

Aug. 10, 1943.

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2,326,298

TYPEWHEEL STOP UNIT

Filed July 21, 1942

FIG. 2

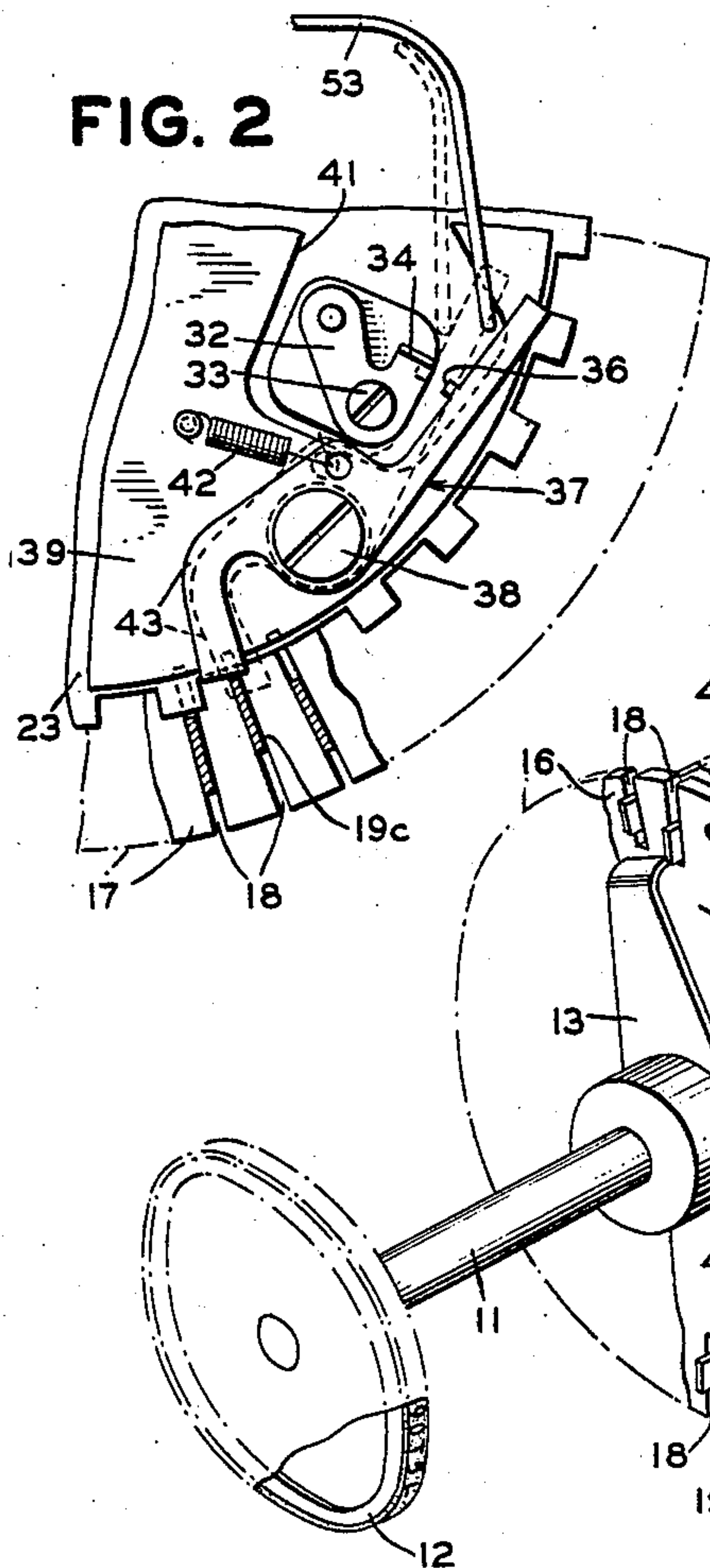


