

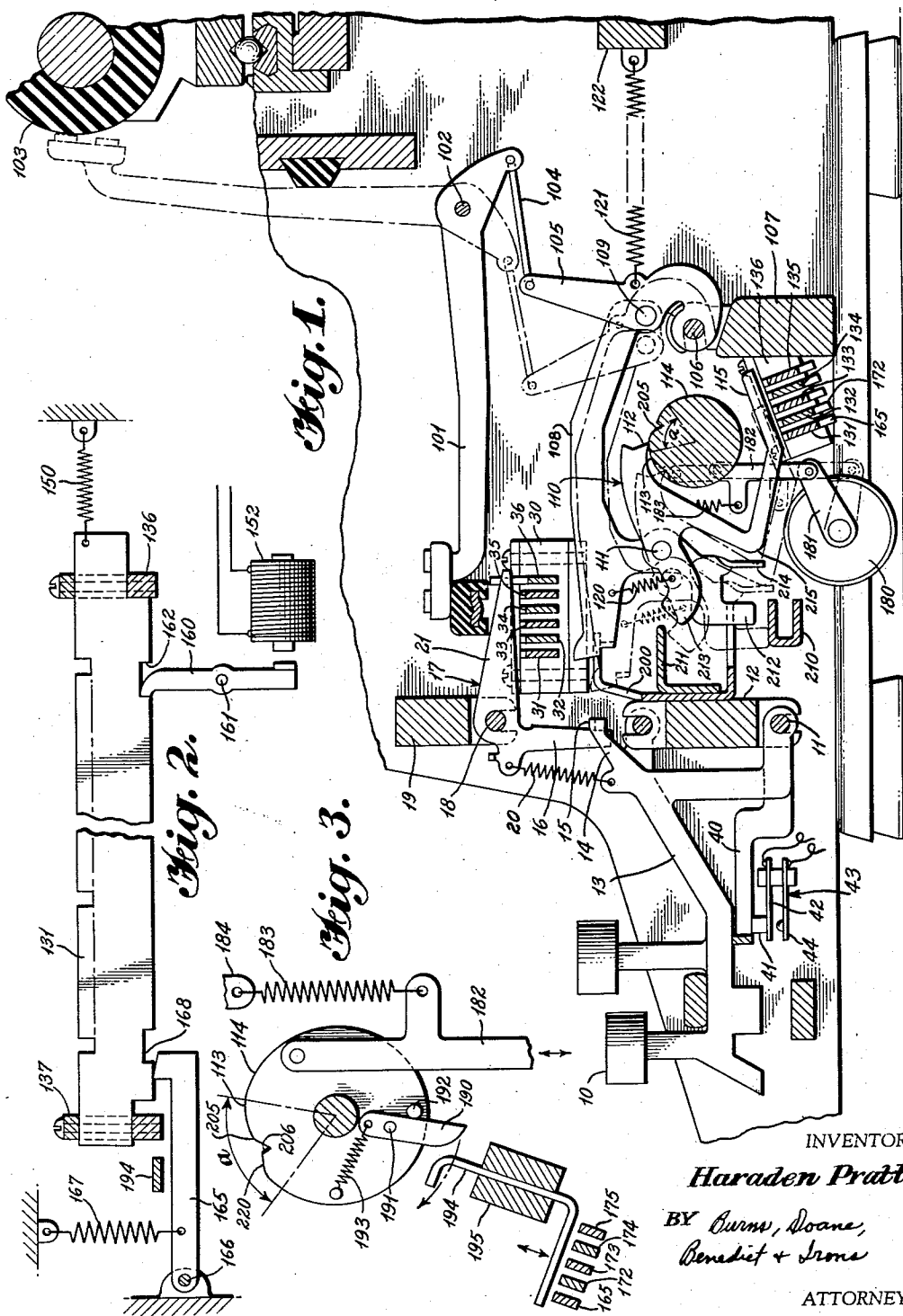
Nov. 4, 1958

H. PRATT
TELETYPEWRITER

2,859,277

Filed June 29, 1955

3 Sheets-Sheet 1



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TELETYPEWRITER

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Fig. 4.

