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TSUNEHARU YAMURA ET AL

2,974,193

TELEGRAPHIC APPARATUS

Filed April 7, 1958

3 Sheets-Sheet 1

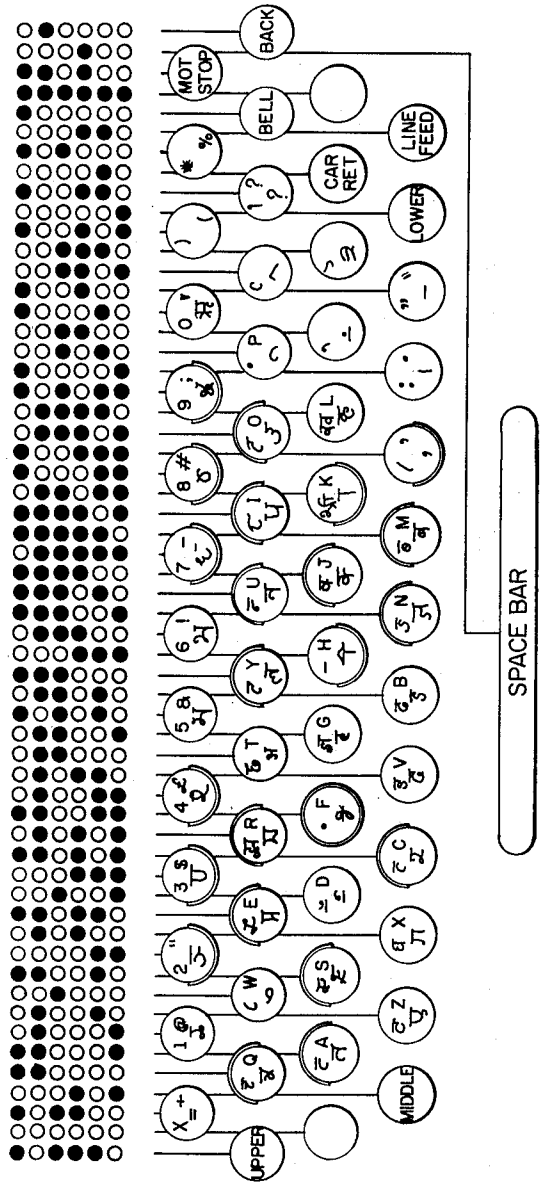


FIG 1

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3 Sheets-Sheet 2

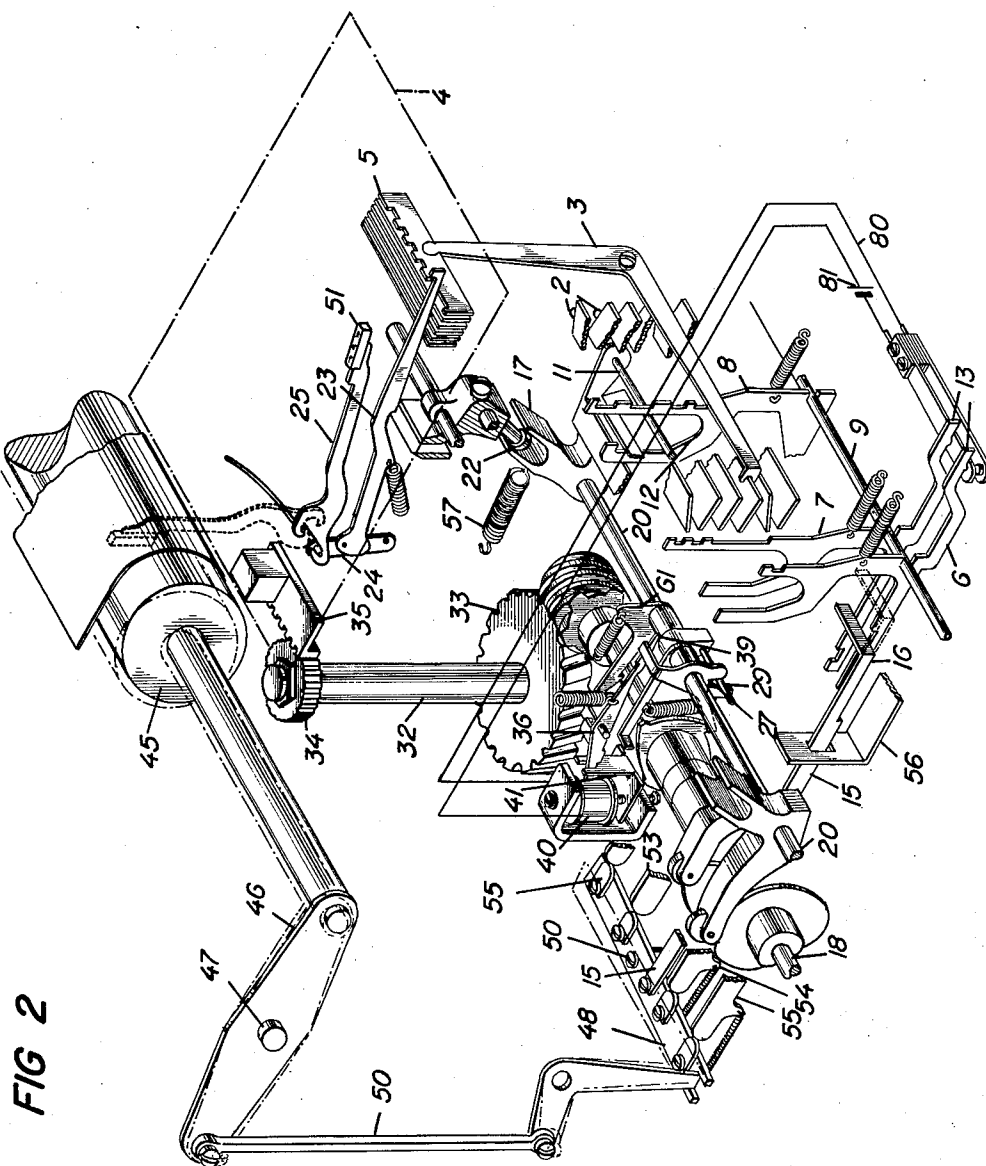


FIG 2

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3 Sheets-Sheet 3

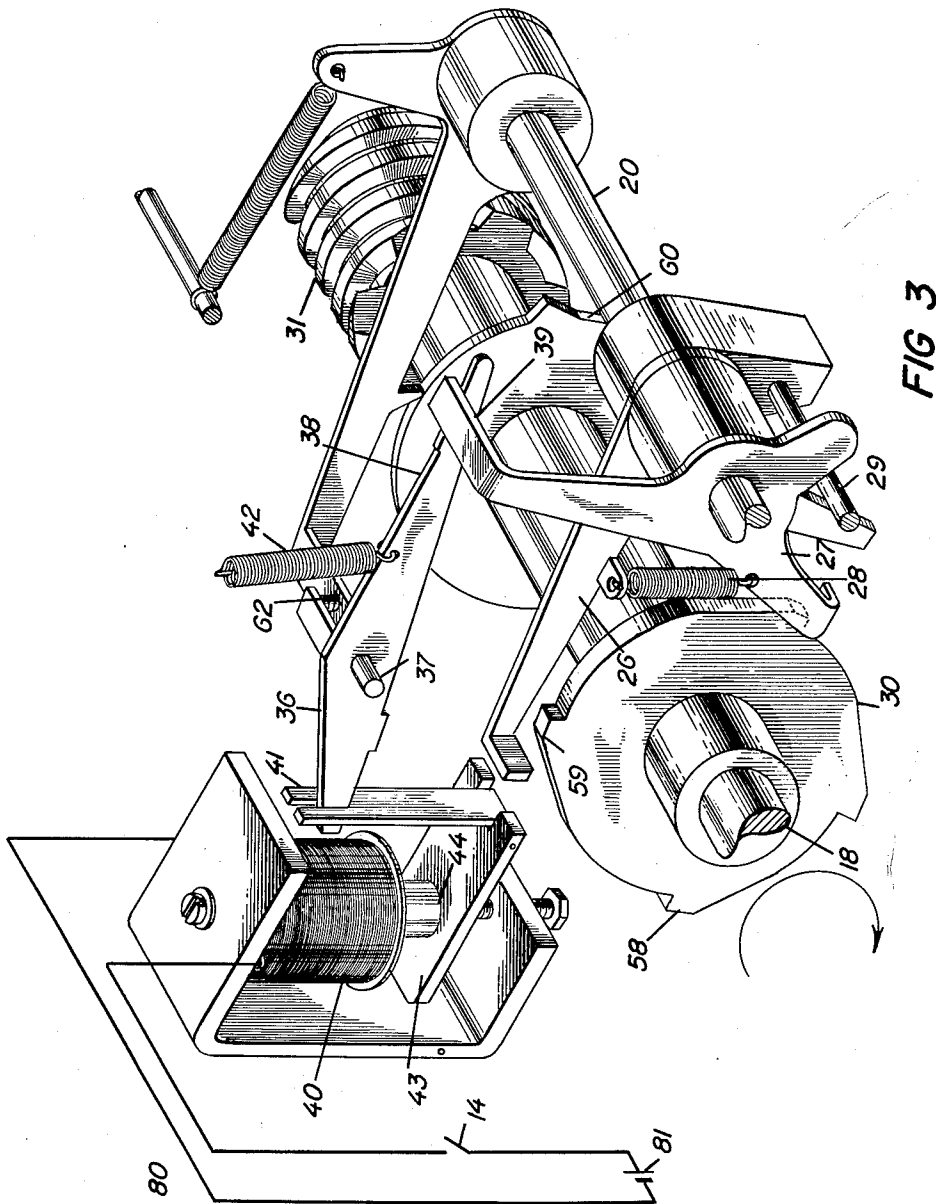


FIG 3

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TELEGRAPHIC APPARATUS

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This invention relates to a telegraphic apparatus of the multistep type wherein a certain number of the typed marks will have a common part mark and in which the shifting and the operating movement of the function lever corresponding to such common part mark are correlated.

It is an object of the invention to provide an apparatus wherein with respect to certain letters that are to be typed, the spacing of the carriage is less than the normal spacing only when such special letters are typed.

