Dec. 1, 1942. J. S. EDISON 2,303,686

TYPEWRITER MARGIN JUSTIFIER

Filed April 29, 1940 3 Sheets-Sheet 1

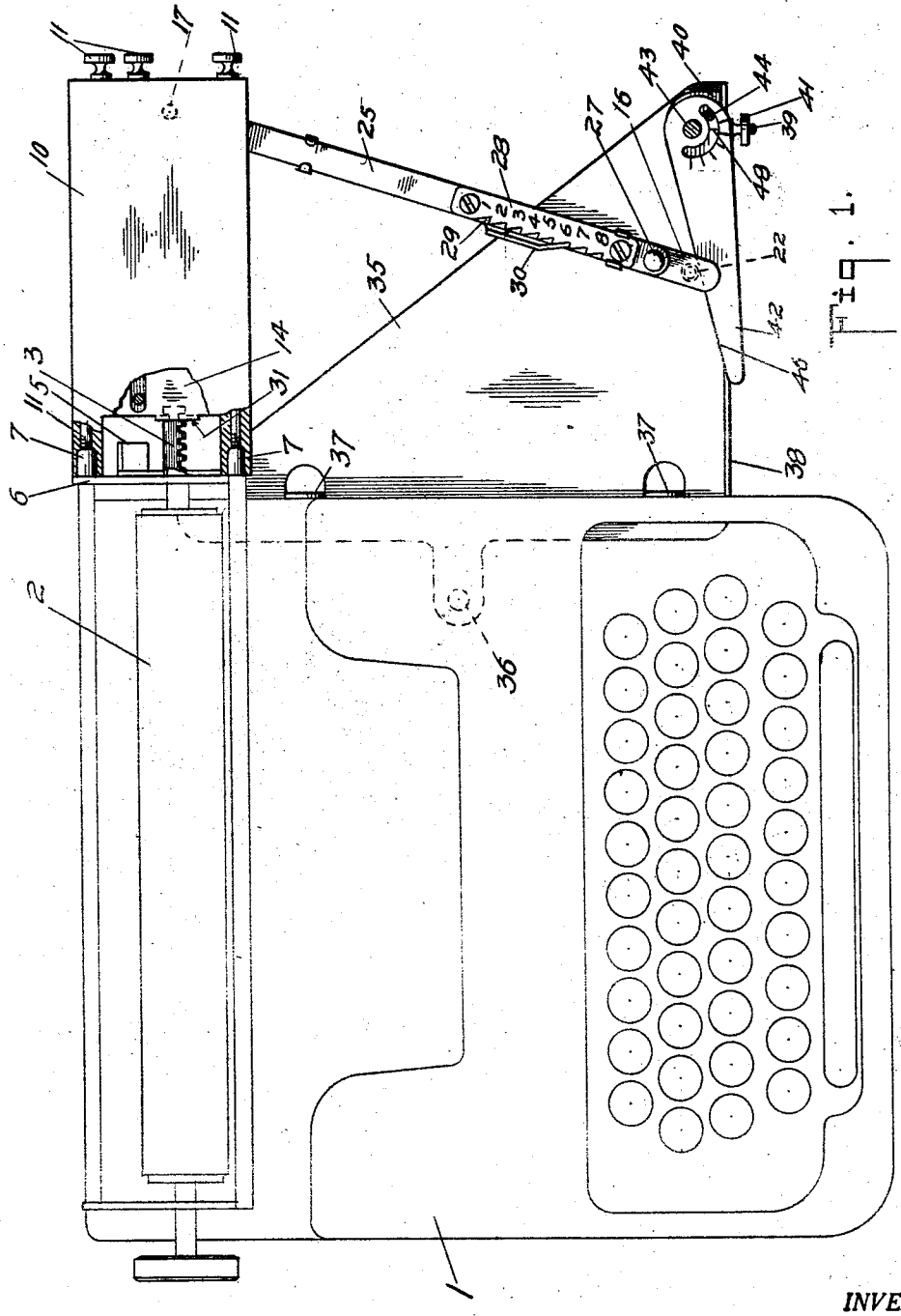


FIG. 1.

