmitting the necessary number of word space signals to move the printing unit relative to the platen so that the same will be stopped in the predetermined stop positions at the beginning of the columns.

Another still further object of the invention is to prevent the transmission of character selecting signals during the advancement or movement of the printing unit from one column to another in response to the word space signals.

Another still further object of the invention is to provide an improved and simplified keyboard mechanism.

A still further object of the invention resides in its simplicity and the minimum number of parts required to accomplish the above objects.

Another still further object of the invention resides in the ease with which it may be attached to printers of various types.

These and other objects and features of the invention will be more fully understood from the following detailed description thereof when taken in conjunction with the accompanying drawing which shows perspectively and diagrammatically the cooperating elements of a page printer and a keyboard together with the control circuits associated therewith and extending therebetween for accomplishing the above objects.

In accordance with the invention a notched bar pivotally supported at its ends in the printer extends across the same parallel to the direction of travel of the printing unit and has removably placed thereon a series of stops held in place by the notches on the bar. These stops are engageable with the printing unit at points in its travel determined by the location of the stops, to cause the notched bar to rock a slight amount about its ends. The transmitting mechanism associated with the printer is one of the usual keyboard type and has a special keylever which when actuated closes a circuit and causes the transmission of successive word space signals until the above mentioned circuit is opened by the rocking of the notched bar. The opening of the circuit stops the transmission of further word space signals and the printing unit will be in position to print the first character of a column. When the printing in this particular column is completed, the special key lever is again actuated and word space signals transmitted until the control circuit is again opened by the rocking of the notched bar on the printer by the printing unit.

In the drawing, elements of a page printer are shown which may be for example those of a stationary platen page printer of the type disclosed in a copending application of J. W. Long et al., Serial No. 299,672, filed September 13, 1938, with only those elements of the printer being shown as are thought necessary for a thorough understanding of the invention. Although elements of this particular type of printer are shown it will be obvious hereinafter that the principles of the invention could equally well be applied to practically any of the well known types of page printers, including those employing platens which are movable relative to the printing units, this particular one being chosen merely for the purpose of illustration.

As fully described in the above mentioned copending application the printer comprises left and right hand vertical mounting plates 11 and 12 respectively between which is mounted the printing mechanism of the associated printer. Extending horizontally between the vertical

plates 11 and 12 is a platen roller shaft 13 upon which is mounted for rotation therewith the printing platen 14. The recording paper 16 passes around the printing platen 14 and is held in frictional engagement therewith by pressure rollers (not shown) so that when the platen shaft 13 is rotated or stepped in accordance with predetermined functions of the printer, the recording paper 16 is advanced, the platen shaft 13 being rotated on each operation an amount sufficient to advance the paper 16 a distance equal to that between two successive lines of print on the recording paper. The printing unit of the printer comprises a type wheel 17 mounted at the upper end of a substantially vertical typewheel shaft 18. The typewheel shaft is carried in a typewheel car, indicated in general by reference numeral 19, which is slidable back and forth in a horizontal plane on horizontal rods 20 and 21 extending between the vertical plates 11 and 12. The printing operation is performed by moving a squared rod 22 toward the front which through a lever 23 on the typewheel car 19 causes the typewheel to be pressed against the recording paper 16 and platen 14. The typewheel car 19 is advanced from left to right in successive steps, the steps being in conjunction with each printing operation or during word spacing operations in which no printing operation is performed. The typewheel car 19 is returned for the beginning of a new line of print in one continuous movement in response to a typewheel car return signal or it may be accomplished automatically in conjunction with a line feed operation.