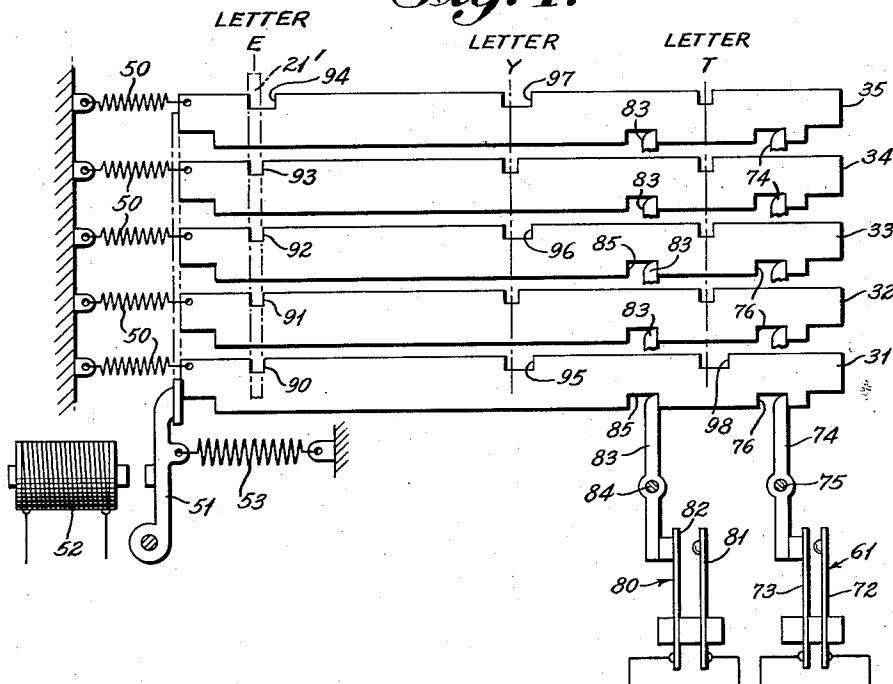
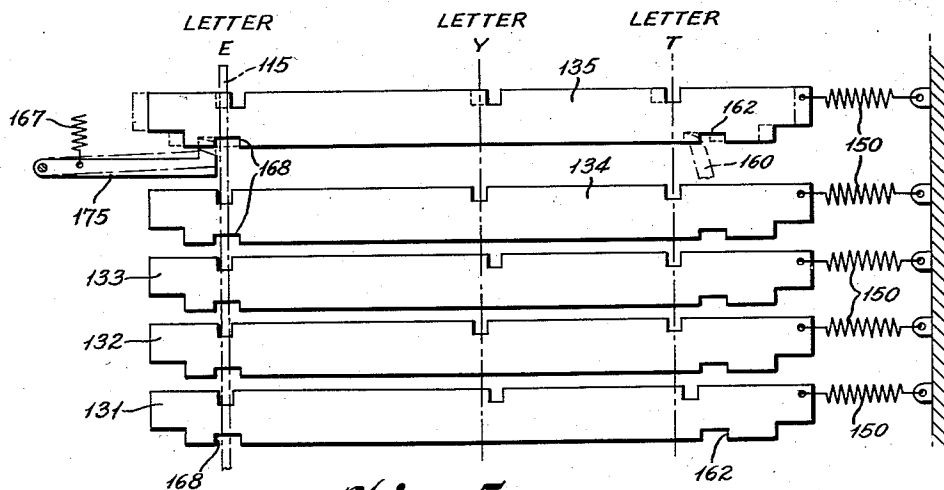


Fig. 5.



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ATTORNEYS

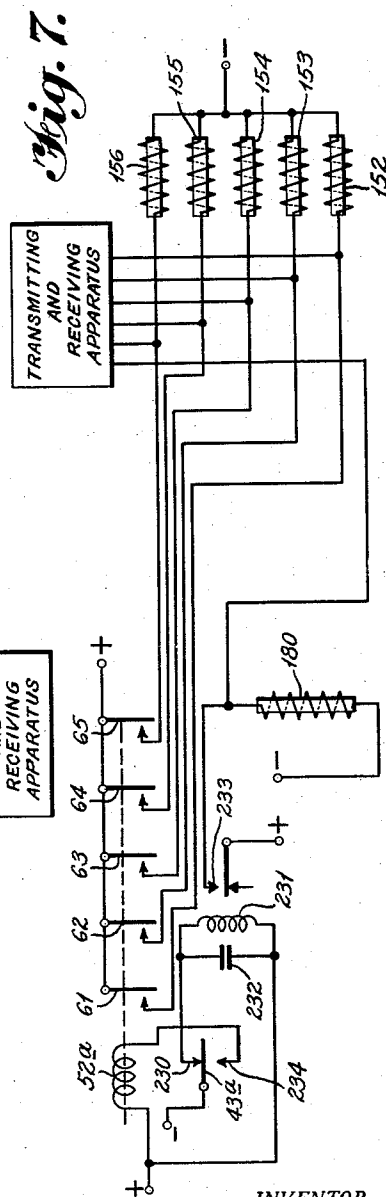
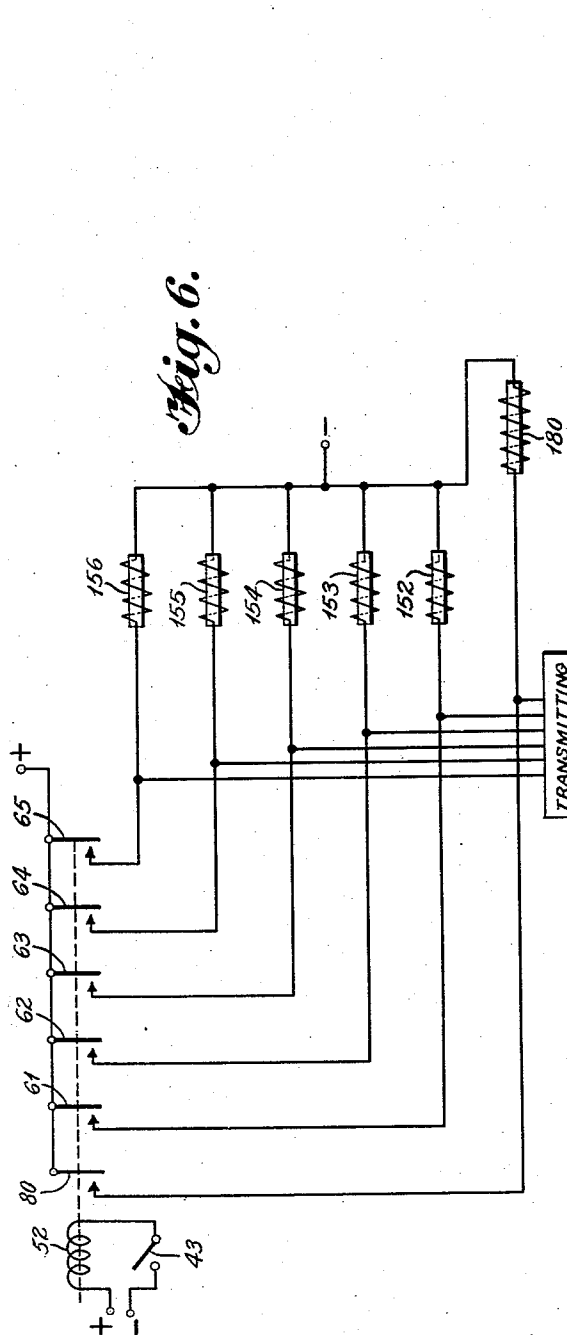
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3 Sheets-Sheet 3



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2,859,277

TELETYPEWRITER

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Application June 29, 1955, Serial No. 518,774

11 Claims. (Cl. 178—25)

The present invention relates to apparatus for information transmission and reception and relates particularly to a teleprinter or teletypewriter capable of transmitting intelligence while retaining a typewritten copy at the point of transmission and also capable of receiving and typing messages.

