

[54] MULTIPLE PITCH MARGIN STOP DEVICE

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[30] Foreign Application Priority Data

Nov. 16, 1971 Germany..... 2156772

[52] U.S. Cl..... 197/63, 197/63, 197/70

[51] Int. Cl..... B41j 21/02

[58] Field of Search 197/63, 70, 82, 84 R, 84 A, 197/84 B, 176, 179, 187

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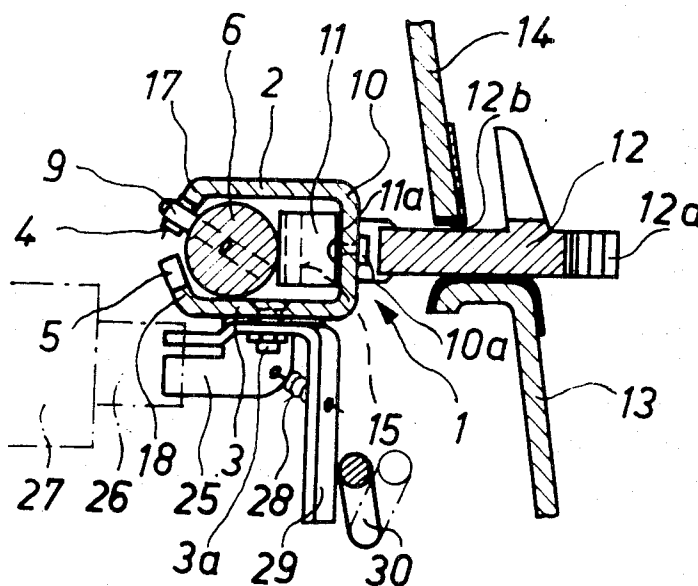
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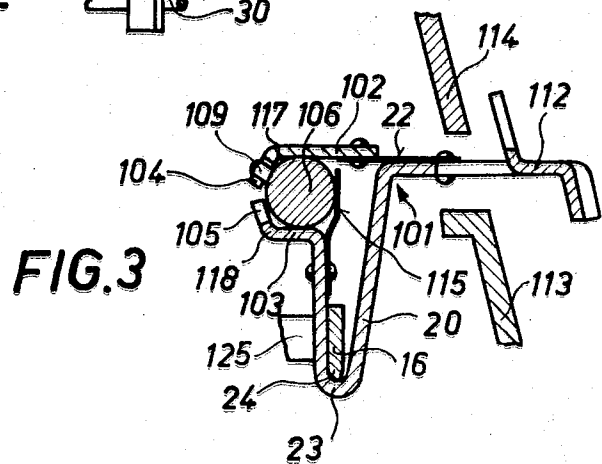
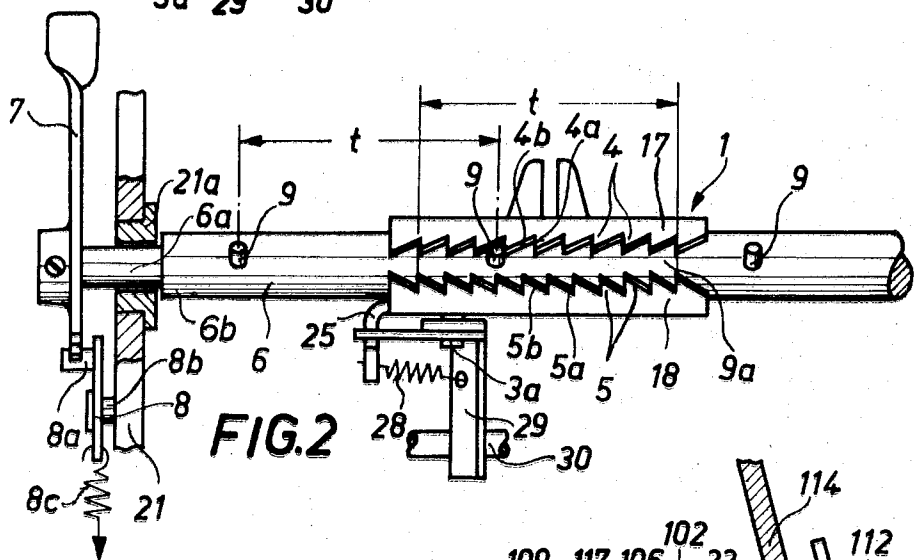
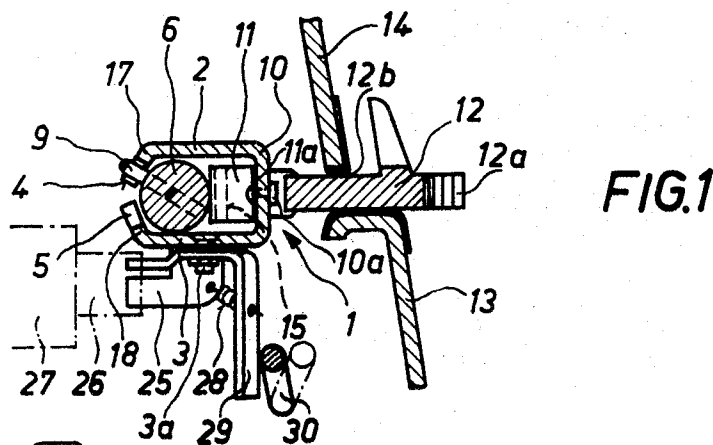
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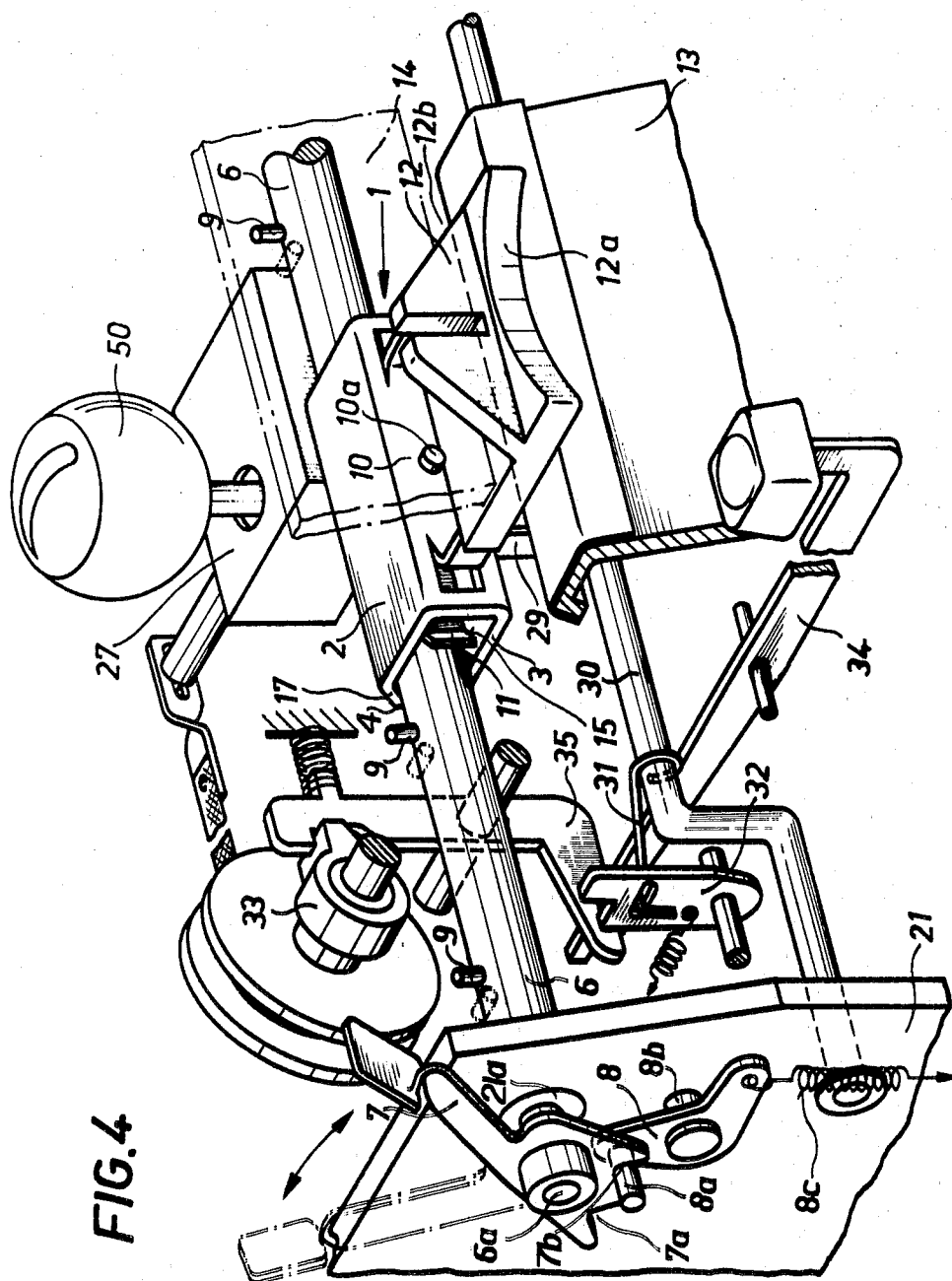
ABSTRACT