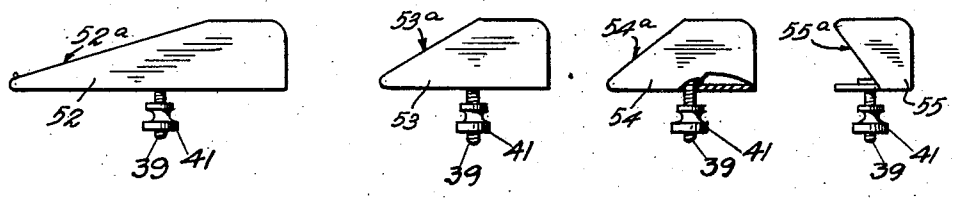
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Filed April 29, 1940 3 Sheets-Sheet 2

Fig. 7.



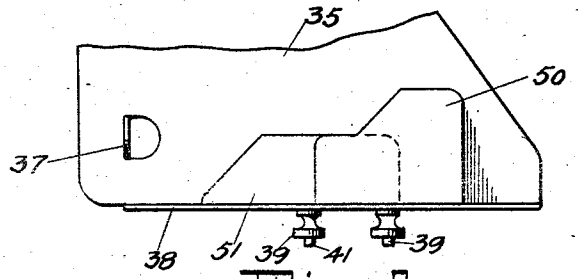


Fig. 6.

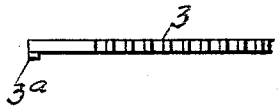


Fig. 5.

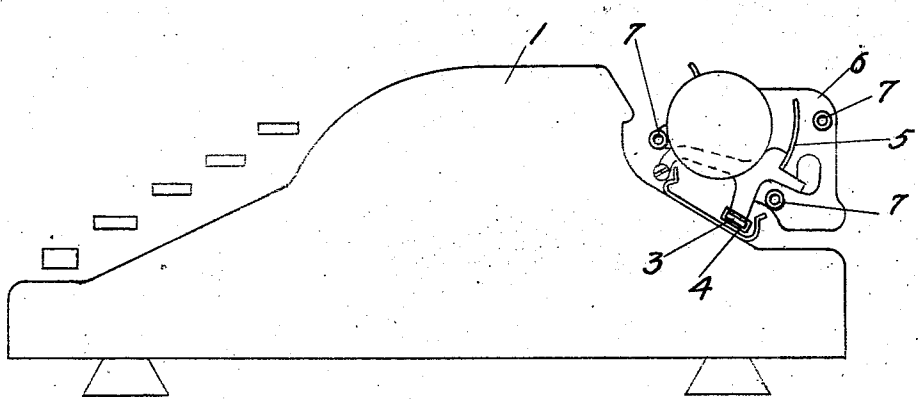


Fig. 2.

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Dec. 1, 1942. J. S. EDISON 2,303,686

TYPEWRITER MARGIN JUSTIFIER

Filed April 29, 1940 3 Sheets-Sheet 3

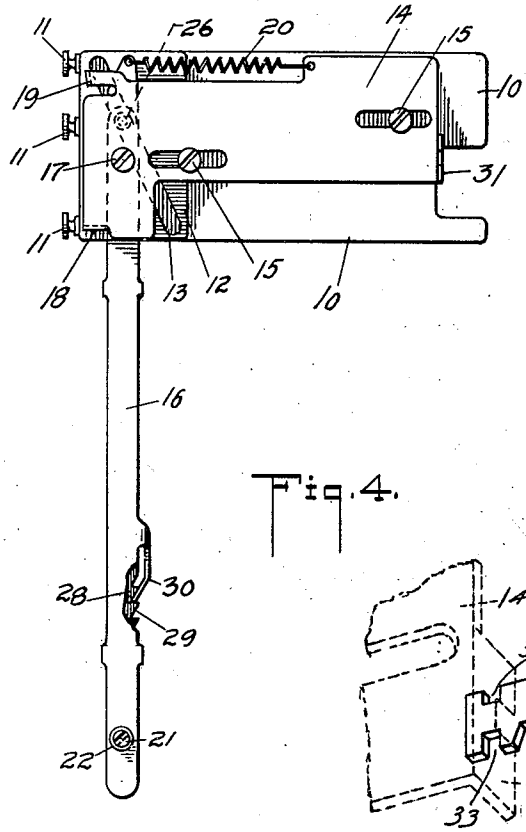


Fig. 4.

Fig. 9.