In accordance with the invention two trunnion screws 24 and 26 mounted horizontally in the vertical plates 11 and 12 respectively, pivotally support a notched bar 27 therebetween. The notched bar 27 has a series of notches such as 28 along the upper surface thereof and carried on the bar 27 are a series of movable stops 29 which are held in place along the length of the bar by the notches 28 therein. The stops 29 are placed on the bar 27 at the points where it is desired to begin the printing of a column and the number of such stops on the bar will usually determine the number of columns exclusive of the first column that will be printed on the recording paper 16. The stops 29 have extending horizontally from the rear thereof arms 31 which are normally in the path of a depending projection 32 of the typewheel car 19. As the typewheel car 19 moves across the paper 16, the depending projection 32 engages the arms 31 on the stops 29 and causes the bar 27 to pivot a slight amount in a clockwise direction when the typewheel car reaches a point opposite the stops. Fixed adjacent the left hand end of the bar 27 is a depending arm 33 which cooperates with the tongue 34 of a normally closed spring contact 36 to cause the contact to open when the bar 27 pivots in a clockwise direction as hereinbefore described. As the projection 32 of the typewheel car 19 moves out of engagement with the arm 31 on one of the stops 29, the tongue 34 of the contact 36 causes the bar 27 to pivot back into its normal position. The manner in which the contact 36 controls the movement of the typewheel car 19 so as to permit the recording in columns will hereinafter be described in conjunction with the description of an associated keyboard.

The keyboard employed to control the operation of the printer in accordance with the in-

vention while being somewhat of the usual construction in that it employs a plurality of keylevers which are operated one at a time to cause the transmission of a representative group of impulses has certain advantages thereover which will be hereinafter described. Only one character keylever 37 and the word space keylever 38 are shown, there being the usual number of other character keylevers similar to 37, only the one being shown for the sake of clearness. Located beneath the keylevers 37 and 38 and extending transversely thereof in the usual manner are a set of five permutation bars 39. The permutation bars 39 have extending from their upper sides beveled surfaces 41 which are adapted to cooperate with the lower edges of the keylevers when actuated and cause the permutation bars to be moved in the directions of their length in various combinations, which are representative of the keylevers actuated in a manner well known in the art.

In operative relation with the right hand end of the permutation bars 39 are a series of five sets of spring contacts 42, one individual to each of the permutation bars. When one of the permutation bars 39 is in its left hand position the associated contact 42 is allowed to open, and with the permutation bar in its right hand position the associated contact 42 is closed. Thus the contacts 42 are positioned in opened and closed conditions in accordance with the position of the permutation bars 39, which in turn are positioned in accordance with an operated keylever, such as 37. One of the springs of each of the sets of contacts 42 are connected in multiple by conductors 43 to potential, and the other springs of the contacts 42 are individually connected by individual conductors such as 44 to segments numbered 1 to 5 of a segmented ring 46. The segmented ring 46 comprises one of the four rings of a start-stop type distributor indicated in general by reference numeral 45, the operation of which will hereinafter be described.

The keylevers, such as 37 and 38, are pivotally mounted adjacent their rear ends of a rod 47, and springs such as 48 hold the forward ends of the keylevers in their normal elevated position. A universal bail 49 pivoted at 51 is held by a spring 52 in engagement with the undersides of each of the keylevers, such as 37 and 38, and is adapted to pivot a slight amount in a counterclockwise direction each time any one of the keylevers is actuated. A normally opened contact 53 has the tongue thereof associated with the universal bail 49 and is adapted to be closed by the pivoting of the universal bail. One side of the contact 53 has potential connected thereto and the other is connected by conductors 54 and 56 to the tongue of a relay 57. The back-stop of the tongue of relay 57 is connected by a conductor 58 through the coil of a magnet 59 to ground. Thus each time the universal bail is operated to close the contact 53, potential is applied over the above described circuit and through the coil of the magnet 59 to ground, to energize the same. The magnet 59 is the start magnet of the start-stop distributor 45 and has an associated spring biased armature 61, which when operated releases brushes 62 and 63 for movement over their associated rings. The brush 62 bridges the segmented ring 46 with an associated solid ring 64 and the brush 63 bridges rings 66 and 67.