A further object of the invention is to provide a telegraphic apparatus which is suitable for use with the English language or a language such as the Indian. For example, in India the demand exists for an apparatus that is capable of handling both the usual alphabet such as A, B, C, etc., and Hindu letters. In the typing of the letters of the alphabet the spacing of the carriage is constant for each letter. However, some Hindu letters are composed of two types of letters wherein some letters are spaced from one another the normal space, while other letters are spaced only approximately one half of such space. Furthermore, these two types of letters are sometimes combined so as to form one letter.

A further object of this invention is therefore to provide means to form a letter so that when a full spaced letter and a half spaced letter are combined for typing there is provided means for the half spacing and also means for carrying out the full spacing when required.

A preferred embodiment of the invention with reference to a three-step shift telegraphic apparatus is shown in the accompanying drawings, in which:

Figure 1 is a diagrammatic view of a keyboard arrangement and the table for typing marks according to the invention.

Figure 2 is a perspective view of the essential portions of an apparatus according to the invention wherein some portions are shown partially in section, and

Figure 3 is an enlarged perspective view of a portion of the apparatus shown in Figure 2.

Referring to Figure 1, the keyboard illustrates an arrangement which is suitable for use in India wherein both the English alphabet and Hindu letters are employed. The upper stage contains the alphabet letters and marks while the middle and lower stage contain Hindu letters and numerals respectively.

In Figure 1 the keys marked by a semi-circle are keys for a half-spacing and there are twenty in number. Of the keys having the upper semi-circle only the Hindu letters are in the middle step for the half letter spacing and the keys having the lower circle only, the Hindu letter at the lower position have the half letter spacing. The keys having the double circles the letters in the middle and lower position show the half-spacing letters. These half-spacing letters may be combined with other full letters and form an independent letter. So that for typing the half spacing letter in the middle step a half-spacing is carried out by the apparatus and when the alphabet in the upper position and the full spacing letter

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contained in the lower position are selected, then a full spacing is carried out by the apparatus.