The teletypewriter of the invention may be briefly described as comprising a keyboard actuated code signal selecting or forming assembly, a printing assembly and electrical means for transmitting the code signals from the selecting assembly to the printing assembly. The transmitting means may transmit the selected code signals to a remote printing assembly as well as to the printing assembly associated with the keyboard being operated. The signal selecting assembly includes a plurality of notched permutation bars, power means for shifting such bars and a lever actuated by depression of a key of the keyboard for engaging the notches in certain of the permutation bars to prevent shifting thereof. The particular key of the keyboard which is depressed determines the permutation bar or group of permutation bars which are shifted. The shifting of any permutation bar or group of permutation bars actuates appropriate switches to select a code signal which is transmitted to the printing assembly. The printing assembly includes a plurality of notched selector slides and selector slide positioning means which is responsive to the code signal received from the signal selecting assembly and which acts to align certain notches in the selector slides. When notches in the selector slides are aligned a pawl attached to a type actuating bar corresponding to the received code signal is permitted to engage and be actuated by a power operated oscillatory drive roller to cause the printing of the appropriate character.

Among the objects of the invention are to provide a teletypewriter of small size and of simple and inexpensive construction which is capable of high speed of operation, to provide a teletypewriter which utilizes in large measure the conventional parts of a well-known commercially available electric typewriter, to provide a teletypewriter the mechanical parts of which require no power except when actually receiving or transmitting and printing, to provide a novel means for signal selection which retains the nicety of touch and limited key movement of the conventional electric typewriter, and to provide a teletypewriter which maintains, so far as mechanically possible, manufacturing tolerances which do not exceed those normally used in standard typewriter design and manufacture.

Other objects and advantages of the invention will be described in the following detailed description which has reference to the accompanying drawings wherein:

Figure 1 is a cross-sectional view of the portions of a teletypewriter embodying the present invention;

Figure 2 is a view partly in side elevation and partly in cross-section of one of the selector slides with its associated positioning and retaining mechanisms;

Figure 3 is a view partly in end elevation and partly in

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cross-section of the drive roller with its associated linkage and also illustrating the camming mechanism for releasing the retaining latches from the selector slides;

Figure 4 is a diagrammatic view illustrating the configuration and operating mechanism for the signal permutation bars;

Figure 5 is a diagrammatic view illustrating the configuration and latching mechanism for the selector slides;

Figure 6 is a simplified diagrammatic view showing only the principal elements of the electrical system; and

Figure 7 is a view similar to Figure 6 but illustrating a modified form of the electrical system.

The invention as illustrated and described utilizes many of the conventional parts of a well-known commercially available electric typewriter and any parts not specifically illustrated or described in this application may be considered as conventional in such typewriter. For an understanding of the essential features of such electric typewriter reference may be had to United States Patent No. 2,563,722 which issued August 7, 1951, to Henry J. Hart.

The teletypewriter of the present invention involves no mechanical connection between the keys of the keyboard and the type bars. The keyboard is utilized in a novel manner to select code signals and the keyboard performs no other function. The code signals selected by the keyboard are transmitted to the printing portion of the teletypewriter. The code signals selected by the keyboard may, of course, also be transmitted to a remotely located teletypewriter, thus obtaining a typewritten copy of the message at both the transmitting point and the remote or receiving point. The printing portion of the teletypewriter is also responsive to code signals received from a remotely located point or from other apparatus such as a tape reader.

Description of the keyboard and the code signal selector mechanism

The keyboard preferably includes a conventional number of keys. It will be sufficient to describe the construction and operation of only one such key and its associated mechanism, it being understood that the other keys and their associated mechanisms operate in a similar manner. The key 10 is pivotally mounted at 11 to a cross bar 12 forming a portion of the frame of the machine. The key bar 13 of the key 10 is provided with a rearwardly extending arm 14 which carries a lug 15 on its rearward end. The lug 15 is positioned to engage a vertical arm 16 of a bell crank lever 17 which is pivotally mounted at 18 in a cross bar 19 forming a part of the frame of the machine. A tension spring member 20 connects the key bar 13 and the bell crank lever 17 in the manner shown in the drawing and serves to normally retain the key bar 13 and the bell crank lever 17 in the positions shown in Figure 1.

Fixed to the frame of the machine are permutation bar supports 30 which slideably support in side by side horizontal positions a plurality of notched signal permutation bars 31, 32, 33, 34 and 35. The supports 30 also rigidly support a comb guide 36 which provides vertical guideways for the horizontal arms 21 of the bell crank levers 17.

A generally U-shaped member 40 has its open ends pivotally mounted to the frame of the machine at 11 and has its closed end extending under the key bars 13 of all keys 10 of the machine. The U-shaped member 40 carries a switch actuating member 41 which engages and depresses spring contact member 42 of a single switch designated generally by the reference numeral 43. It will be understood that engagement of the spring contact member 42 with the rigid contact member 44 will close the switch 43 upon depression of any key.