FIG. 1

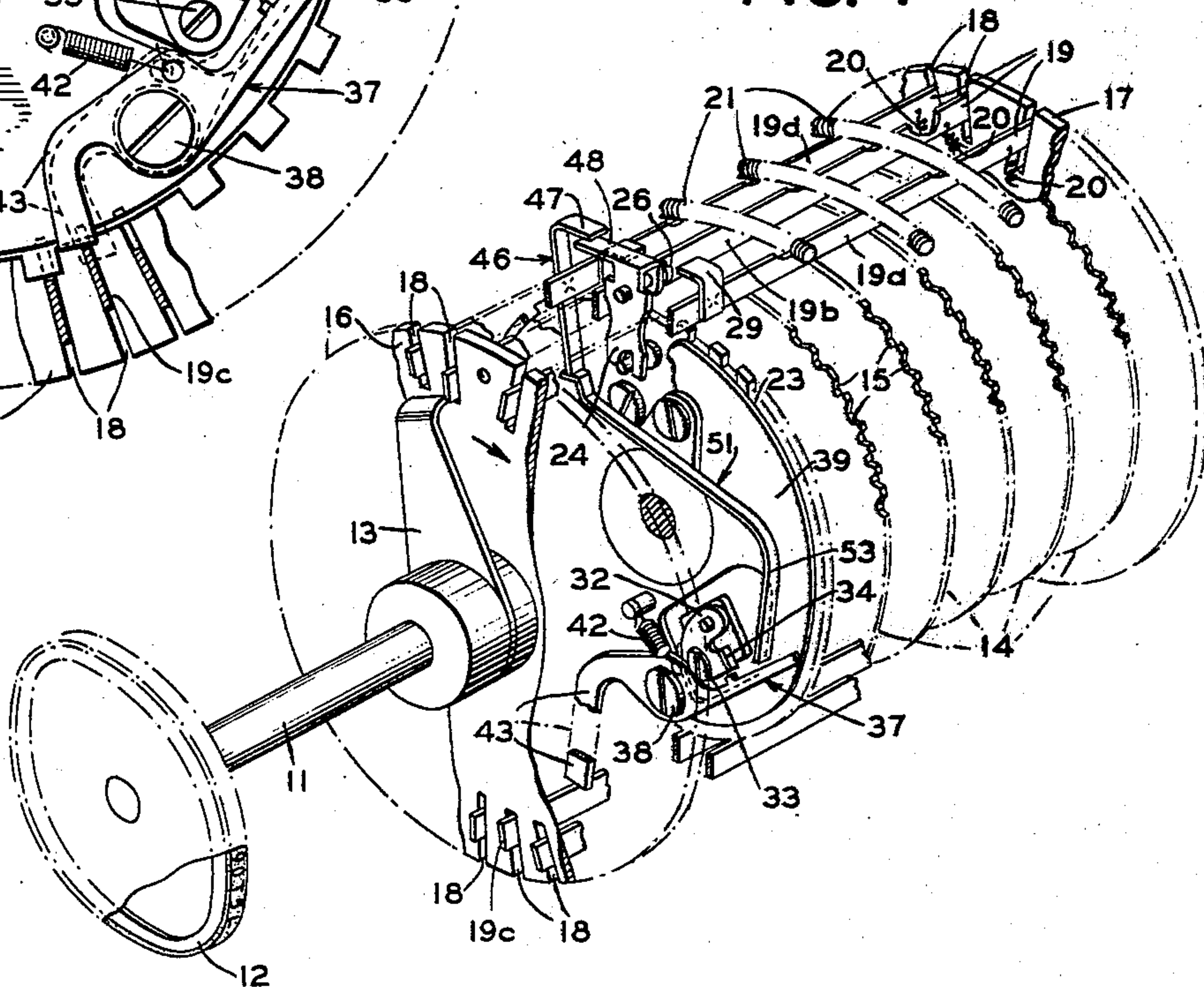
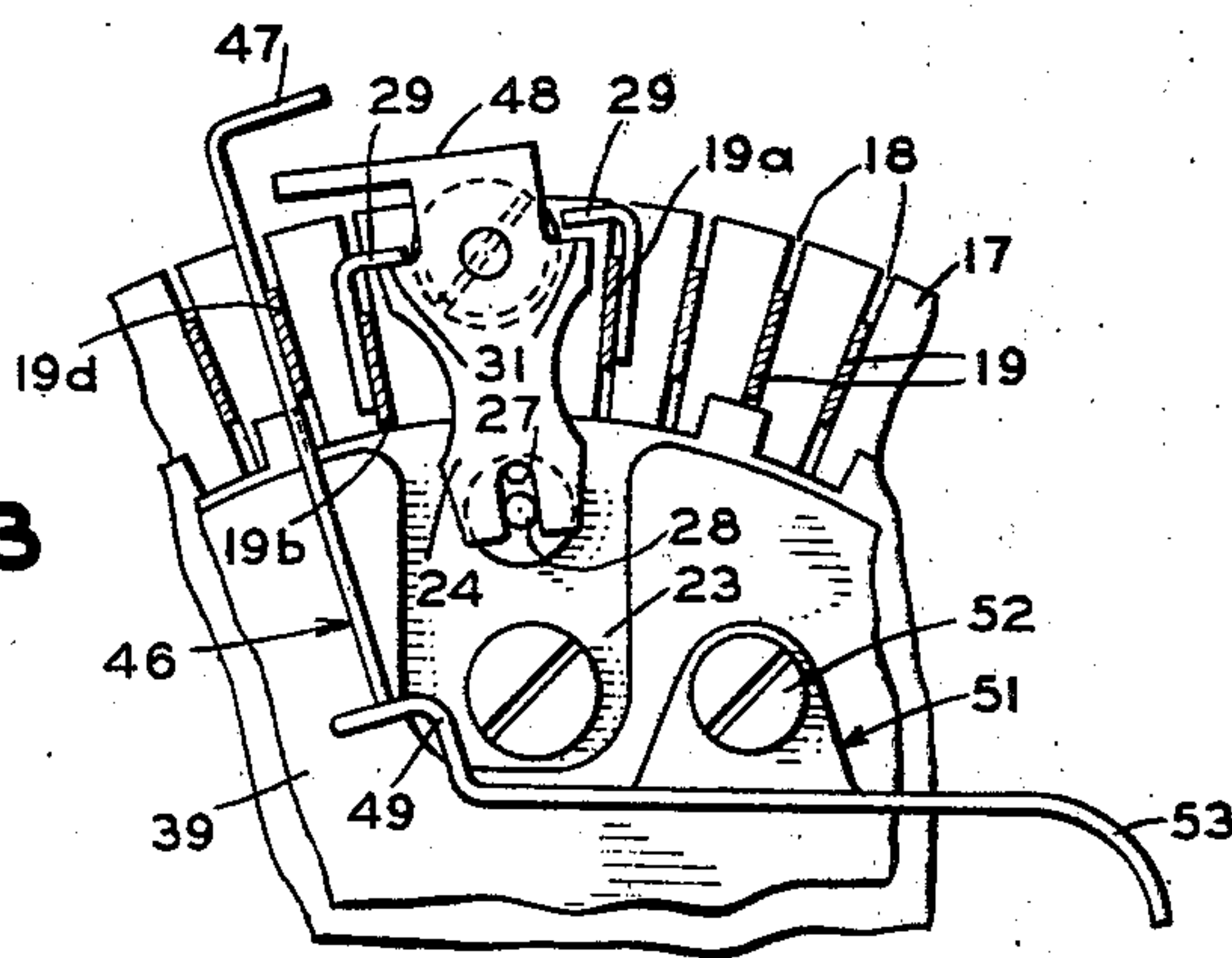