A margin stop device for a typewriter with exchangeable type heads having types of different widths, and requiring carriage steps of different length. A stop rail has a row of stops and is mounted so as to be movable between two operative positions in which one stop engages one or the other of two rack portions of a margin stop on the stop rail. The rack portions have recesses of different pitches, corresponding to the different carriage steps, and the rack portions are long enough to include pairs of first and second registering recesses. The length of the rack portions is at least equal to the distance between the stops on the stop bar so that at least one stop is located in the first or second recesses when the stop rail is in one of the operative positions. The stop rail with the margin stop in an operative position, is blocked against longitudinal movement for stopping the typewriter carriage in a position corresponding to the length of the carriage steps for that operative position. In each operative position, the respective rack portion can be manually operated to release the engaging stop so that the margin stop can be longitudinally adjusted and then again placed in the respective operative position.

10 Claims, 4 Drawing Figures







MULTIPLE PITCH MARGIN STOP DEVICE

BACKGROUND OF THE INVENTION

The present invention relates to a margin stop device for typewriters, and similar office machines, which are provided with exchangeable type heads whose different types require different carriage steps. Typewriters of this kind are provided with escapement mechanisms which are shiftable to cause carriage steps of different lengths.

The U.S. Pat. No. 3,547,245 discloses a typewriter with a flat rail provided with a guide groove for the margin stop which consists of a greater number of parts so that its manufacture is comparatively expensive. Furthermore, the required cooperation between the parts requires the highest precision in the manufacturing of the parts.

Another margin stop device of the above explained type has a stop rail on which a substantially circular rack is mounted, which is provided with two different gears. The device has the disadvantage that the required gears can be manufactured only by an expensive milling operation. The device consists of very small parts which are difficult to machine and are therefore expensive to manufacture.

SUMMARY OF THE INVENTION

It is one object of the present invention to overcome the disadvantages of known margin stop devices which cooperate with a typewriter carriage selectively moving in steps of different lengths.

A related object of the invention is to provide a margin stop device for a typewriter carriage movable in steps of different lengths, which is of simple construction, and can be manufactured at low cost.

With these objects in view, an embodiment of the present invention which is used with a typewriter carriage movable in first and second steps having first and second different lengths, comprises a stop rail having a longitudinal row of stops spaced from each other a predetermined distance related to the first and second steps; supporting means supporting the stop rail non-movably in the longitudinal direction, and for rotational movement between first and second operative positions; manual means for moving the stop rail between the first and second operative positions; and a margin stop movably mounted on the stop rail for cooperation with the typewriter carriage.