The solid ring 64 of the start-stop distributor 45 is connected by a conductor 68 through the

coil of the selector magnet represented at 69 of the above described printer to control the same in accordance with the operation of the keyboard. This circuit may be extended by a conductor such as 71 through the coils of other printer controlling selector magnets such as 72 or it may be connected to operate a relay which in turn may control a number of page type printers. A segment 73 of the segmented ring 46 is connected to potential and in the stop position of the brush 62 this segment is bridged with the solid ring 64 and hence a closed line condition is maintained on the conductors such as 68 and 71 for the stop or rest position of the distributor 45. In the stop position of the distributor the brush 63 bridges the solid ring 67 which has potential connected thereto with an open segment 74 of the ring 66. Another segment 65 of the ring 66 is connected by a conductor 76 through the coil of a lock magnet 77 over a conductor 78 and through the coil of the relay 57 to ground. A resistance 80 is connected between the conductors 78 and 56 for reasons hereinafter described. As the brush 63 is on the open segment 74 in the stop position of the distributor, the circuit through the magnet 77 and relay 57 is not completed and hence for this condition this relay and magnet remain unoperated. The armature 79 associated with the magnet 77 is fixed to a substantially horizontal lever 81 which is pivoted on a pin 82 at its right hand end and has a vertical wedge-shaped portion 83 at its left hand end. The lower edge of the wedge-shaped portion 83 is adapted to cooperate with upwardly extending vertical projections 84 adjacent the right hand ends of the permutation bars 39 to lock the same in operated positions as will be hereinafter described. A spring 86 attached to the lever 81 normally holds the lower edge of the wedge-shaped portion 83 above and out of operative relation with the projections 84 on the permutation bars.

The normal operation of the distributor 45 is as follows, assuming that one of the keylevers such as 37 is operated and subsequently released, the operation of which as described selectively positions the permutation bars 39 and contacts 42 and during the last part of the operation thereof actuates the universal bail 49 to close the contact 53. The closing of the contact 53 completes the circuit described to the start magnet 59 of the distributor 45 and releases the brushes 62 and 63 for rotation. As the brush 62 leaves the segment 73 of the ring 46, it contacts an open segment 87 and thus an open line condition is established over the conductor 68 which is the start impulse of the following code group of impulses to be transmitted. The contacts 42 supply potential to the segments numbered 1 to 5 of the ring 46 in a combination representative of the position of the permutation bars 41 and as the brush subsequently traverses these segments, a group of impulses composed of open and closed line conditions is transmitted over the conductor 68. As the brush 63 moving with the brush 62 leaves the open segment 74 of the ring 66, it connects potential from the solid ring 67 to the segment 65 and thence over conductor 76 through the coil of the magnet 77, conductor 78 and through the coil of relay 57 to ground. This causes the magnet 77 and relay 57 to operate and as the magnet 77 operates, the wedge-shaped portion 83 of the lever 81 is brought down to be positioned either to the right

or left of the projections 84 on the permutation bars 41 to prevent the position thereof from being changed until the wedge-shaped portion is elevated to its normal position near the completion of one revolution of the brush 63 when it contacts the open segment 74 to open the circuit through the magnet 77 and relay 57. The operation of the relay 57 opens the circuit from the contact 53 to the start magnet 59 and as this occurs relatively early in the revolution of the brush 63, the armature 61 of the magnet 59 will have sufficient time to return to its unoperated position and stop the brushes 62 and 63 after they have made one revolution. Thus the operations of the magnet 77 prevents the operation of another keylever such as 37 during the transmission of a code combination representative of the previously actuated keylever and the operation of the relay 57 insures that the circuit to the start magnet 59 is normally opened relatively early in the cycle of operation of the distributor 45 and normally prevents more than one revolution of the brushes 62 and 63, should one of the keylevers such as 37 not be released until near the end of a revolution of the brushes. Should one of the keylevers such as 37 be held depressed for a prolonged interval the resistance 80 around the coil of the relay 57 permits sufficient current to flow therethrough to keep the relay operated and thus maintain the circuit to the start magnet 59 open.

In accordance with the invention a special keylever 88 is employed which is hereinafter referred to as the tabulating keylever. The tabulating keylever 88 is pivoted on the rod 47 and is positioned to the left of the permutation bars 39 so that on the actuation thereof, it does not cooperate directly with any of the beveled surfaces 41 on the permutation bars 39. The tabulating keylever 88 has therein and extending at right angles thereto a rod 89, the right hand end of which extends above the word space keylever 38. The left hand end of the rod 89 carries an insulating member 91 which cooperates with the tongue of a normally open contact 92. Thus when the tabulating keylever 88 is operated, the rod therein causes the word space keylever 38 to operate and position the permutation bars 39 in a combination representative thereof and also close the contact 92. The manner in which such an operation of the tabulating keylever 88 permits successive word space signals to be automatically transmitted will be hereinafter pointed out.