For typing the half-spacing letter contained in the middle and lower position the half-spacing means must be used and only when the alphabet in the upper position is typed then the full spacing must be used.

In order to carry out the invention as shown in Figure 1, the marks arranged in the middle position on the type bars are marks which become a composite mark and can be established with one middle half letter function lever 6 as shown in Figure 2. The half-letter marks arranged in the lower position on the type bars are made composite by means of one lower letter function lever 7 and by combining the selective operation of these half-letter function levers 6 and 7 and the shifting operation of the platen 45 a half-spacing of the marks can be carried out when half-spaced letters are typed.

Referring to Figure 2 the essential construction and operation will be explained in detail. At 1 a selector vane is shown and there are six in number corresponding to the six units telegraphic marks and each of them is connected to known selective parts which are not shown and can rotate about the axis 2 thereby coming to the mark position or the space position and selects a code bar 5 of the carriage type basket 4 to the mark position or space position through the six bell cranks 3 of which only one is shown in the drawing.

Two half-spacing letter function levers 6 and 7 are held with the other function lever group 8, of which only one is shown, by a shaft 9 and tend to rotate towards the selector vane 1 under the action of the spring 10. However, usually the function lever bail shaft 11 acts upon the oblique face 12 of the function lever and separates it slightly from the rear edge of the selector vane 1 so that such selector vane can rotate freely for selecting the mark from the selector part.

The right hand ends 13 of the half-spacing letter function levers 6 and 7 are correlated with the contact point 14 and their left hand ends, as shown in Figure 2, are provided with notches to cooperate with the L-shaped bar 16 of the shift link 15. The function lever bail shaft 11 is fixed to the printing arm 17 which is rotated about a printing arm shaft 20 by the printing cam 19 upon the main shaft 18 which is rotated upon each completed selection.

The upper end of the printing arm 17 engages a roller 22 of the pull bar bail 21 which is fixed to the carriage type basket 4 and when operated pulls the pull bar 23, the pull bar lever 24 and the type bar 25. Only one set is shown in the drawings and they carry out the usual typing action.

In Figure 3, both the upper and lower escapement pawls 26 and 27 respectively are fitted on the printing arm shaft 20 and are urged towards one another by the spring 28. They can rotate the spacing ratchet 30 by an oscillating motion brought about by the typing motion of the printing arm 17 of the escapement bail 29 fastened to the printing arm shaft 20.

The spacing ratchet 30 is fitted on the main shaft 18 which rotates constantly in the direction shown by the arrow by a friction clutch. When an end of the lower escapement pawl 27 engages a tooth of the four teeth provided upon the spacing ratchet 30 such rotation is prevented. The spacing ratchet 30 is fixed or integral with the spacing gear 31 and transmits a rotation of the spacing ratchet 30 to the rack 35 mounted upon the carriage type basket 4 through the gears 33 and 34 fixed upon the spacing shaft 32. This spaces the type basket 4 upon each typing operation.

The escapement lock lever 36 is fixed to the shaft 37 and the right hand end as shown in Figure 3 is formed as a latch 38 which engages with the upper lock part 39

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provided upon the lower escapement pawl 27 on the spacing of a full letter typing and the left portion of the escapement lock lever 36 is connected to an armature link 41 of the magnet 40 and tends to separate the armature 43 from the magnet core 44 under the tension of a spring 42.

The platen 45 is supported upon the platen supporting lever 46 and through the link 50 of the bell crank lever 49 may be shifted in three steps corresponding to the position of the three letters provided upon the type 51 of the type bar 25 under the selective rotational motion of the shift lever 48 about the pivot 47 serving as the fulcrum point. The shift lever 48 has an upper push bar 53 and a lower push bar 54 and two middle push bars 55 located at both sides of the shaft or pivot 52 and on the right end of the shift link 15 to which is fixed the L-shaped lever 16 which can move towards the right or left contacting the upper face of the guiding groove provided in the guide plate 56 by the selective rotational movement of the shift lever 48.