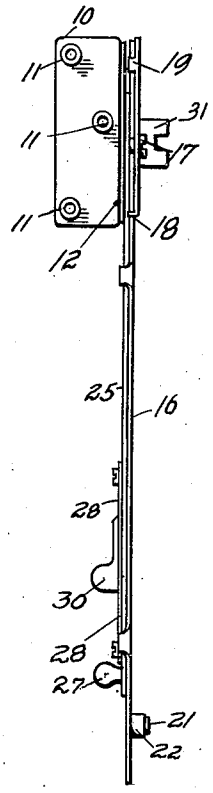


Fig. 5.

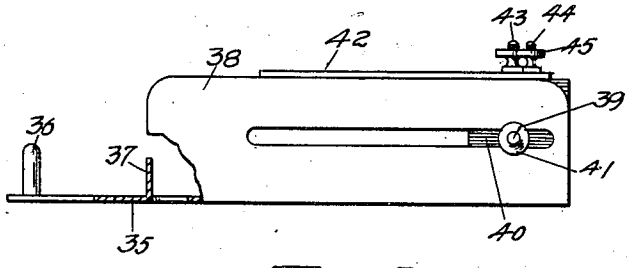


Fig. 6.

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UNITED STATES PATENT OFFICE

2,303,686

TYPEWRITER MARGIN JUSTIFIER

John S. Edison, Burbank, Calif.

Application April 29, 1940, Serial No. 332,129

13 Claims. (Cl. 197—84)

The present invention relates to typewriting machines and more particularly to devices for justifying the right margin of matter typed on such machine.

Various devices for justifying the right margin of typewritten matter have reached the open market, and such devices as have come to my notice are complicated and require changes in typewriter construction so radical that special models have to be manufactured solely for the purpose of margin justification. It has also been observed that the use of such commercially known devices has been complicated either through the necessity of performing various operations as a preliminary to the justifying of each line to be typed, or resort to mental calculations in order to prepare for each line justification. In fact, both mental and manual steps of various kinds are needed correctly to use such devices. Furthermore, the capacity of such devices is limited to marginal variations of about five spaces.

In view of the foregoing, it is the general object of the invention to provide a simple and inexpensive device with which line after line may be justified by means of a single, convenient and self-evident adjustment.

It is a further object to provide a device which may be embodied into any commercially well known typewriter or other key operated typing machine without materially affecting or changing any part thereof to the end that typewriters may be so equipped without the necessity of providing special models for this purpose.

Another object is the provision of a simple and inexpensive justifying device which may be adapted for easy attachment to any well known model of typewriter, or to other key operated typing machines.

These and other objects of the invention, together with the many advantageous features thereof, will be readily apprehended upon perusal of the following description, and drawings are hereto annexed in which one preferred form of the invention is illustrated.

In the drawings:

Fig. 1 is a general plan, showing a well known typewriter lightly outlined and the devices of the invention in heavy lines, in their relation to such typewriter;

Fig. 2 is a substantially corresponding end elevation of the typewriter, in which parts of particular importance to the invention are more boldly outlined;

Fig. 3 shows one end of the escapement rack of the typewriter;

Fig. 4 is an inverted plan view of the more important parts of the invention;

Fig. 5 is an end elevation of the structure of Fig. 4;

Fig. 6 is a front elevation of a part of the device as shown in Fig. 1;

Fig. 7 illustrates various types of cams which may conveniently be employed in connection with the device;

Fig. 8 shows a different form of cam combination which is found convenient in connection with certain kinds of typing; and

Fig. 9 is a perspective detail view, on a large scale, showing the method of connecting the escapement rack of the typewriter to the device of the invention.

The device of the invention is, in Figs. 1 and 2, shown attached to a portable typewriter, 1, of the "Corona" type, the general contour of which is shown in light lines. Only the parts of the carriage of this machine which must be shown in order clearly to describe and explain the operation of the invention, are illustrated in light outline and identified by the reference numeral 2.

This machine, in common with most typewriters, is provided with an escapement wheel (not shown) normally riding in a rack 3. For the purposes of the invention, it is necessary to mount this rack for longitudinal movement in guides 4. The rack, in this particular Corona model, is fastened to release levers 5, and it becomes necessary to detach the rack and to mount the guides 4 on these levers in place thereof in the manner that the rack originally was mounted thereon. The rack is then pushed into these guides from the left side of the machine until stopped by a suitable pin or shoulder 3a, on the left end of the rack. (See Fig. 3.) The main spring of the typewriter (not shown), urging the carriage toward the left, will maintain the shoulder of the rack pressed against the left guide 4 while the escapement wheel is in engagement with the rack, as will be readily seen by all versed in the art.