One of the terminals of the contact 92 is connected by a conductor 93 to one of the terminals of the normally closed contact 36 hereinbefore described on the associated printer. The other terminal of the contact 36 is connected by a conductor 94 to the conductor 58 while the other terminal of the contact 92 is connected by a conductor 96 to the conductor 56. Although the printer such as that employing the printing unit 19 is usually directly associated with the controlling keyboard, and a common motor employed to furnish power for operating the printer and rotating the start-stop distributor 45, the two units may be separated and operate as independent units, as the only connection necessary between the keyboard and the printer is that established by the two conductors 94 and 96 and a circuit to the selector magnet such as 69.

Assume that a few characters have been printed at the beginning of a line and it is desired for the next character printed to appear at the

beginning of a column at a predetermined point in the travel of the typewheel car 19. Accordingly, the first removable stop 29 will be placed opposite the point where the first printed character of a column is to appear. To automatically space the typewheel car 19 from the last printed character to a point at the beginning of the first column, the tabulating keylever 88 is depressed and held depressed until the typewheel car reaches this position whereupon further movement of the typewheel car automatically ceases. The depressing of the tabulating keylever 88 through the word space keylever 38 operating therewith positions the permutation bars 39 so that a word space signal is transmitted as hereinbefore described and also closes the contact 92 which will apply battery through the contact 53, the contact 53 being closed at the time by the universal bail 49 operated by the keylever 38, over conductors 54 and 96, through the contact 92, over conductor 93, through the contact 36 and over conductors 94 and 58, through the coil of the start magnet 59 to ground. This circuit energizes the magnet 59 and maintains the armature 61 thereof in an operated position as long as the keylever 88 is held operated or until the depending projection 32 on the typewheel car 19 engages the arm 31 on the first stop 29 to pivot the bar 27 to open the contact 36 and break the circuit therethrough as hereinbefore described. This breaking of the circuit to the magnet 59 allows the same to become deenergized and the armature 61 thereof to be positioned to stop the brushes 62 and 63 in their normal position after their current revolution. Thus the typewheel car 19 is advanced from the last printed character on the page to some predetermined point in its travel determined by the position of the next stop 29 on the bar 27. Several stops such as 29 may be placed on the bar 27 and each determines the beginning of a column in the manner above described.

After the typewheel car 19 is automatically stopped in a predetermined stop position at the beginning of a column by the projection 32 engaging the arm 31 of the associated stop 29, to open the control circuit as hereinbefore described, the next movement of the typewheel car in a letter or word spacing direction in conjunction with the printing or word spacing operation disengages the projection 32 with the arm 31 on the stop and allows the bar 27 to pivot back into its normal position. Thus when it is desired to omit the printing in a particular column after the typewheel car 19 has been stepped opposite the beginning of that column, the tabulating key 88 is again depressed and word space signals will be automatically transmitted as long as the keylever is held depressed or until the projection 32 engages the arm 31 on the next stop 29.

It will be obvious that where the printers of an entire system, such as those on a news system, are to be controlled in accordance with the above to facilitate the printing in column, only one of the printers, such as a pilot printer associated with the keyboard, need be equipped with the pivotable bar 27 and the stops 29 as the word space signals automatically transmitted from the keyboard will advance the printing units relative to the platens of all the printers on the system.

When a full line of printer matter is being recorded, or at times when it is not desired to print in columns, the engagement of projection 32 with the arms 31 of the stop 29 does not complete the above described circuit to the distribu-

tion start magnet 59 as the circuit thereto will be open at the normally open contact 92. Thus the stops 29 have no effect on the movement of the typewheel car 19 during the printing of full lines.

If for some reason it is desired to transmit a number of word space signals and not have them cease when the printing unit is opposite predetermined points on the recording paper all that is necessary is to shunt out the contact 36. Thereupon the keyboard will transmit word space signals as long as the tabulating keylever 88 is held operated. Although the described use of the tabulating keylever 88 is to cause the transmission of word space signals it could easily be adapted to cause the transmission of a succession of any of the other signals, such as those representing periods, by an obvious arrangement. By omitting the tabulating keylever 88 and its associated circuits the keyboard would operate to transmit a code signal representative of an actuated one of the keylever as in the standard keyboards.