The arrangement of the signal permutation bars 31, 32, 33, 34 and 35 can be better understood by reference to Figure 4 where those bars are shown in vertically disposed or exploded relationship rather than in their actual side by side relationship as illustrated in Figure 1. Each of the signal permutation bars 31 to 35 is provided with an individual first spring member 50, which biases or tends to urge its associated permutation bar to the left as seen in Figure 4. The end of each of the signal permutation bars is engaged by the armature 51 of an electromagnet 52 which is energized by closing of the switch 43. When the electromagnet 52 is de-energized armature 51 is held in the position shown in Figure 4 by means of a spring member 53 which is of sufficient strength to overpower all of the spring members 50 and to retain the permutation bars in the positions shown in Figure 4.

Each of the permutation bars 31 to 35 is provided with an individual switch 61, 62, 63, 64 and 65. Only the switch 61 is illustrated in Figure 4, the remaining switches being shown in Figure 6. The switches 61 to 65 are identical and include a stationary contact arm 72 and a movable contact arm 73. The movable contact arm of switch 61 is movable by means of a lever 74 which is pivotally mounted at 75 and which engages a notch 76 in the permutation bar 31. The switches 62, 63, 64 and 65 are similarly equipped and arranged with respect to the permutation bars 32, 33, 34 and 35 respectively.

Operatively associated with all of the permutation bars 31 to 35 is a single switch 80 having a stationary contact arm 81 and a movable contact arm 82. The movable contact arm 82 is moved to close the switch 80 by means of a lever 83 which is pivoted at 84 and which engages notches 85 in all of the permutation bars 31 to 35. This arrangement causes the switch 80 to be closed upon movement of any of the permutation bars to the left from the positions shown in Figure 4. The switch 80 is preferably closed a short time interval after the closing of any of the switches 61 to 65.

Operation of keyboard and code signal selector mechanism

Let it be assumed that the key 10 corresponding to the letter "E" is depressed. The lug 15 engages the vertical arm 16 of the bell crank lever 17 and causes the horizontal arm 21 of the lever 17 to enter the notches 90, 91, 92, 93 and 94 of the permutation bars 31 to 35, respectively. The position of the arm 21 is diagrammatically illustrated by dotted lines in Figure 4 and is designated by the reference numeral 21'. After the arm 21 has entered the notches 90 to 94 but before the key 10 has completed its downward travel, the switch 43 closes to energize electromagnet 52. Energization of the electromagnet 52 pulls its armature 51 out of engagement with the ends of the permutation bars and thereby stretches the spring 53 and renders that spring ineffective. The springs 50 are then free to attempt to move all permutation bars to the left as seen in Figure 4. Only the permutation bar 35 will be moved to the left for the reason that the notch 94 therein has a leftwardly facing shoulder which is spaced to the right from the arm 21'. The remaining permutation bars 31, 32, 33 and 34 are held against leftward movement because of the fact that the leftwardly facing shoulders of their notches 90, 91, 92 and 93 are already in substantial engagement with the arm 21'. Leftward movement of the permutation bar 35 will close the switch 65 (see Figure 6) associated therewith and will provide the associated electrical system with a code pulse corresponding to the letter "E." The closing of the switch 65 is accomplished by the initial leftward movement of the permutation bar 35. A short time after closing of the switch 65, the continued leftward movement of the permutation bar 35 will effect closing of the switch 80 which provides the associated electrical

system with the printing pulse, sometimes called the sixth pulse.

It will be understood that the permutation bars 31 to 35 are notched for all characters and operating functions of the machine. Only the notches for the letters "E," "Y" and "T" are shown in Figure 4. It can be seen from inspection of Figure 4 that if the key 10 corresponding to the letter "Y" is depressed the permutation bars 31, 33 and 35 will move to the left because of the fact that their leftwardly facing shoulders 95, 96 and 97 are rightwardly spaced from the horizontal arm 21 corresponding to the letter "Y." This results in closing the switches 61, 63 and 65, providing the associated electrical apparatus with the code pulses corresponding to the letter "Y." Switch 80 will also be closed to provide the printing or sixth pulse. If the key 10 corresponding to the letter "T" is depressed, only the permutation bar 31, having the rightwardly spaced shoulder 98, will move to the left, closing the switch 61 and providing the associated electrical apparatus with a code pulse corresponding to the letter "T." The switch 80 will also be closed providing the printing pulse.

When any depressed key 10 is released by removal of the operator's finger, the switch 43 first opens to de-energize the electromagnet 52. Spring 53 then overpowers the combined force of the springs 50 and returns the permutation bars to their neutral positions as shown in Figure 4. The spring 20 returns the key 10 to its upward position and also rotates the bell crank lever 17 in a counter-clockwise direction to withdraw the arm 21 from the notches in the permutation bars. If the arm 21 should be momentarily bound by engagement with the shoulders of the notches in the permutation bars, the key 10 will nevertheless rise freely because of the fact that the lug 15 can withdraw from the vertical arm 16 of the bell crank lever 17. However, this binding of the arm 21 will be only momentary because of the fact that the spring 53 will almost immediately restore the permutation bars to their neutral positions in which there is no binding engagement with the arm 21.

It has been pointed out that the appropriate switches 61 to 65 are closed before the closing of the switch 80 so that the selection of the code pulses corresponding to the desired letter will precede the printing or sixth pulse. This arrangement is desirable but is not ordinarily critical for the reason that the inertia of the printing mechanism hereinafter described exceeds that of the selector slides hereinafter described and there will, therefore, inherently be a time-lag between the actuation of the selector slides and the printing operation. It is also possible to build a time-lag into the electrical system as hereinafter described.