The margin stop includes first and second rack portions with first and second recesses having first and second different lengths. The first and second rack portions are of such a length that the first and second recesses include two pairs of registering first and second recesses.

The length of the rack portions is at least equal to the predetermined distance between the stops on the stop rail, whereby at least one of the stops is located in the first or second recesses when the stop rail is in the first or second operative positions.

In this manner, the margin stop is blocked against longitudinal movement in any manually selected operative position of the stop rail for stopping the typewriter carriage in a position corresponding to the length of the steps the typewriter carriage is moving.

In accordance with the invention, the margin stop is mounted on the stop rail for movement transverse to

the stop rail to an adjusting position in which the respective rack portion is displaced relative to the respective stop to release the respective stop. In this manner, the margin stop in the adjusting position, can be longitudinally adjusted along the stop rail and then again placed in a working position in which a recess of one of the rack portions engages one of the stops. The margin stop is manually displaced to the adjusting position, and returned by a spring to the working position.

The arrangement of the invention has the advantage that the different recesses of the two rack portions can be simultaneously stamped during the manufacture of the margin stop.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a sectional view illustrating an embodiment of the invention;

FIG. 2 is a front view, partially in section, illustrating the embodiment of FIG. 1;

FIG. 3 is a cross section illustrating a modified embodiment of the invention; and

FIG. 4 is a fragmentary perspective view illustrating parts of a typewriter provided with the embodiment of the invention shown in FIGS. 1 and 2.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring first to FIGS. 1, 2 and 4, the margin stop 1 has a substantially U-shaped body including a yoke portion 10 and two legs 2 and 3 ending in bent rack portions 17 and 18 provided with recesses and teeth 4 and 5, respectively. The distances between adjacent teeth and recesses 4, and adjacent teeth and recesses 5 are different, corresponding to the steps of different lengths which the typewriter carriage 27, see FIG. 4, performs in the typewriter with which the present invention is concerned.

As best seen in FIG. 2, at each end of the pair of rack portions 17 and 18, a pair of recesses and teeth 4 and 5 registers, spaced from each other a distance t . In the illustrated example, the rack portion 17 has ten recesses and teeth 4, and the rack portion 18 has eleven recesses and teeth 5 within the distance t .

A stop rail 6 is mounted on a machine wall 21 by means of a bearing 21a so as to be non-movable in longitudinal direction, but turnable together with the manual lever 7 which is secured to a journal portion 6a of the stop rail 6. As best seen in FIG. 4, the manual lever 7 has two recesses 7a and 7b cooperating with a catch pin 8a on an angular lever 8 which is mounted on a pivot 8b for angular movement, and biased by spring 8c to move the catch pin 8a into engagement with one of the recesses 7a or 7b. Manual lever 7 is shiftable between the position shown in solid lines in FIG. 4 to the position shown in chain lines, and arrested in either position, together with the stop rail 6.

The stops 9 are stop pins secured in a longitudinal row to the stop rail 6, and spaced equal distances t so that at least one stop 9 is either in engagement with a

face 4a or with a face 5a. Faces 4a and 5a of recesses 4 and 5, respectively, are substantially perpendicular to the longitudinal direction of the stop rail 6, while the corresponding faces 4b and 5b are slanted. Consequently, when the stop rail 6 is turned from the operative position shown in FIG. 2 to the other operative position by operation of manual lever 7, and when the stop 9 between the rack portions 17 and 18 engages a slanted face 5b, the margin stop 1 is shifted slightly along the stop rail 6 until the respective stop 9 abuts a face 4a or 5a.

Assuming that the rack portion 17 has ten recesses and teeth 4 per inch, and the rack portion 18 has eleven teeth and recesses 5 per inch, the end perpendicular faces 4a and 5a register, and the first and last pairs of recesses and teeth 4 and 5 register, spaced a distance t which is at least equal to the distance t between the stops 9 to assure an engagement of one of the stops 9 with one or the other of rack portions 17 and 18 when the stop rail 6 is turned by manual lever 7 between the two operative positions.