It will also be obvious, of course, that various other modifications of the invention may be made without departing from the spirit or essential attributes thereof and it is desired, therefore, that only such limitations be placed thereon as are imposed by the prior art or are specifically set forth in the appended claims.

What is claimed is:

1. In a transmitter, a set of keylevers, a distributing mechanism normally released for one revolution at a time in conjunction with each actuation of a keylever to transmit representative code groups of impulses, means responsive to the actuation of a first predetermined keylever to release said distributor for one revolution to transmit a predetermined code group of impulses and means responsive to the actuation of a second predetermined keylever to simultaneously actuate said first predetermined keylever and effect the release of said distributor for a plurality of revolutions to transmit a plurality of said predetermined code groups or impulses.

2. In a transmitter, a set of keylevers, a distributing mechanism normally released for one revolution at a time in conjunction with each actuation of a keylever to transmit representative code groups of impulses, means responsive to the actuation of a first predetermined keylever irrespective of the length of time it is operated to release said distributor for one revolution to transmit a predetermined code group of impulses, means responsive to the actuation of a second predetermined keylever to simultaneously actuate said first predetermined keylever, means operative on the actuation of said second predetermined keylever to release said distributor to successively transmit a plurality of code groups of impulses representative of said first predetermined keylever and means operative on the release of said second predetermined keylever for releasing said first predetermined keylever and stopping rotation of said distributor.

3. In a telegraph transmitting keyboard, a set of keylevers, a distributor mechanism normally at rest, means controlled by all but predetermined of said keylevers for releasing said distributor for one cycle of operation to transmit a representative code group of impulses, means normally operative for stopping said distributor after each cycle of operation thereof, said distributor mechanism transmitting a code group of impulses representative of an actuated keylever

during each cycle, means operative on the actuation of predetermined of said keylevers to release said distributor mechanism and disable said stopping means whereby said distributor mechanism operates through a plurality of successive cycles of operation and means operative on the release of the predetermined of said keylevers to render said distributor stopping means effective to stop the same after the current cycle of operation thereof.

4. In a telegraph transmitting keyboard, a set of keylevers, a distributor mechanism normally at rest, means controlled by all but predetermined of said keylevers for releasing said distributor for one cycle of operation to transmit a representative code group of impulses, means normally operative for stopping said distributor after each cycle of operation thereof, said distributor mechanism transmitting a code group of impulses representative of an actuated keylever during each cycle, means operative on the actuation of predetermined of said keylevers to release said distributor mechanism and disable said stopping means whereby said distributor mechanism operates through a plurality of successive cycles of operation thereof, means operative on the release of the predetermined of said keylevers to render said distributor stopping means effective to stop the same after the current cycle of operation thereof and means operative during successive cycles of operation of said distributor mechanism initiated on the actuation of the predetermined of said keylevers for transmitting similar groups of impulses representative of a keylever effective to release said distributor mechanism for one cycle of operation on each actuation thereof.

5. In combination, a set of keylevers, a rotary distributor for distributing code groups of impulses representative of actuated ones of said keylevers, a normally unoperated electro-responsive means for controlling the release of said distributor, means operative on the actuation of one said keylevers at a time for completing an operating circuit to said electro-responsive means to operate the same to release said distributor for rotation, means operative during the operation of said distributor for opening the circuit to said electro-responsive means to invariably stop said distributor after one revolution thereof and means for maintaining said circuit in an open condition until the actuated one of said keylevers is released.

6. In combination, a set of keylevers, a rotary distributor for distributing code groups of impulses representative of actuated ones of said keylevers, a first electro-responsive means for controlling the operation of said distributor, means operative on the actuation of said keylevers one at a time for completing an operating circuit to said electro-responsive means to operate the same to release said distributor for a cycle of operation, a second and third electro-responsive means operated by said distributor during rotation thereof for preventing the actuation of a second keylever and opening the circuit to said first electro-responsive means respectively, means operative on the release of a keylever during rotation of said distributor for returning said second and third electro-responsive means to normal at the completion of a cycle of operation of said distributor, and means operative on the continued actuation of a keylever after a cycle of operation of said distributor for maintaining said second and third electro-responsive means in an operated condition.