FIG. 3



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2,326,298

TYPE WHEEL STOP UNIT

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Application July 21, 1942, Serial No. 451,694

8 Claims. (Cl. 173—34)

The present invention relates primarily to typewheel shaft stop units of the type employed in telegraph recorders to selectively position the typewheel in accordance with received code groups of impulses prior to a recording or other functions of the recorders.

Telegraph recorders of the type that include typewheels in the recording units usually employ typewheel shaft stop units which are selectively controlled in accordance with the received signals to angularly position the typewheel shaft and typewheel rotatable therewith so that the desired character on the typewheel is placed in printing position. The stop units include notched code discs which are selectively positioned angularly into one or the other of two positions in accordance with respective signaling impulses of the code groups to form various alignments of notches in the peripheries of the code discs. Surrounding the code discs are a series of selectable members which are urged toward the centers of the discs and, when one or more notches in a disc are in alignment with one or more notches in each of the other discs, one or more of the selectable members are permitted to move inwardly into the aligned row or rows of notches to a selected position. Extending through the center of the code discs is a frictionally driven typewheel shaft which has rotatable therewith a typewheel and a stop arm. The stop arm normally passes underneath the selectable elements, but when one is selected by entering a row of aligned notches in the code discs, it moves into the path of the stop arm to stop the typewheel in a corresponding position.

Telegraph recorders usually operate in response to a five-unit code, and as there is a code disc for each unit or variable impulse of the code, there are also five code discs. With five code discs a total of 32 permuted settings thereof are possible, and accordingly by employing five code discs any one of 32 selectable elements may be selected one at a time. In order to increase the possible number of selections, a so-called shift disc is sometimes employed. This disc is positionable into one or the other of two positions in response to shift and unshift signals and is usually operated from one position to the other by two corresponding predetermined selectable elements of the stop unit. If two rows of notches exist in the code discs for each permuted setting thereof, the shift disc may be employed to determine which one of the associated selectable elements is selected. Thus, the number of selectable elements which are selectable one at a time

can be increased to approximately double the number possible without the shift disc.

The two predetermined selectable elements are usually operative to directly shift the shift disc from either one to the other of its two positions, in which position it should remain until the selection of the other one of the controlling selectable elements. The shift disc should be relatively easy to move in order to impose no more load than is absolutely necessary on the two selectable elements employed to shift the same. With an easily movable shift disc it may accidentally move from one position to the other, which results in inadvertently printing of upper case characters for lower case, or vice versa.

In accordance with the above, it is one of the main objects of the present invention to provide a positive lock for the shift disc in stop units of the above type whereby the shift disc may be positively locked in either one of its operated positions and which will retain the shift disc in a locked position until it is desired to change the position thereof in response to an opposite shift controlling signal.

The lower case characters are usually transmitted in greater numbers than the upper case characters, and the usual practice when transmitting letters or lower case characters which are to have inserted therein a number of upper case characters or figures is to transmit a shift signal preceding the figure characters and then transmit an unshift signal following the same. In certain types of telegraph service the figure characters are interposed into the letter characters more or less frequently and obviously require the transmission of a shift and an unshift signal preceding and following each group of figure characters. No useful function in the printer is performed on the receipt of the shift and unshift signals other than to properly condition the printer, and obviously such practice is wasteful of line time.

Accordingly, it is another object of the present invention to provide a typewheel stop unit of the drum type employing a shift disc which automatically moves from a shift to an unshift signal on the receipt of a predetermined group of signals such as the letter space signal. The letter space signal is ordinarily transmitted following each group of figure characters and hence is effective to return the printer to its unshift position without the necessity of also transmitting an unshift signal.

A more specific object of the invention is to provide a stop unit of the above type wherein

the shift disc is automatically moved to an unshift position in response to a letter space signal or which may be moved to its unshift position in response to an unshift signal.

The above and further objects of the invention will be more apparent from the following detailed description thereof when taken in conjunction with the accompanying drawing, in the latter of which:

Fig. 1 is an exploded perspective view of a type-wheel stop unit embodying therein the present invention and showing the manner in which the elements of the present invention cooperate with the elements of the stop unit;

Fig. 2 is an enlarged detailed view of the shift disc locking elements; and

Fig. 3 is an enlarged detailed view of the shift disc operating elements.