It is possible to make the rack portions 17 and 18 long enough so that another pair of recesses and teeth 4 and 5 registers, for example 2 inches, in which event the stops 9 can be spaced 2 inches, or two t . If in such an arrangement the stops 9 are spaced only 1 inch two stops 9 simultaneously engage two recesses and teeth 4 or 5. As best seen in FIGS. 1 and 4, the central portion 11a of a leaf spring 11 is secured by a rivet 10a to the yoke 10, while the ends of leaf spring 11 abut the stop rail 6. A handle 12 with a finger engaging portion 12a is fixedly secured to yoke 10, and is guided in a slot 12b between two housing walls 13, 14 which permits longitudinal and transverse movements of handle 12.

Spring 11 urges the U-shaped body 2, 3, 10 to the right as viewed in FIG. 1, so that the bent over rack portions 17 and 18 abut the stop rail 6 in the normal position of the device in which a stop 9 is located in one of the recesses and teeth 4, 5 of rack portions 17 or 18, FIG. 1 showing a condition in which a stop 9 is located in a recess 4 of rack portion 17.

As explained above, by turning stop rail 6 with stops 9, the device can be shifted to the other operative position in which a stop 9 is located in recess and tooth 5 of rack portion 18.

Assuming that the typewriter has been provided with a specific type head 50 whose types have a width corresponding to the spacing of the recesses and teeth 4, stop 9 is located in a recess and tooth 4, as shown in FIG. 1. If it is desired to set the margin stop 1 differently while retaining the spacing provided by a stop 9 in a recess and tooth 4, the handle 12 is pushed in so that the leaf spring 11 is flattened, while the rack portions 17 and 18 move away from the surface of stop rail 6 and finally release the stop pin 9 in a position, not shown in the drawing, permitting the longitudinal sliding of the margin stop 1 together with handle 12 along the stop rail 6 until the margin stop 1 is in a newly selected position, whereupon the handle 12 is released by the operating person, permitting spring 11 to return the U-shaped body 2, 3, 10 to the normal position shown in FIG. 1 in which a stop 9 is located again in a recess and tooth 4 of rack portion 17. Spring 11 holds the rack portions 17 and 18 in this position abutting the stop rail 6. As best seen in FIG. 4, the end portions 15 of leaf spring 11 are bent over and abut the stop rail 6.

Assuming that the type head 50 of the typewriter, see FIG. 4, has a set of types whose width requires ten carriage steps per inch, corresponding to the rack portion 17, the manual lever 7 is placed in the solid line position so that the stop 9 is located in the rack portion 17 engaging one of the recesses and teeth 4, as shown in FIG. 1. If it is now desired to place the margin stop 1 in another position, the operator presses against the finger engaging portion 12a of the handle 12 so that the margin stop 1 is displaced to the left while the arms of spring 11 are flattened until the ends 15 abut the inner surface of the yoke 10. The movement of the margin stop 1 places the rack portions 17 and 18 in a position in which the rack portion 17 is located radially outward of the end of stop 9, so that the operator can now move the handle 12 in the guide slot 12b between the housing wall 13 and cover wall 14 parallel to the stop rail 6 so that the U-shaped body 10, 3, 2 is displaced relative to the stops 9 until the margin stop 1 is in a new desired position. The operator releases the handle 12, and spring 11, 15 returns the U-shaped member 10, 3, 2 to its initial position so that one of the recesses and teeth 4 receives the respective stop 9 which is located in the gap 9a. This may be the same stop 9, as before, or another stop 9. Due to the fact that the rack portions 17, 18 are at least as long as the distance between adjacent stops 9, one of the stops 9 must always be located in the gap 9a for engaging a recess and tooth 4.

In the event that the type head 50 is exchanged for another type head 50 having types of a different width requiring eleven carriage steps per inch, the manual lever 7 is shifted to the broken line position (see FIG. 4) so that the stop 9, which is in the gap 9a is turned to a position first engaging a slanted face 5b of one of the recesses and teeth 5, and then sliding into engagement with the perpendicular face 5a of a recess and tooth 5, while the margin stop 1 is slightly displaced in longitudinal direction of the stop rail 6.