7. In combination, a transmitting keyboard

mechanism adapted to transmit representative code groups of signals on the actuation of keylevers, a receiving printing mechanism responsive to received code groups of signals having a printing unit movable relative to a recording paper to record in transverse lines on said paper, said printing unit normally being advanced a predetermined distance in a letter spacing direction on the receipt of each code group in signals, means for transmitting a plurality of successive printer unit advancing signals on a single actuation of a predetermined one of said keylevers and means controlled by the movement of said printing unit for stopping the transmission of said printer unit advancing signals.

8. In combination, a transmitting keyboard mechanism adapted to transmit representative code groups of signals on the actuation of keylevers, a receiving printing mechanism responsive to received code groups of signals having a printing unit movable relative to a recording paper to record in transverse lines on said paper, said printing unit normally being advanced relative to said paper a predetermined distance in a letter spacing direction on the receipt of each recording or word spacing code group of signals, means in said keyboard mechanism for transmitting a plurality of successive word spacing signals on the actuation and continued actuation of a predetermined one of said keylevers and means controlled by the position of said printing unit relative to said paper at the time of actuating said predetermined keylever for determining the number of word spacing signals transmitted.

9. In combination, a transmitting keyboard mechanism adapted to transmit representative code groups of signals on the actuation of keylevers, a receiving printing mechanism responsive to received code groups of signals having a printing unit movable relative to a recording paper to record in transverse lines on said paper, said printing unit normally being advanced relative to said paper a predetermined distance in a letter spacing direction on the receipt of each recording or word spacing code group of signals, means in said keyboard mechanism for transmitting a plurality of successive word spacing signals on the actuation and continued actuation of a predetermined one of said keylevers, means controlled by the position of said printing unit relative to said paper at the time of actuating said predetermined keylever for determining the number of word spacing signals transmitted independent of the continued actuation of said predetermined keylever and means for stopping the transmission of said word spacing signals after said determined number have been transmitted.

10. In a telegraph apparatus, a set of keylevers, a cyclically operable distributor, a magnet for releasing said distributor, means for completing a circuit to said magnet to energize the same to effect release of said distributor on the operation of any one of said keylevers, means for opening said circuit during the operation of said distributor and means for maintaining said circuit in an open condition after the completion of a cycle of operation of said distributor on the continued operation of the keylever that completed said circuit.

11. In a telegraph apparatus a set of keylevers, a set of permutation members selectively positioned into one or the other of two positions by said keylevers, a plurality of sets of trans-

mitting contacts, one set for each of said permutation members and adapted to be positioned in open and closed condition in accordance with the operation of said permutation members, a cyclically operable distributor for transmitting a signal group representative of the setting of said contacts on each operation thereof, a start magnet for releasing said distributor, means for completing a circuit to said start magnet to release said distributor on the actuation of any one of said keylevers, a permutation member locking magnet, a relay, means operative during the operation of said distributor for operating said locking magnet and said relay to lock said permutation members in position and open the circuit to said distributor start magnet respectively, and means for maintaining said relay operated after a cycle of operation of said distributor on the continued actuation of a keylever, the operation of which previously completed the circuit to said distributor start magnet.

12. In a telegraph apparatus a set of keylevers, a set of permutation members selectively positioned into one or the other of two positions by said keylevers, a plurality of sets of transmitting contacts, one set for each of said permutation members and adapted to be positioned in open and closed condition in accordance with the operation of said permutation members, a cyclically operable distributor for transmitting a signal group representative of the setting of said contacts on each operation thereof, a start magnet for releasing said distributor, means for completing a circuit to said start magnet to release said distributor on the actuation of any one of said keylevers, a permutation member locking magnet, a relay, means operative during the operation of said distributor for operating said locking magnet and said relay to lock said permutation members in the position moved to by one of said keylevers and open a circuit to said distributor start magnet respectively, means for maintaining said relay operated after a cycle of operation of said distributor on the continued actuation of any one of said keylevers, the operation of which previously completed the circuit to said distributor start magnet and means operative on the actuation of a predetermined keylever for rendering said relay ineffective to open the circuit to said distributor start magnet whereby said distributor operates through a plurality of successive cycles of operation.