Referring now to the drawing, the elements comprising the present invention and the manner in which they operate and combine with the elements of a drum type stop unit to accomplish the above objects will now be described in detail. The stop unit shown is of the type such as that described in considerable detail in a copending application of R. F. Dirkes et al., Serial No. 318,021, filed February 9, 1940, and hereinafter the description of the well-known elements of the stop unit will be limited to the manner in which they cooperate with the elements comprising the present invention. Although the invention is shown and herein described as cooperating with this particular type of stop unit, it will be obvious that the application of the invention is not limited to this particular stop unit but may be applied to various other specific types. The stop unit includes the usual type-wheel shaft 11, Fig. 1, which is frictionally driven from a suitable source of power at the desired speed through a friction clutch (not shown). As shown in the drawing, the type-wheel shaft has fixed directly thereto a type-wheel 12 which has but a single row of characters on the periphery thereof. Also fixed to the typewheel shaft 11 for rotation therewith is a stop arm 13 which, in a manner hereinafter described, effects stopping of the typewheel shaft and typewheel 12 in selected angular positions.

The stop unit also includes a set of five differently notched code discs 14, the notches 15 in the code discs being located in the peripheries thereof. The code discs are mounted concentrically with the typewheel shaft in the usual manner and are rotatably movable or shiftable within predetermined limits about the typewheel shaft 11. A set of transfer bars (not shown) are usually employed to permutatively set the code discs 14 in accordance with the setting of a corresponding set of selectors which are positioned in accordance with received code groups of impulses.

Located at each end of the stop unit are guide discs 16 and 17 which are slightly larger in diameter than the code discs 14 and have arranged around the peripheries thereof a series of radial slots 18. Located in the slots 18 are selectable elements or stop members 19 which are urged inwardly toward the center of the typewheel shaft by means of resilient bands such as garter or circular coiled radially contractable springs 21. The springs 21, in urging the stop members 19 inwardly, hold the same in engagement with the peripheries of the code discs 14, and when an aligned row of notches in each of the code discs 14 are formed beneath

one of the stop members 19, the said stop member is permitted to move inwardly a slight amount into the aligned row of notches to a selected position. As the notches 15 in each code disc 14 are in a different arrangement or order, various rows of aligned notches therein may be formed, depending upon the permuted settings of the code discs.

With five code discs 14, the usual number employed, thirty-two permuted settings thereof are possible, and as more than thirty-two characters are required to transmit telegraph messages, shift and unshift signals are employed. The shift and unshift signals control the position of a shift disc 23, and it in turn determines which one of two stop members 19 is selected when the code discs are position so that two rows of notches are in alignment and in operative relation with the two selectable elements or stop members 19. Thus, if the code discs are so arranged that for some permuted settings thereof two rows of notches exist therein, the position of the shift disc 23 will determine which one of the associated stop members is selected. In this manner the number of possible selections may be practically doubled over the number possible with but the five code discs 14.

The shift disc 23 has no associated selector to control the position thereof, but it is normally moved or shifted from one position to the other, as hereinafter pointed out, by shift and unshift stop members such as 19a and 19b, respectively, the said stop members being selected in response to shift and unshift signal code groups. The shift and unshift stop members 19a and 19b are located adjacent each other, and positioned between these two stop members is a shift lever 24, Figs. 1 and 3. This shift lever 24 is pivotally mounted on a shoulder screw 26 supported in the front guide plate 16 and has a bifurcation 27 therein which engages a pin 28 extending axially from the side of the shift disc 23. Secured to the shift and unshift stop members 19a and 19b by some means, such as spot welding, are angular brackets 29 which are arranged so as to engage shoulders 31 on opposite sides of the shift lever 24.

With the shift disc 23 in its unshift position, or the position shown in Fig. 3, the selection of the shift stop member 19a causes the bracket member 29 thereon to engage the right hand shoulder 31 of the shift lever 24 to pivot the said lever in a clockwise direction. As the shift lever pivots in this direction, the bifurcation 27 engaging the pin 28 shifts the disc 23 in a counterclockwise direction into its shift position. As one stop member, such as the shift stop member 19a is selected, the previously selected member will be cammed back into its normal position in the usual manner by the sloping edges of the notches 15 in the code discs 14. With the shift disc 23 in its shift position, the subsequent selection of the unshift stop member 19b effects pivoting of the shift disc 23 in a clockwise direction into its unshift position. Thus, the selection of either the shift or unshift stop members controls the position of the shift disc 23, and it, as before described, controls the selection of either one set or the other set of stop elements 19. The shift and unshift stop members 19a and 19b may have an appreciable amount of work to do in moving the shift disc 23, and individual helper springs such as 20 attached to the stop members may be employed to assist the garter

springs 21 in urging the said stop member inwardly. Other special stop members such as 19c and 19d hereinafter described may also have helper springs such as 20.