The operation of a key comprising the half-spacing letters in the middle and lower step of the keyboard arrangement will now be explained. When the upper letter mark from an alphabet is received the printing cam 19 rotates at the same time when the selection of the mark is completed and the printing arm 17 rotates anticlockwise according to the action of the cam and the printing arm spring 57. Then the function lever bail shaft 11 is released from the oblique surface 12 of each function lever so that the front surface of each function lever contacts with the rear edge of the selector vane 1.

In this case, as the platen 45 is held in its upper position as shown by the dotted lines in Figure 2, the shift lever 48 rotates anti-clockwise around the shaft 52 and the L-shaped lever 16 of the shift link 15 goes to the right as shown in dotted lines in Figure 2. Therefore the extensions upon the half-letter spacing function levers 6 and 7 extending to the left as shown in Figure 2 are prevented from entering into the selective action with respect to the selector vane 1 by the end of the L-shaped bar 16.

By the anticlockwise rotation of the printing arm 17, the lower equipment pawl 27 is rotated also anticlockwise through the action of the escapement bail 29 and the upper end 39 of the pawl 27 engages with the latch 38 of the escapement lock lever 36 and thereby locks the lower escapement pawl 27, see Figure 3.

At this time the lower end of the escapement pawl 27 releases the tooth of the spacing ratchet 30 and simultaneously the upper escapement pawl 26 is moved anticlockwise by the spring 28 and rotates the spacing ratchet 30 slightly until the tooth 58 of the spacing ratchet 30 engages the end of the upper escapement pawl 26. In the meantime, the pawl bar bail 21 is rotated clockwise by the anticlockwise rotation of the printing arm 17 and engages only the selected pawl bar 23 which actuates the associated type bar 25 against the platen 45 by the lever 24 and thereby types the upper letter upon the type bar.

Upon the return clockwise rotation of the printing arm 17 after the completion of the typing, the escapement bail 29 operates the upper escapement pawl 26, releases its engagement with the spacing ratchet 30 and allows rotation of the spacing ratchet 30. Since the lower escapement pawl 27 is locked by the escapement lock lever 36 the tooth 59 of the spacing ratchet 30 can pass the lower end of the escapement pawl 27 and immediately after such passing the cam 60 which is connected with the spacing ratchet 30 and has four extensions thereon pushes upwardly the cam lever 61 which is fixed to the printing arm shaft 20 and thereby pushes upwardly the left hand lower part of the escapement lock lever 36 by means of the screw 62 at the left hand end of the cam lever 61 as shown in Figure 3 and thereby releases the locking of the escapement pawl 27 which then rotates clockwise. In this way the tooth 58 of the spacing ratchet

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30 comes into contact with the lower end of the lower escapement pawl 27 and the rotation of the ratchet is stopped.

When the full letter is typed the spacing ratchet 30 rotates a half revolution and spaces the type basket 4 by a one letter spacing by means of the spacing shaft 32. Next, when the platen 45 is in the middle position as shown in full lines in Figure 2 and the letter mark of the letter to be half-spaced is received and selected, each function lever 6 and 7 is released and contacts the rear edge of the selector vane 1 by the rotation of the printing arm 17. In this case only the middle half function lever 6, since the center of the groove at the left hand extended portion of it is located just under the L-shaped bar 16, rotates selectively and closes the contact point 14. Since the groove upon the left hand extension of the lower half space function lever 7 does not correspond with the L-shaped bar 16 such lever is not selected.

The contact point 14 is connected in series with the magnet 40 by the circuit 80 and battery 81. The magnet 40 is energized and the armature 43 is attracted thereby rotating the escapement pawl lock lever 36 clockwise by means of the armature link 41 which thereby holds the escapement pawl 27 in such a way that it is not locked. By the anticlockwise rotation of the printing arm 17 the upper escapement 26 rotates anticlockwise under the action of the spring 28 and contacts the outer circumference of the escapement ratchet 30 and rotates the lower escapement pawl 27 anticlockwise thereby releasing its engagement with the escapement ratchet 30 so that the selected half letter spacing typing is carried out at the same time when the ratchet 30 rotates until the tooth 58 of the ratchet 30 is held by the end of the upper escapement pawl 26.