13. In a telegraph apparatus a set of keylevers a set of permutation members selectively positioned into one or the other of two positions by said keylevers, a plurality of sets of transmitting contacts, one set for each of said permutation members and adapted to be positioned in open and closed condition in accordance with the operation of said permutation members, a cyclically operable distributor for transmitting a signal group representative of the setting of said contacts on each operation thereof, a start magnet for releasing said distributor, means for completing a circuit to said start magnet to release said distributor on the actuation of any one of said keylevers, a permutation member locking magnet, a relay, means operative during the operation of said distributor when released by all but a predetermined one of said keylevers for operating said locking magnet and said relay to lock said permutation members in the position moved to by one of said keylevers and open a circuit to said distributor

start magnet respectively and means operative on the actuation of said predetermined keylever for rendering said relay ineffective to open the circuit to said distributor start magnet whereby said distributor operates through a plurality of successive cycles of operation.

14. In combination, a recording paper, a printing unit adapted to record in transverse lines on said paper, a keyboard transmitting mechanism comprising keylevers and a cyclically operable distributor for controlling the selective operation of said printing unit and relative movement thereof with said paper, a releasing means for said distributor, said means normally being adapted to release said distributor for one cycle of operation on each actuation of a keylever, means operative on a single actuation of a predetermined one of said keylevers for releasing said distributor for a plurality of cycles of operation to transmit a plurality of predetermined code signals to said printer unit which cause relative movement thereof with said paper and means operative at predetermined points in the relative movement of said printing unit and said paper for automatically rendering said start magnet effective to stop said distributor.

15. In combination, a printing mechanism comprising a recording paper and a printing unit adapted to record in transverse lines thereon, a transmitting keyboard comprising a set of keylevers and a cyclically operable distributor, a magnet for releasing said distributor, means for completing a circuit to said magnet to operate the same to release said distributor on the actuation of any one of said keylevers, a relay, means controlled by said distributor during operation thereof when released by all but a predetermined one of said keylevers for controlling said relay to open the circuit to said magnet to stop said distributor after one cycle of operation, means operative on the actuation of said predetermined keylever for rendering said relay ineffective to open said circuit whereby said distributor successively operates through a plurality of predetermined cycles, each of said predetermined cycles including movement of said printing unit relative to said paper a predetermined amount in the same direction and means operative when said printing unit is moved opposite the first one of a series of predetermined points on said paper by the transmission of signals on the successive operations of said distributor for opening a circuit to said magnet.

16. In a telegraph system, a plurality of printing telegraph receivers having printing units movable relative to associated recording papers to record in transverse lines thereon, a keyboard mechanism having keylevers each actuation of all but a predetermined one of which transmit a code group of signals to said receivers to selectively control the same, means operative on a single actuation of the predetermined one of said keylevers for transmitting a plurality of predetermined code groups to said receivers, said signals being effective on said receivers to advance said printing units relative to associated papers in a letter spacing direction a predetermined distance for each code group and means associated with a predetermined one of said receivers for stopping the transmission of said predetermined code groups with all of the printing units opposite predetermined points on associated recording papers.

17. In combination, a printing mechanism for recording in a plurality of longitudinal columns

on a recording paper by a printing unit movable transversely of said paper, a keyboard mechanism having a plurality of keylevers, each actuation of all but a predetermined one of which cause a signal code group of signals to be transmitted to said printing mechanism, means operative on a single actuation of said predetermined keylever for initiating the transmission of a succession of a plurality of code groups of signals, said code groups being such as to include the movement of said printing unit a predetermined amount relative to said paper and means dependent on the distance of said printing unit to the beginning of the next column on said paper at the time of actuating said predetermined code lever for determining the number of code groups transmitted in succession.