The shift and unshift stop members do not remain in selected positions during the selection of other stop members, and hence do not have any effect in keeping the shift disc 23 in either one or the other of its two positions. Detents are sometimes employed to bias the shift disc into either of its two positions, but the effect of the detents must be overcome when it is desired to move the shift disc. This places additional load on the shift and unshift stop members and necessitates strong garter springs 21 and/or helper springs 20. With strong garter springs, a considerable amount of power is required to cam a selected stop member back into its normal unselected position, and this imposes an unnecessary load on the transfer mechanism, resulting in premature wearing and other obvious disadvantages. In order to eliminate the disadvantage of placing a heavy load on the transfer mechanism which is operative to selectively position the code discs 14, the shift disc 23 should be easily shifted. With the shift disc easily shiftable, the jarring, vibration, etc., of the printer incident to the normal operation thereof may overcome the detent, if employed, and accidentally shift the shift disc in either direction at the wrong time, since neither of the shift stop members is at all times operative to bias the shift disc in one or the other of its two positions.

In order to have a shift disc that is easily movable with the attendant advantages, while at the same time preventing the movement thereof during the selection of character determining stop members, a lock for the shift disc is provided in accordance with the present invention which is effective to lock the shift disc in either of its operated positions and prevent undesired movement thereof. The locking arrangement for the shift disc includes a lock plate 32, Figs. 1 and 2, attached by means of a screw 33 to the side of the shift disc 23. The lock plate 32 has an axially extending projection 34 extending parallel to the typewheel shaft 11 in operative relation with a projection 36 on a lock lever 37. The lock lever 37 is pivotally mounted on a shoulder screw 38 supported in a stationary mounting plate 39 located between the front guide plate 16 and the shift disc 23. An opening 41 is formed in the guide plate 39 so as to permit the lock plate and the projection 34 thereof to extend therethrough. The lock lever 37 has a spring 42 attached thereto which tends to pivot the same in a counterclockwise direction and holds the end of the lower arm 43 thereof in engagement with the inner edge of a shift disc lock stop member 19c. With the stop member 19c in its normal unselected position and the shift disc 23 in its shift position such as that shown in Fig. 2, the projection 35 on the lock lever 37 will be positioned below the projection 34 on the lock plate and thereby prevent the movement of the shift disc in a clockwise direction to its unshift position. Such a position of the lock lever is shown by the dotted outline thereof in Fig. 2.

In accordance with the present invention, the shift disc lock stop member 19c is arranged to be selected or moved inwardly on the selection of either one or the other of the shift or unshift stop members 19a and 19b, respectively. On the selection of the shift disc lock stop member 19c, the inner edge thereof engages the end of the arm 43

of the lock lever 37 to pivot the same in a clockwise direction to withdraw the projection 36 thereon from operative relation with the projection 34 of the lock plate 32. Hence, if the shift disc 23 is in its shift position and the unshift stop member 19b is selected, the stop member 19c being selected simultaneously therewith unlocks the shift disc 23 and permits the unshift stop member to move the shift disc to its unshift position. The next selection of a character representing stop member is effective to cam the previously selected unshift stop member 19b and the shift disc lock stop member 19c back into their normal positions, whereupon the spring 42 pivots the lock lever 37 to place the projection 36 in operative relation with the upper side of the projection 34 on the lock plate 32. The shift disc 23 is thus locked by means of the projection 36 being in the path of movement of the projection 34 in its unshift position and will remain in this position until the subsequent selection of the shift stop member 19a together with the shift disc lock stop member 19c. The selection of these two stop members unlocks the shift disc and moves it to its shift position, as hereinbefore set forth. With the above arrangement, it is obvious that the shift disc is positively locked in either one of its two shift positions and will remain in position until the receipt of an opposite shift signal or the receipt of other special signals, as hereinafter described. Also, with the positive lock for the shift disc it may be arranged to be easily movable from one position to the other without imposing an appreciable load upon the stop members employed to shift the same.