FIG. 1 shows schematically in chain lines the carriage 27 on which the type head 50 is mounted, provided with a stop projection 26. The leg 3 of the U-shaped body 2, 3, 10 carries a fixed stop arm 25 which is located in the path of movement of the stop projection 26 on the carriage 27. Consequently, carriage 27 is stopped by engagement of stop projection 26 with the stop arm 25 which was previously set, together with the entire margin stop 1, to a desired position on the stop rail 6. The axial force transmitted from the carriage 27 and stop projection 28 to the stop arm 25 is further transmitted to the U-shaped body 2, 3, 10, and from rack portion 17 to a stop 9 and to the stop rail 6, which cannot move in axial direction due to the provision of the bearing 21 and the corresponding shoulder 6b.

A pivot 3a is mounted on the leg 3, and supports an angular lever 29 for turning movement about pivot 3a. A spring 28 connects the angular lever 29 with the stop arm 25 so that angular lever 29 is biased to a position engaging a bail 30, best seen in FIG. 4. Bail 30 is connected by a link 31 with a latch 32 which has two positions for locking or releasing a clutch control lever 35 which controls the carriage return clutch 33, and can be operated by a carriage return key 34.

When carriage return key 34 is operated, the clutch control lever 35 is turned in clockwise direction so that the carriage return clutch 33 is engaged and causes movement of the type head carriage 27 to the left as viewed in FIG. 4. The clutch control lever 35 is held by

latch 32 out of engagement with the carriage return clutch 33 until the type head carriage 27 abuts with the stop projection 26 against the angular lever 29, and operates by lever 29 the bail 30 which pulls through link 31 the latch 32 out of the position locking the clutch control lever 35, so that clutch control lever 35 disconnects the carriage return clutch 33. In the meantime, the stop projection 26 of the type head carriage 27 has run against the fixed stop arm 25 of the margin stop 1, so that the carriage return movement is completed.

Since the recesses and teeth 4 and 5 have sawtooth shape, and abut with the perpendicular faces 4a and 5a on the stops 9 of the stop rail 6, which is non-movable in axial direction, a reliable mounting of the margin stop 1 is assured.

In the embodiment of FIG. 1, the walls 13 and 14 of the supporting means of the machine are used for guiding the margin stop 1 in longitudinal direction of the stop rail 6. In the event that the walls 13 and 14 cannot be used for guiding the handle 12 of the margin stop 1, an additional guide bar 16 is provided, and the margin stop 101, shown in FIG. 3, is used. The supporting walls 114 and 113 are shown in FIG. 3 to be spaced so that they cannot be used for slidably guiding the handle portion 112. The margin stop 101 is provided with an angular V-shaped guide portion 20, in which the guide bar 16 is located in a position parallel to the stop rail 106. The free leg 102 of margin stop 1, which carries the rack portion 117 with the teeth and recesses 104, is secured by a leaf spring 22 to the handle portion 112 of margin stop 101. Leaf spring 22 biases the margin stop 101 upward so that the lower edge 23 of the V-shaped guide portion 20 abuts with lower edge 23 on the lower edge 24 of guide bar 16 so that the margin stop 101 is reliably guided on the guide bar 16 and on the stop rail 106 between the free leg 102 and a leg 103, which carries a rack portion 118.