It will be seen that in depressing a key 10 the only energy required of the operator is that sufficient to rotate the bell crank lever 17 against the action of the spring 20 and to close the switch 43. The bell crank lever 17 is essentially identical for all keys and the identical switch 43 is, of course, closed by depressing any key. The uniformity, lightness and nicety of touch of the keyboard is thus assured. The work of closing the switches 61 to 65 and 80 is transferred to the electromagnet 52. This is an important feature of the invention because it assures uniformity of touch of all keys irrespective of the number of switches which must be closed to provide a code signal corresponding to the depressed key. For example, a code signal corresponding to the letter "E" requires closing only the switches 61 and 80 while depression of the key corresponding to the letter "Y" requires the closing of switches 61, 63, 65 and 80. The uniformity of touch of the keys corresponding to the letters "E" and "Y" would obviously be difficult to attain if the appropriate switches were to be closed manually rather than through the intervention of the electromagnet 52.

Description of the printing mechanism and the selector slides

The printing mechanism includes a plurality of type bars of which only one is shown in the drawing and designated by the reference numeral 101. The type bar 101 is pivotally mounted at 102 and is adapted to be moved from the full line position shown in Figure 1 to the dotted line position to engage a platen 103 in a manner well understood in the typewriter art. The type bar 101 is connected by a link 104 to a type bar actuating lever 105 which is pivotally mounted at 106 to a cross bar 107 which forms a portion of the frame of the machine. An actuator bar 108 is pivotally connected to the lever 105 at 109. A pawl designated generally by the reference numeral 110 is pivotally connected to the actuator bar 108 at 111. The pawl 110 has a nose portion 112 which is arranged to normally rest on an arcuate portion 113 of an oscillatory drive roller 114. The pawl 110 also has a tail portion 115 which is positioned below the drive roller 114 in close juxtaposition to the selector slides hereinafter described. The pawl 110 thus straddles the drive roller 114. A spring member 120 urges the nose portion 112 of the pawl into engagement with the drive roller 114.

The type bar 101, actuating type bar lever 105, actuator bar 108 and pawl 110 are movable from the full line positions shown in Figure 1 to the dotted line positions shown in that figure by mechanism hereinafter described. The foregoing elements are biased to their full line positions by means of a spring member 121 secured to the type bar operating lever 105 and to a cross bar 122 which forms a portion of the frame of the machine. It will be understood that there is a type bar actuating lever 105, an actuator bar 108 and a pawl 110 for each type bar 101 of the machine.

Positioned below the tail portions 115 of the pawls 110 and in parallel relationship to the drive roller 114 are a plurality of selector slides 131, 132, 133, 134, 135. These selector slides are slideably mounted in stationary supports 136 and 137. The actual positions and relationship of selector slides is shown in Figure 1 while the selector slide 131 is shown in detail in Figure 2. The selector slides are shown diagrammatically in vertical spaced or exploded relationship in Figure 5. When the drive roller 114 is in its full line position illustrated in Figure 1 the nose portions 112 of all pawls 110 rest on the arcuate surface 113 of the drive roller and the tail portions 115 of all pawls are held out of engagement in general vertical spaced relationship from the selector slides 131 to 135.

Each of the selector slides 131 to 135 is provided with a spring member 150 which tends to retain its associated slide in its rightward or full line position shown in Figure 5. The selector slides are provided with solenoids 152, 153, 154, 155, 156 respectively. The solenoid 152 associated with the selector slide 131 is illustrated in Figure 2. The remaining solenoids 153 to 156 associated with the selector slides 132 to 135 are similar and are illustrated diagrammatically in Figure 6. The solenoid 152 is provided with an armature 160 which is pivoted at 161 and which engages notch 162 in the selector slide 131. The solenoids 153 to 156 are similarly equipped and associated with their respective selector slides. It will be seen that energization of any of the solenoids 152 to 156 will move its associated selector slide to the left from the full line position shown in Figure 5. The selector slide 131 is provided with a latch 165 which is pivotally mounted at 166 to the frame of the machine. The latch 165 is urged toward the selector slide 131 by means of a spring member 167 and when the selector slide 131 is moved by its solenoid 152 the latch 165 engages a notch 168 and momentarily retains the selector slide 131 in the shifted position. The se-

lector slides 132 to 135 are provided with similar latches 172, 173, 174 and 175 respectively (see Figure 3).

The drive roller 114 is oscillated through the angle "a" (in counterclockwise direction as seen in Figure 1) by means of a rotary solenoid 180 having an arm 181 connected to the drive roller by means of a link 182. A spring 183 connected to the link 182 and to a stationary portion 184 of the frame of the machine returns the drive roller to its full line position shown in Figure 1 when the rotary solenoid 180 is de-energized.

Energization of the rotary solenoid 180 causes the drive roller 114 to turn through angle "a" in a clockwise direction as seen in Figure 3. A finger cam 190 is pivotally connected to the drive roller 114 at 191 and is biased against a stop member 192 on the drive roller by means of a spring 193. A cam follower 194 is slideably mounted in a portion 195 of the frame of the machine and is positioned above the latch members 165, 172, 173, 174 and 175. Oscillation of the drive roller 114 in a clockwise direction as seen in Figure 3 (caused by energization of the rotary solenoid 180) causes the finger cam 190 to move the cam follower 194 to disengage any of the latches which may be holding selector slides in shifted positions.