The right carriage end 6 is manufactured with several perforations for seating screws to maintain the framework of the carriage assembled. Three of these screws are, in the present disclosure, removed and replaced by special studs 7. This completes the preparations necessary in order to attach and operate the device of the invention.

An extension bracket 10 is shaped to fit against the outer surface of the carriage end 6, and screws 11 extend through this bracket to engage

threaded sockets of the studs 7. When these screws are driven home, it is found that the bracket 10 becomes firmly clamped in position on the carriage, but the extension may, of course, be otherwise attached.

Turning now to Fig. 4, which, for convenience of description, shows the bracket 10 in inverted position, it is seen that a cam plate 12 is mounted on this bracket or, if the bracket is formed out of sheet metal, it may form an integral part thereof, and is made with a cam slot 13. A plate 14 is mounted on the bracket in spaced relation to the cam plate 12, and this plate has longitudinally directed slots, engaged by studs 15 of the bracket, thereby to adapt the plate for longitudinal movement on the bracket.

A lever 16 is pivotally hung at 17 for oscillatory movement on plate 14, between stops 18 and 19 of the latter. A spring 20 normally maintains this lever at rest against the stop 18. A stud 21 projects from the opposite end of the lever and this stud is preferably fitted with an antifriction roller 22.

An arm 25 is fitted to slide longitudinally in guides of the lever 16, and it is provided at its inner end with a stud 26 riding in the cam slot 13. A suitable knob 27 is provided at the outer end of the arm for the purpose of facilitating longitudinal, manual adjustment on the lever. A scale member 28 is shown attached to the arm 25, and this member is provided with a series of notches 29 for engagement by a resilient detent 30 of the lever 16. This detent will maintain the arm in any desired position of adjustment on the lever.

It is noticed that the plate 14, which hereinafter for convenience is termed the rack positioning plate, is made with a bifurcated ear 31, see also Fig. 5, and it is slotted in this fashion to receive the right end of the rack 3. It is also to be noted that this end of the rack is provided with opposed slots 32 and 33, in which the prongs of the ear 31 seat to tie the two parts firmly together.

Returning now to Fig. 1, it is seen that the combined lever 16 and arm 25 which, when combined, conveniently may be termed the justifying lever, reach over a triangular member 35, which may be termed the justifying cam bracket. This bracket is, for use with the "Corona" model, designed to rest on the table supporting the typewriter. It is made with a stud 36, which rises into a perforation found in the key lever comb of the typewriter (not shown), and ears 37 are provided on the bracket 35 which rest against the side of the typewriter frame when the latter is seated on the stud 36, thereby properly to aline the bracket with the above described parts of the device.

The front end of the bracket 35 is bent upward at 38 to form a guide for the justifying lever parallel with the movement of the typewriter carriage, and it is longitudinally slotted to receive a stud 39, projecting from a bracket 40. The latter is, for operating purposes, slidable along the flange 38 and may be clamped in position thereon by means of a suitable thumb nut 41.

A cam 42 is pivotally secured to the bracket 40, at 43, and it is made with a slot, concentric with the pivot 43, in which a stud 44 of the bracket is seated. A thumb nut 45 is added to clamp the cam on the bracket in the desired position of adjustment.

Before entering upon a description of the operation of the device, it becomes necesary to draw attention to the scale plate 28, the notches 29 of which are of a width to correspond with pica type spacing and numbered 1 to 8. When this particular scale plate is employed, it should be noted that the stud 26, of the arm 25, is axially alined with the pivot 17 of the lever 16 when the detent 30 rides in notch 4 of the scale plate. Also that, because these parts are axially alined, the justifying lever may be swung back and forth without imparting movement to the rack positioning plate 14. It is, for this reason, termed "neutral" position, because the normal typewriter spacing is not affected while the device remains in this position. It was above stated that the spring 20 maintains the justifying lever at rest against the stop 18. As a preliminary to operation of the device, this lever is swung into the position shown in Fig. 1, whereupon the carriage is moved to the right until stopped by the left margin stops.