When upper case or figures characters occur in telegraph messages, they usually occur, as hereinbefore stated, in groups of small numbers interposed into the letter or lower case characters. Following the transmission of a group of figures or letters characters, a letter space character is almost invariably transmitted in order to effect a letter space operation, and then in order to resume the transmission of the letter or lower case characters an unshift signal has to be transmitted to properly condition the receiving printer to record the letter characters. In some types of telegraph circuits the groups of figures occur rather frequently, and on the transmission of an unshift character following each group of figures characters, a considerable amount of line time may be consumed, and as there is no recording operation during the transmission of the unshift signal, this line time is wasted. In accordance with another feature of the present invention, the shift disc 23 is automatically returned to its unshift position on the transmission of a word space character following a group of figures or upper case characters.

The word space stop member 19d, Fig. 3, is selected on the receipt of a word space signal, and the corresponding position on the typewheel is blank so that, on the selection of this stop member, no recording upon the recording blank is effected. Secured to the word space stop member 19d by means such as spot welding is a bracket member 46 which, as shown in Fig. 3, has at the upper end thereof a rightwardly extending projection 47 which extends over and above a projection 48 on the shift lever 24. The lower end of the bracket member 46 is in operative relation with the left hand arm 49 of a bell crank 51 pivotally mounted adjacent its center on a shoulder screw 52 supported in the mounting plate 39. The right hand arm 53 of the bell crank 51 is in

operative relation with the upper arm of the lock lever 37, as shown in Figs. 1 and 2.

On the selection of the word space stop member 19d, the bracket member 46 secured thereto causes the bell crank 51 to pivot in a counterclockwise direction and during such pivoting the arm 53 engaging the lock lever 37 pivots the same to remove the projection 36 from operative relation with the projection 34 on the lock plate 32. Thus, the shift disc 23 is unlocked, and the unlocking thereof occurs during the first part of the movement or selection of the word space stop member 19d. During the latter part of the inward movement of the stop member 19d, the angle projection 47 of the bracket member 46 engages the projection 48 of the shift lever 27 to pivot the same in a counterclockwise direction to shift the shift disc from its shift position to its unshift position, provided the same is in its shift position on the receipt of the word space signal. Thus, the selection of the word space stop member 19d effects unlocking of the shift disc 23 and the shifting thereof from its shift to its unshift position. The selection of the stop member 19d with the shift disc 23 in its unshift position unlocks the shift disc, but with the disc in its unshift position the shift lever 24 is so positioned that there is no engagement between the section 47 of the bracket member and the projection 48 on the shift lever 24. On the following selection the word space stop member 19d will be cammed back into its normal position, whereupon the lock lever returns to its normal position and locks the shift disc in the manner hereinbefore described.

Thus, the selection of a word space signal with the shift disc in its shift position unlocks the shift disc and moves the same back into its unshift position simultaneously with the word spacing of the recording medium in the associated recording mechanism, and it is unnecessary to transmit an unshift signal to return the shift disc to its unshift position.

It is obvious, of course, that various 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 typewheel shaft stop unit including a set of differently notched code discs selectively positionable into either one or the other of two positions, a set of selectable members associated with and selected by entering rows of aligned notches in said discs, a shift disc movable from one into the other of two positions, locking means for said shift disc, said means normally locking said disc in either one or the other of its two positions and means controlled by the selection of predetermined of said selectable members for operating said shift disc locking means to unlock said shift disc and for shifting the same from either one of its positions to the other.

2. In a typewheel shaft stop unit including a set of differently notched code discs selectively positionable into either one or the other of two positions, a set of selectable members associated with and selected by entering rows of aligned notches in said discs, a shift disc movable from one to the other of two positions, locking means for said shift disc, said means normally locking said disc in either one or the other of its two positions and means operative on the movement of predetermined of said selectable members to

selected positions to operate said shift disc locking means to unlock said shift disc and to then move said shift disc from either one of its two positions to the other.