The forward end of the actuator bar 108 is guided by a comb guide 200 which is secured to the cross bar 12. Oscillation of the drive roller 114 upon energization of the rotary solenoid 180 will, in a manner hereinafter described, permit the nose portion 112 of a single pawl 110 to enter a groove 205 in the drive roller to engage a shoulder 206 and to cause the pawl 110, the actuator bar 108, type bar actuating lever 105 and type bar 101 to move from the full line positions shown in Figure 1 to the dotted line positions shown in that figure. The stationary bars 210 and 211 cooperate respectively with a finger 212 on the actuator bar 108 and a finger 213 on the pawl 110 for the purpose of disengaging the nose portion 112 of the pawl 110 from the shoulder 206 of the drive roller 114 at a pre-determined time during the movement of the mechanism while performing the printing function. The finger 214 on the actuator bar 108 cooperates with an elbow portion 215 of the pawl 110 to also assist in this disengagement of the pawl from the drive roller. These elements for causing disengagement of the pawl from the drive roller are similar to elements for the same purpose illustrated and described in the above-mentioned Hart Patent No. 2,563,722.

Operation of the printing mechanism and selector slides

For the purpose of describing the operation of the selector slides and printing mechanism it will be assumed that a code signal corresponding to the letter "E" has been received by the apparatus. This code signal may have been received from the keyboard and permutation bar mechanism described above or it may have been received from a remote transmitting mechanism or a tape reader. In any event, the received code signal corresponding to the letter "E" will energize only the solenoid 156 (Figure 6) and will shift the selector slide 135 from the full line position shown in Figure 5 to the dotted line position shown in that figure. The selector slide 135 is retained momentarily in this shifted position by its associated latch 175. The selector slides 131 to 135 will then have notches in their edges adjacent to drive roller 114 which are in alignment, and the tail portion 115 of the pawl 110 associated with the letter "E" is capable of entering those aligned notches, but this is the only tail portion of any pawl which lies above aligned notches in the selector slides. The sixth pulse or printing pulse is then received and serves to energize the rotary solenoid 180 to oscillate the drive roller 114 in the counterclockwise direction as seen in Figure 1. The nose portion 112 of all pawls 110 will drop partially into the groove 205 of the drive roller but all pawls except that cor-

responding to the letter "E" will be restrained by the selector slides from dropping far enough into the groove 205 to engage the shoulder 206. The pawls which are restrained by the selector slides will engage and ride upwardly on the ramp portion 220 of the drive roller. The nose portion 112 of the pawl 110 corresponding to the letter "E" will be engaged by the shoulder 206 on the drive roller 114 and the letter "E" will be printed in a manner which will be apparent from the foregoing description.

As soon as the nose portion 112 of the pawl 110 corresponding to the letter "E" has been engaged by the shoulder 206 and the printing operation has been initiated, the finger cam 190 engages cam follower 194 which operates to release the latch 175 from the selector slide 135. The selector slide then returns to its neutral position under the influence of its spring 150 and all selector slides are then ready for the reception of a subsequent code signal. In this manner the apparatus is capable of preparing itself for printing of a subsequent character while the printing operation of one character is being completed. Upon de-energization of the rotary solenoid 180 the drive roller 114 returns to its original position and during such movement the finger cam 190 rides over the cam follower 194 without movement of the cam follower.

Figure 5 also illustrates the notching of the selector slides for the letters "Y" and "T." It will be understood that the selector slides are notched for all characters and operating functions but it is sufficient for the purpose of understanding the invention to describe the printing of only a few characters. Assuming the apparatus receives the code signal corresponding to the letter "Y," the solenoids 152, 154 and 156 will be energized and the selector slides 131, 133 and 135 will be shifted to permit the tail portion 115 of the pawl 110 corresponding to the letter "Y" to enter aligned notches in the selector slides. The letter "Y" will then be printed in the manner described above. Similarly, if the apparatus receives a code signal corresponding to the letter "T" the solenoid 152 will be energized and the selector slide 131 will be shifted so that the tail portion 115 of the pawl 110 corresponding to the letter "T" will enter aligned notches in the selector slide to cause printing of the letter "T."

The modification of Figure 4

Figure 7 diagrammatically illustrates the wiring diagram for a slightly modified form of the apparatus. The parts which are identical to the elements already described are designated by corresponding reference numerals. In this modification the electromagnet 52a, which corresponds to the electromagnet 52 and the associated permutation bars and springs, is used to close only the switches 61, 62, 63, 64 and 65. Switch 43a, which is closed by depression of any key and which corresponds to the switch 43 in this instance a double-throw switch. The contact 230 is normally closed and serves to maintain relay 231 in energized condition. The winding of relay 231 is shunted by a condenser 232. Contact 233 of relay 231 is open while that relay is energized. Depression of any key on the keyboard actuates switch 43a to open contact 230 and close contact 234. The closing of contact 234 energizes electromagnet 52a to shift the proper permutation bars to actuate the appropriate switch or combination of the switches 61 to 65. The opening of contact 230 breaks the circuit to relay 231, but the condenser 232 prevents that relay from de-energizing for a length of time sufficient for the appropriate shifting of the permutation bars. After a short and predeterminable time relay 231 will become de-energized to close contact 233 and energize printing solenoid 180.

This arrangement assures that the printing function will not be initiated for a brief time interval after the switch 43a has been closed by depressing a key of the keyboard. This time interval is adequate to permit

appropriate shifting of the permutation bars. The time interval can be adjusted by varying the capacitance of the condenser 232. All other portions of the apparatus illustrated in Figure 7 operate in the manner described above.

Attention is called to the fact that the mechanical portions of the apparatus consume no power except during the actual reception and printing of a character. This is an important advantage of the invention in that the machine can be left unattended in a remote location and will utilize no power except when actually receiving and typing a message.

The tail portions 115 of all pawls 110 are maintained out of engagement with the selector slides while those slides are being shifted. This prevents frictional resistance to movement of the selector slides and reduces the amount of power required to operate solenoids 152 to 156.