18. In combination, a printing mechanism for recording in a plurality of longitudinal columns on a recording paper by a printing unit movable transversely of said paper, a keyboard mechanism having a plurality of keylevers, each actuation of all but a predetermined one of which cause a signal code group of signals to be transmitted to said printing mechanism, means operative on a single actuation of said predetermined keylever for initiating the transmission of a succession of a plurality of code groups of signals, said code groups being such as to include the movement of said printing unit a predetermined amount relative to said paper, means dependent on the distance of said printing unit to the beginning of the next column on said paper at the time of actuating said predetermined code lever for determining the number of code groups transmitted in succession and means operative on a second actuation of said predetermined keylever after said printing unit is stopped at the beginning of one column on said paper to advance said printing unit to the beginning of the next column.

19. In combination, a transmitting keyboard mechanism adapted to transmit representative code groups of signals on the actuation of key levers, a receiving printing mechanism responsive to received code groups of signals, means in said keyboard mechanism for initiating the transmission of a plurality of successive signals on the actuation and continued actuation of a predetermined one of said key levers and means controlled by said receiving printing mechanism for stopping transmission of said plurality of successive signals.

20. In a telegraph system, a keyboard transmitting mechanism employing a plurality of key levers normally operative to transmit a single code group of impulses on the actuation of a key lever, a printing mechanism selectively controlled by said keyboard mechanism, means in said keyboard operative on the actuation and continued actuation of a predetermined one of said key levers for initiating the transmission of a succession of code groups and means associated with said printing mechanism for interrupting the transmission of said succession of code groups of impulses irrespective of the continued actuation of said predetermined one of said key levers.

21. In a telegraph system, a keyboard controlled signal transmitter normally operative to transmit a single code group of impulses on each actuation of a key lever, a recording mechanism selectively responsive to code groups of impulses transmitted from said transmitter, key lever con-

trolled means for initiating the transmission of a succession of code groups and means including said receiving mechanism for terminating the transmission of said succession of code groups.

22. In combination, a keyboard transmitting mechanism normally operative to transmit a single code group of impulses on each actuation of a key lever, a receiving mechanism selectively controlled by said transmitting mechanism having a printing unit and a recording paper movable relative to one another, key lever controlled means at said transmitting mechanism to initiate the transmission of a plurality of successive groups of impulses and adjustable means at said receiving mechanism for interrupting the transmission of said plurality of successive code groups at various points in the relative movement of said printing unit and said recording paper.

23. In combination, a keyboard transmitting mechanism normally operative to transmit a single code group of impulses on each actuation of a key lever, a receiving mechanism selectively controlled by said transmitting mechanism having a printing unit and a recording paper movable relative to one another, key lever controlled means at said transmitting mechanism to initiate the transmission of a plurality of successive code groups of impulses, and automatic means controlled by the relative movement of said printing unit and said recording web for interrupting transmission of said plurality of successive code groups at predetermined positions in the relative movement of said printing unit and said recording paper.

24. In combination, a keyboard transmitting mechanism normally operative to transmit a single code group of impulses on each actuation of a key lever, a receiving mechanism selectively controlled by said transmitting mechanism having a printing unit and a recording paper movable relative to one another, means operative on the actuation and continued actuation of a predetermined key lever for transmitting a plurality of successive code groups of impulses and means cooperating with said printing unit for automatically interrupting the transmission of only said successive code groups of impulses at adjustable points in the relative movement of said printing unit and said recording paper irrespective of the continued actuation of said predetermined key lever.

25. In a telegraph system, a keyboard transmitter operative to transmit code groups of impulses representative of actuated key levers, said transmitter normally transmitting only a single code group on the momentary or continued actuation of said key levers, a receiving printer, a line circuit normally in a closed line condition connecting said printer and transmitter whereby said printer is selectively controlled by signals from said transmitter, means operative on the actuation and continued actuation of predetermined of said key lever to control said transmitter to transmit a succession of predetermined code groups of impulses and means at said printer for stopping transmission of said succession of predetermined code groups and returning said line circuit to said normal closed condition regardless of the continued actuation of said predetermined of said key levers.

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DISCLAIMER

2,250,717.—*James W. Long*, Plainfield, and *George I. Roberts*, Cresskill, N. J. TELEGRAPH APPARATUS. Patent dated July 29, 1941. Disclaimer filed February 16, 1944, by the assignee, *The Western Union Telegraph Company*.

Hereby enters this disclaimer to claims 21, 22, and 23 of said patent.

[*Official Gazette March 21, 1944*]