3. In a typewheel shaft stop unit including a set of differently notched code discs selectively positionable into either one or the other of two positions, a set of selectable members associated with and selected by entering rows of aligned notches in said discs, a shift disc, locking means for said shift disc, said means normally locking said disc in either one or the other of its two positions, means operative on the movement of predetermined of said selectable members to selected positions to operate said shift disc locking means to unlock said shift disc and to then move said shift disc from either one of its two positions to the other and means operative on the movement of said predetermined selectable member from selected to normal positions to restore said shift disc locking means to normal to lock said shift disc in the position to which the same may be moved by the selection of said predetermined selectable members.

4. In a typewheel shaft stop unit of the type described including a set of notched code discs selectively positionable in accordance with received signal code groups into one or the other of two positions, a set of selectable members associated with said discs and selectable by entering rows of aligned notches therein, said members being divided into two groups with a member from each group being selectable for predetermined settings of said code discs, a shift disc movable from one to the other of two positions, said shift disc by its position permitting the selection of members in one of said groups while preventing the selection of members in the other group, a lock lever for locking said shift disc in either one of its two positions, a first and a second predetermined selectable member for shifting said shift disc on the selection thereof, and a third predetermined selectable member for operating said lock lever to unlock said shift disc to permit movement by said first or second selectable member, said third selectable member being selected simultaneously with the selection of either said first or second selectable members.

5. In a typewheel shaft stop unit of the type described including a set of notched code discs selectively positionable in accordance with received code groups into one or the other of two positions, a set of selectable members associated with said discs and selectable by entering rows of aligned notches therein, said members being divided into two groups with a member from each group being selectable for predetermined settings of said code discs, a shift disc movable from one to the other of two positions, said shift disc by its position permitting the selection of members in one of said groups while preventing the selection of members in the other group, a lock lever for locking said shift disc in either one of its two positions, means operative on the selection of a predetermined selectable member with said shift disc in a predetermined one of said two positions to operate said lock lever, and means operative on the selection of said predetermined selectable member with said shift disc in the other one of said two positions to operate said lock lever to unlock said shift disc and to move the same into the predetermined one of said two positions.

6. In a typewheel shaft stop unit of the type described including a set of notched code discs

selectively positionable in accordance with received code groups into one or the other of two positions, a set of selectable members associated with said discs and selectable by entering rows of aligned notches therein, said members being divided into shift and unshift groups, a shift disc having a shift and an unshift position, said shift disc permitting selection of one of said groups of selectable members at a time in accordance with the position thereof, means for locking said shift disc in either of its two positions, a shift selectable member and an unshift selectable member selectable in response to respective signal groups, means controlled by said shift and unshift selectable members to shift said shift disc in accordance with the selection thereof, and means for disabling said locking means on the selection of said shift and unshift selectable members to permit the same to shift said shift disc.

7. In a typewheel shaft stop unit of the type described including a set of notched code discs selectively positionable in accordance with received signal code groups into one or the other of two positions, a set of selectable members associated with said discs and selectable by entering rows of aligned notches therein, said members being divided into shift and unshift groups, a shift disc having a shift and an unshift position, said shift disc permitting selection of one of said groups of selectable members at a time in accordance with the position thereof, means for locking said shift disc in either of its two posi-

tions, a shift selectable member and an unshift selectable member selectable in response to respective signal groups, means controlled by said shift and unshift selectable members to shift said shift disc in accordance with the selection thereof, a selectable member for controlling said locking means, said member being selected simultaneously with the selection of either said shift or unshift selectable member to unlock said shift disc to permit shifting thereof by said shift or unshift selectable members.

8. In a typewheel shaft stop unit of the type described including a set of notched code discs selectively positionable in accordance with received signal code groups into one or the other of two positions, a set of selectable members associated with said discs and selectable by entering rows of aligned notches therein, said members being divided into shift and unshift groups, a shift disc having a shift and an unshift position, said shift disc controlling by its position the selection of selectable members from either one or the other of said groups, a shift and an unshift selectable member, means controlled by the selection of said members to shift said shift disc into corresponding positions, a third selectable member selectable with said shift disc in either position, and means operative by the selection of said third selectable member with said shift disc in a predetermined one of said positions to shift the same to its other position.

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