The teletypewriter according to the present invention is capable of utilizing the chassis, the housing, and many of the conventional parts of the presently commercially available electric typewriter. This fact contributes to economy of production and facilitates the problem of servicing of the apparatus.

I have illustrated and described what I now consider to be the preferred form of my invention. It should be understood that various modifications and alterations may be made without departing from the broader scope of the invention as defined by the following claims.

I claim:

1. In a teleprinter, a key, a plurality of parallel signal permutation bars, a lever extending transversely of said permutation bars and actuated by depression of said key to engage said permutation bars, means biasing each of said bars longitudinally in a first direction, spring means normally overpowering said biasing means and holding said bars against movement in said first direction, said bars having shoulders thereon facing in said first direction toward said lever with the shoulder on at least one of said bars being positioned adjacent said lever and with the shoulders on the remaining bars being spaced from said lever, motor means having an energizing circuit closed by depression of said key and operative to reduce the effect of said spring means on said bars to permit said biasing means to move such remaining bars in said first direction, and switch means responsive to movement of such remaining bars in said first direction to select a code signal.

2. In a teleprinter, a plurality of keys, a plurality of parallel signal permutation bars, a lever for each of said keys extending transversely of said permutation bars and actuated by depression of its respective key to engage said permutation bars, first spring means tending to move each of said bars longitudinally in a first direction, second spring means normally overpowering said first spring means and holding said bars against movement in said first direction, each of said bars having a shoulder thereon for each of said levers and facing in said first direction toward its corresponding lever, a shoulder on at least one of said bars being positioned adjacent its corresponding lever and the corresponding shoulders on the remaining bars being spaced from such lever, motor means having an energizing circuit closed by depression of any of said keys and operative to reduce the effect of said second spring means on said bars to permit said first spring means to move such remaining bars in said first direction, and switch means responsive to movement of such remaining bars in said first direction to select a code signal.

3. In a teleprinter, a key, a plurality of parallel, notched signal permutation bars, a lever extending transversely of said permutation bars, means actuated by depression of said key to cause said lever to engage the notches in said permutation bars, first spring means tending to move each of said bars longitudinally in a first direction, second

spring means normally overpowering said first spring means and holding said bars against movement in said first direction, the notches in said bars forming shoulders facing in said first direction toward said lever with the shoulder on at least one of said bars being positioned adjacent said lever and with the corresponding shoulders on the remaining bars being spaced from said lever, motor means operative to reduce the effect of said second spring means on said bars to permit said first spring means to move such remaining bars in said first direction, a switch closed by depression of said key for energizing said motor means, and switch means responsive to movement of such remaining bars in said first direction to select a code signal.

4. In a teleprinter, a plurality of keys, a plurality of parallel signal permutation bars, a lever for each of said keys extending transversely of said permutation bars, means actuated by depression of each key to move its corresponding lever to engage said permutation bars, first spring means tending to move each of said bars longitudinally in a first direction, second spring means normally overpowering said first spring means and holding said bars against movement in said first direction, said bars having shoulders thereon facing in said first direction toward a bar engaging lever with the shoulder on at least one of said bars being positioned adjacent such bar engaging lever and with the shoulders on the remaining bars being spaced from such lever, motor means operative to reduce the effect of said second spring means on said bars to permit said first spring means to move such remaining bars in said first direction, a single switch operated by depression of any of said keys for energizing said motor means, and means responsive to movement of such remaining bars in said first direction to form a code signal.

5. In apparatus for establishing a code signal, a key, a plurality of parallel signal permutation bars, a lever extending transversely of said permutation bars and actuated by depression of said key to engage said permutation bars, first spring means tending to move each of said bars longitudinally in a first direction, second spring means normally overpowering said first spring means and holding said bars against movement in said first direction, said bars having shoulders thereon facing in said first direction toward said lever with the shoulder on at least one of said bars being positioned adjacent said lever and with the shoulders on the remaining bars being spaced from said lever, motor means having an energizing circuit closed by depression of said key and operative to reduce the effect of said second spring means on said bars to permit said first spring means to move such remaining bars in said first direction, and means responsive to movement of such remaining bars in said first direction to establish a code signal.

6. In apparatus for establishing a code signal, a key, a plurality of parallel signal permutation bars, a lever extending transversely of said permutation bars and actuated by depression of said key to engage said permutation bars, first spring means tending to move each of said bars in a first direction, second spring means normally overpowering said first spring means and holding all said bars against movement in said first direction, certain of said bars having shoulders thereon facing in said first direction toward said lever and positioned adjacent said lever and the remaining bars being devoid of shoulders facing in said first direction closely adjacent said lever, motor means having an energizing circuit closed by depression of said key and operative to reduce the effect of said second spring means on said bars to permit said first spring means to move such remaining bars in said first direction, and switch means responsive to movement of such remaining bars in said first direction to establish the pulses of a code signal.