Let it now be assumed that the right margin of a previously typewritten letter is to be justified, and that the first line of this letter is of the desired length. Also, that the second line is two letter spaces longer. The first line is typed with the device in neutral position and the carriage returned. The arm 25 is then pushed along until the detent rides in notch 2. When the typing of the second line now is effected, it is seen that the roller 22 commences to ride down along the cam surface 46, gradually to cause the justifying lever to swing toward the right, while it moves with the carriage to the left and, in swinging, to move the rack positioning plate 14 to the left. This movement continues until the roller 22 leaves the cam surface 46 and lands on the parallel flange 38, from which point on the angular position of the justifying lever remains unchanged.

Because the rack positioning plate carries the rack along in the direction of movement of the carriage while the roller travels down the cam surface, it is seen that the letter spacing is correspondingly shortened during this movement and that the end of the line will register with the end of the first line.

The third line may be three spaces short, and the justifying lever is adjusted until the detent lodges three notches on the other side of notch 4, i. e., in notch 7. If now the carriage is returned and the third line typed, it is found that its right margin will register with the margin of the first two lines. The reason is that the stud 26, while the arm was moved along the lever to the new position at the notch 7, passed over the lever pivot 17 and a distance beyond the pivot corresponding to the three notches of the scale plate. When the roller 22 of the justifying lever then travels down the cam surface, it is seen that the rack positioning plate and the rack are moved in the direction opposite to the carriage movement and that, as a result, the letter spacing is lengthened while the roller travels down the cam.

From the foregoing brief description of the operation of the device, it is seen that the typist has only one operation to perform, namely the adjustment of the scale 28. Also, that a single movement suffices to return the device to neutral position at notch 4.

Typewritten columns vary a great deal in width, and because it is desirable to spread the period of justification as much as the width of the column will allow, in order that the difference in

spacing along the line may not be noticed, it is possible to swing the justifying cam **42** on its pivot **43** until the desired length of justifying period is obtained, whereupon the cam may be clamped in position by the thumb nut **45**. The setting of this cam may be facilitated by placing thereon radial lines indicating the width of justifying period desired for various widths of columns. The radial lines on the cam of Fig. 1 may indicate column widths in inches, and these lines may be brought into registration with a line **48** of the bracket **40**.

If, on the other hand, the device is to be used for columns of fixed width, as for instance in preparing stencils for mimeographing books, booklets or forms of uniform width, it may be more advantageous to use cams of predetermined shapes, such as indicated at **52**, **53**, **54** and **55** in Fig. 7. It is noticed that the cam surfaces **52ª**, **53ª**, **54ª**, **55ª** are progressively shortened to correspond to predetermined column widths. If, for example, the cam surface **52ª** is of a length to produce a justification period of eight inches, the cam surface **53ª** may represent a period of six inches, the surface **54ª** a period of five inches, and the very abrupt cam **55ª** a period of three inches or less. It is often required to type more than one column on a sheet, in which case it may be found preferable to mount two cams on the cam bracket, substantially as indicated in Fig. 8. The cam **50** would be set for the first column and the cam **51** for the second. The two cams may be relatively adjusted to correspond with the positions that the columns are to take on the paper or, if columns of fixed width and spacing are to be produced over an extended period of time, it may be preferable to combine the two cams into a single cam.

The device of the invention, as outlined in the drawings, is designed to justify over eight spaces, which is believed to represent the longest single syllable in the English language, but I wish it understood that the device may be designed to justify more than eight spaces, if desired. If a scale plate is employed having notches corresponding in width to elite letter spacing, it would contain nine notches and so justify over nine elite letter spaces.

The angle of the slot **13** is very important. As illustrated, it is set at about twenty-five degrees and is designed to justify columns of about four inches and over. When it is desired to justify within a narrower column, it is merely required to decrease the angle of inclination of this slot. This would perhaps only be of advantage where a micro type spacing is employed.

It was above stated that the device as herein presented is designed for use on a certain portable typewriter, but I wish it understood that it may readily be adapted for use on any commercially known typewriting machine or any device provided with a key operated typing mechanism by shaping the carriage bracket **10** and the cam bracket **35** for convenient attachment to the particular machine to be served by the device. Or the device may, of course, be built into the typewriter to form a permanent part thereof.

It is the aim of this description and the accompanying drawings to present the invention in such simple and clear form that anyone versed in the art may be able to construct the device and to adapt it to the particular model of typewriter selected. And I reserve the right to embody in the device such necessary or preferable modifications as will fall within the scope of the appended claims.