Upon the following return rotational motion of the printing arm 17 the escapement bail 29 rotates clockwise and releases the lower escapement pawl 27 which also moves clockwise. In this case as the magnet 40 is energized the lock lever 36 does not lock the lower escapement pawl 27 which under the action of the spring 28 moves into contact with the outer circumference of the ratchet 30 and at the same time the upper escapement pawl 26 being rotated clockwise thereby releasing its engagement with the tooth 58 of the ratchet 30 permitting rotation of the ratchet 30, the tooth 59 of the ratchet 30 is locked by the lower end of the lower escapement pawl 27. The spacing ratchet 30 thereby rotates a quarter of a revolution and the basket 4 will make a half spacing of one letter. When the platen 45 is in the lower step and the letter mark of the half letter is received, since the center of the groove of the left hand extension of the lower half letter function lever 7 is in correspondence with the position of the L-shaped bar 16, the selective insertion is carried out and contact point 14 is closed. Therefore when the lower half letter function lever 7 is selected the half letter corresponding thereto is typed and the operation as mentioned above is carried out and the spacing is one half spacing of one letter.

Accordingly when the half spacing letter is in the middle step or lower step and is received selectively, the selective operation of the half letter function levers 6 and 7 and the typing operation is carried out at the same time, the magnet 40 being energized in order to prevent the locking of the lower escapement pawl 27 and thereby permitting the rotation of the spacing ratchet 30 by a quarter revolution, a one half spacing of a letter is carried out and when the full letter is to be typed the lower escapement pawl 27 being locked and the spacing ratchet 30 being rotated for one half a revolution then the spacing of one letter is carried out.

In the above the construction has been explained with reference to a type bar carriage of a telegraphic receiving apparatus but in the case of a platen carriage this function can also be easily carried out.

It is thought that the invention and its advantages will

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be understood from the foregoing description and it is apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing its material advantages, the form hereinbefore described and illustrated in the drawings being merely a preferred embodiment thereof.

We claim:

1. In a telegraphic receiving apparatus the combination comprising a shiftable platen, means for shifting said platen, a plurality of type bars each having a plurality of characters in a carriage type basket, means for actuating said type bars, code bars for selecting which of said type bars are to be actuated, selector vanes cooperating with said code bars, operating means operable in response to a received signal for operating said actuating means, spacing means coacting with said type basket, said spacing means comprising means for spacing said type basket a full spacing upon receipt of a predetermined signal and means for spacing said type basket one half a full spacing upon receipt of another predetermined signal.

2. In a telegraphic receiving apparatus the combination comprising a shiftable platen, means for shifting said platen, a plurality of type bars each having a plurality of characters in a carriage type basket, means for actuating said type bars, code bars for selecting which of said type bars are to be actuated, selector vanes cooperating with said code bars, operating means operable in response to a received signal for operating said actuating means, spacing means coacting with said type basket, a ratchet controlling said spacing means and means coacting with

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said shifting means and said selector vanes controlling said ratchet to provide for a full spacing of said basket or one half of a full spacing upon receipt of predetermined signals.

3. In a telegraphic receiving apparatus as set forth in claim 2 wherein a shift link is connected to said shifting means, and a pair of half letter function levers cooperate therewith for coaction with said selector vanes for controlling said ratchet.

4. In a telegraphic receiving apparatus as set forth in claim 2 wherein a lower escapement pawl and an upper escapement pawl cooperate with said ratchet and means are provided controlling the operation of said pawls for locking and releasing said ratchet.

5. In a telegraphic receiving apparatus as set forth in claim 4 wherein said last named means comprises a magnet, an armature therefor and an escapement lock lever controlled by said armature.

6. In a telegraphic receiving apparatus as set forth in claim 5 wherein the circuit for said magnet is controlled by said means coacting with said shifting means and said selector vanes.

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