7. In a teleprinter, a key, a plurality of parallel signal

permutation bars, a lever extending transversely of said permutation bars and actuated by depression of said key to engage said permutation bars, first spring means tending to move each of said bars longitudinally in a first direction, second spring means normally overpowering said first spring means and holding said bars against movement in said first direction, said bars having shoulders thereon facing in said first direction toward said lever with the shoulder on at least one of said bars being positioned adjacent said lever and with the shoulders on the remaining bars being spaced from said lever, motor means having an energizing circuit closed by depression of said key and operative to reduce the effect of said second spring means on said bars to permit said first spring means to move such remaining bars in said first direction, first switch means responsive to movement of such remaining bars in said first direction to select the pulses of a code signal, second switch means responsive to movement of any of said bars in said first direction to provide a printing pulse, an oscillatory drive roller having an arcuate surface thereon and a groove therein, a plurality of selector slides parallel to said drive roller, said selector slides being positioned adjacent a surface of said drive roller generally diametrically opposite said groove, said selector slides having notches in the edges thereof adjacent said drive roller, a type bar actuating lever, an actuator bar connected to said lever, a pawl pivotally mounted on said actuator bar, said pawl having a nose portion, means urging said nose portion toward said drive roller to engage said arcuate surface of said roller and to enter said groove upon oscillatory movement of said roller, said pawl having a tail portion positioned between said roller and the notched edges of said selector slides, said tail portion of said pawl being positioned in spaced relation to said notched edges of said selector slides while said nose portion of the pawl is in engagement with said arcuate surface of said drive roller and said tail portion entering aligned notches in said selector slides when said nose portion enters said groove in said drive roller, selector slide positioning means responsive to said pulses of a code signal to position said selector slides to align notches therein adjacent said tail portion of said pawl, an electromagnet responsive to said printing pulse to oscillate said drive roller to initially cause said nose portion to enter said groove and to subsequently move said actuator bar and said type bar actuating lever, and means for transmitting said pulses of a code signal and said printing pulse to said selector slide positioning means and to said electromagnet respectively.

8. In a teleprinter, an oscillatory drive roller having an arcuate surface thereon and a longitudinal groove therein, a plurality of selector slides parallel to said drive roller, said selector slides being positioned adjacent a surface of said drive roller generally diametrically opposite said groove, said selector slides having notches in the edges thereof adjacent said drive roller, a type bar actuating lever, an actuator bar connected to said lever, a bifurcated pawl pivotally mounted on said actuator bar and straddling said drive roller, said pawl having a nose portion on one leg thereof, means urging said nose portion toward said drive roller to engage said arcuate surface of said roller and to enter said groove upon oscillatory movement of said roller, said pawl having a tail portion on the other leg thereof positioned between said roller and the notched edges of said selector slides, said tail portion of said pawl being positioned in spaced relation to said notched edges of said selector slides while said nose portion of the pawl is in engagement with said arcuate surface of said drive roller and said tail portion entering aligned notches in said selector slides when said nose portion enters said groove in said drive roller, selector slide positioning means responsive to code pulses of a signal to position said selector slides to align notches therein adjacent said tail portion of said pawl, and an

electromagnet responsive to a printing pulse of such signal to oscillate said drive roller to initially cause said nose portion to enter said groove and to subsequently move said pawl, said actuator bar and said type bar actuating lever.

9. In a teleprinter, an oscillatory drive roller having an arcuate surface thereon and a longitudinal groove therein, a plurality of selector slides parallel to said drive roller, said selector slides being positioned adjacent a surface of said drive roller generally diametrically opposite said groove, said selector slides having notches in the edges thereof adjacent said drive roller, a type bar actuating lever, an actuator bar connected to said lever, a pawl pivotally mounted on said actuator bar, said pawl having a nose portion and a tail portion, means urging said nose portion toward said drive roller to engage said arcuate surface of said roller and to enter said groove upon oscillatory movement of said roller, said tail portion being positioned between said roller and the notched edges of said selector slides and being in spaced relation to said notched edges of said selector slides while said nose portion of the pawl is in engagement with said arcuate surface of said roller, said tail portion entering aligned notches in said selector slides when said nose portion enters said groove in said drive roller, selector slide positioning means responsive to code pulses of a signal to position said selector slides to align notches therein adjacent said tail portion of said pawl, and an electromagnet responsive to a printing pulse of such signal to oscillate said drive roller to initially cause said nose portion to enter said groove and to subsequently move said pawl, said actuator bar and said type bar actuating lever.

10. In a teleprinter, an oscillatory drive roller having an arcuate surface thereon and a groove therein, a plurality of selector slides parallel to said drive roller, said selector slides being positioned adjacent a surface of said drive roller generally diametrically opposite said groove, said selector slides having notches in the edges thereof adjacent said drive roller, a type bar actuating lever, an actuator bar connected to said lever, a pawl pivotally mounted on said actuator bar, said pawl having a nose portion, means urging said nose portion toward said drive roller to engage said arcuate surface of said roller and to enter said groove upon oscillatory movement of said roller, said pawl having a tail portion positioned

between said roller and the notched edges of said selector slides, said tail portion of said pawl being positioned in spaced relation to said notched edges of said selector slides while said nose portion of the pawl is in engagement with said arcuate surface of said drive roller and said tail portion entering aligned notches in said selector slides when said nose portion enters said groove in said drive roller, selector slide positioning means responsive to code pulses of a signal to position said selector slides to align notches therein adjacent said tail portion of said pawl, latch means retaining said selector slides in such notch aligned position, an electromagnet responsive to a printing pulse of such signal to oscillate said drive roller to initially cause said nose portion to enter said groove and to subsequently move said pawl, said actuator bar and said type bar actuating lever, and cam means carried by said drive roller and operative upon oscillatory movement of said roller to disengage said latch means.

11. In a teleprinter, a key, a plurality of parallel signal permutation bars, a lever extending transversely of said permutation bars and actuated by depression of said key to engage said permutation bars, first spring means tending to move each of said bars longitudinally in a first direction, second spring means normally overpowering said first spring means and holding said bars against movement in said first direction, said bars having shoulders thereon facing in said first direction toward said lever with the shoulder on at least one of said bars being positioned adjacent said lever and with the shoulders on the remaining bars being spaced from said lever, motor means having an energizing circuit closed by depression of said key and operative to reduce the effect of said second spring means on said bars to permit said first spring means to move such remaining bars in said first direction, first switch means responsive to movement of such remaining bars in said first direction to select the pulses of a code signal, and second switch means responsive to movement of any of said bars in said first direction to provide a printing pulse.

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