When the margin stop 101 is to be adjusted in longitudinal direction on the stop rail 106, manual pressure is exerted on the handle portion 112 so that margin stop 101 turns in counterclockwise direction about the lower edge 24 of the guide bar 16 against the action of spring 115 so that the rack portions 117 and 118, and more particularly the recesses and teeth 104, 105 move to a position spaced from the surface of stop rail 106 a distance greater than the radial length of the stops 109, so that stops 109, and thereby the entire margin stop 101 is released for free movement in longitudinal direction of the stop rail 106 to a new adjusted position. When the margin stop 101 has been placed in a desired position for stopping the carriage 27, the handle portion 112 is released by the operator, and spring 115 returns the margin stop 101 to its normal position in which a recess and tooth 104 of rack portion 117 engages one of the stops 109, as shown in FIG. 3. Manual means corresponding to the manual means 7, 8, not shown in FIG. 3, are provided for turning stop rail 106 with stops 109 to a position in which one stop 109 is located in one of the recesses and teeth 105. The fixed stop arm 125 cooperates with the stop projection 26 of carriage 27 as described with reference to FIGS. 1, 2 and 4.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of margin stop devices differing from the types described above.

While the invention has been illustrated and described as embodied in a margin stop device for use with a typewriter carriage movable in first and second steps having first and second different lengths, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be protected by Letters Patent is set forth in the appended claims.

I claim:

1. For use with a typewriter carriage movable in first and second steps having first and second different lengths, a margin stop device comprising, a stop rail having a longitudinal row of stops spaced from each other a predetermined distance related to said first and second steps; supporting means supporting said stop rail nonmovably in the longitudinal direction thereof, and for rotational movement between first and second operative positions; manual means for moving said stop rail between said first and second operative positions; and a margin stop movably mounted on said stop rail for cooperation with said typewriter carriage, and including first and second rack portions with first and second recesses having said first and second different lengths, said first and second rack portions forming a longitudinal gap and having such a length that said first and second recesses include two pairs of registering first and second recesses, said length of said rack portions being at least equal to said predetermined distance whereby at least one of said stops is located in said first and second recesses, respectively, when said stop rail is located in said first and second operative positions, respectively, so that said margin stop is blocked against longitudinal movement in any manually selected operative position of said stop rail for stopping the typewriter carriage in a position corresponding to the length of the steps the typewriter carriage is moving.

2. A margin stop device as claimed in claim 1 wherein said stop rail is cylindrical for supporting said margin stop during turning movement between said first and second operative positions.

3. A margin stop device as claimed in claim 2 wherein said stops are radial stop pins secured to said cylindrical stop rail.

4. A margin stop device as claimed in claim 3 wherein each of said first and second recesses has a stop face perpendicular to said stop rail, and a slanted face cooperating with said stop pins so that during movement of said stop rail to one of said first and second operative positions, said margin stop is longitudinally shifted by a stop pin engaging the respective slanted face until said stop pin abuts said stop face.

5. A margin stop device as claimed in claim 1 and mounting means mounting said margin stop on said stop rail for movement transverse to said stop rail in any one of said first and second operative positions to

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an adjusting position in which the respective rack portion is displaced relative to the respective stop to release the respective stop so that said margin stop in said adjusting position can be longitudinally adjusted along said stop rail and then again placed in a working position in which a recess of the respective rack portion engages one of said stops.

6. A margin stop device as claimed in claim 5 wherein said margin stop includes a guide portion; and wherein said supporting means guide said guide portion in longitudinal and transverse directions.

7. A margin stop device as claimed in claim 6 wherein said supporting means include wall means forming a guide slot; and wherein said guide portion is a handle guided in said guide slot for moving said margin stop to said adjusting position.

8. A margin stop device as claimed in claim 5 wherein said margin stop includes a V-shaped guide portion; and wherein said supporting means include a

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guide bar parallel to said stop rail and located in said V-shaped guide portion for longitudinal and transverse movements.

9. A margin stop device as claimed in claim 5 wherein said margin stop includes a spring abutting said stop rail for urging said margin stop out of said adjusting position and to the respective working position.

10. A margin stop device as claimed in claim 9 wherein said margin stop includes a U-shaped body having a yoke, and legs located on opposite sides of said stop rail and ending in said rack positions, said spring being mounted between said yoke and said stop rail; and wherein said margin stop includes a handle secured to said yoke so that said margin stop can be manually moved to said adjusting position against the action of said spring, and is returned by said spring to the respective working position upon release of said handle.

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