I claim:

1. Margin justifying means for a typewriting machine having a carriage and escapement rack comprising, means mounting the escapement rack for longitudinal movement, a support on the machine frame, cam means on said support, means operatively connecting said rack with the said cam means to effect longitudinal movement of said rack relative to the typewriter carriage during the printing movement of the latter, said means including a justifying lever comprising two relatively longitudinally adjustable arms, and means for adjusting one arm relative to the other to select the desired amount of movement of the rack.

2. In a margin justifying device for a typewriter having its escapement rack longitudinally movable relative to its carriage, a justifying lever pivotally connected to the end of said rack nearer one end of the lever than the other, a cam slot on the carriage, a stud projecting from the end of said lever nearer its fulcrum to ride in said cam slot, a cam on the typewriter frame, and a stud projecting from the other end of the lever to ride on said cam.

3. The combination with a typewriter having its escapement rack movable relative to its carriage, a justifying lever comprising relatively longitudinally adjustable arms, one of said arms being pivotally connected to the said rack, the other arm being pivotally connected to the carriage, means controlling adjustment of one arm relative to the other, and means controlling swinging movement of the justifying lever during letter spacing movement of the carriage.

4. The combination with a typewriter frame, a carriage movable thereon and an escapement rack mounted on said carriage for longitudinal movement relative thereto, of a justifying lever comprising relatively longitudinally adjustable members, means for operatively interconnecting the members of said lever with said rack and carriage to move one relative to the other, and means for controlling swinging movement of the lever during letter spacing movement of the carriage for effecting said relative rack and carriage movement.

5. The combination with a typewriter frame, its carriage and an escapement rack on the carriage movable relative thereto, of a justifying lever comprising relatively longitudinally adjustable members, means for operatively interconnecting the members of said lever with said rack and with the carriage to move one relative to the other, means controlling relative longitudinal adjustment of said members to vary the relative rack and carriage movement, and means for controlling swinging movement of the lever during letter spacing movement of the carriage.

6. In a typewriting machine having a carriage and escapement rack in combination, a justifying mechanism operatively interconnecting said carriage and rack, a justifying lever controlling the operation of said mechanism, means on the typewriting machine controlling the operation of said lever, and means embodied in the lever movable to set the mechanism to move the rack one way variable distances to shorten the letter spacing during the letter space movement of the carriage, movable to set the mechanism to move the rack variable distances in the opposite direction to lengthen the letter spacing during the letter space movement of the carriage, and to set the

mechanism in neutral position in which movement of said lever imparts no movement to the rack relative to the carriage movement.

7. In a typewriter having a carriage and a rack thereon, a justifying mechanism operatively interconnecting said carriage and rack, a justifying lever controlling the operation of said mechanism, cam means on the typewriter positioned to control the operation of said lever, and means embodied in the lever movable to set the mechanism to move the rack one way to shorten the letter spacing during the letter space movement of the carriage, movable to set the mechanism to move the rack in the opposite direction to lengthen the letter spacing during the letter space movement of the carriage, and to set the mechanism in neutral position in which movement of said lever imparts no movement to the rack relative to the carriage movement.

8. A line justifying device for a typewriter having a carriage and escapement rack comprising, a support extending from the end of the carriage, an extension of said rack slidable on said support, a justifying lever operatively interconnecting said support and rack extension, means swinging said lever during letter spacing movement of the carriage, and means embodied in the lever movable to adjust the lever to lengthen and shorten the letter space movement of the carriage and to set the lever in neutral position where the movement of the lever imparts no movement to the rack relative to the carriage movement, and cam means on the typewriter controlling the swinging movement of the lever to determine the length of the printing line.

9. The combination with a typewriter having a movable carriage and an escapement rack mounted for lengthwise adjustment thereon, of a cam-slotted extension bracket attached to said carriage, a member mounted for longitudinal movement thereon and attached to the end of said rack, cam means on the typewriter, a lever pivoted on said member, said lever having a roller positioned to travel along said cam means during the typing movement of the carriage, an arm having a stud riding in said slot, and means operatively interconnecting said lever and arm for relative longitudinal displacement to determine the length of movement of the rack relative to the movement of the carriage.

10. In a typewriter having its escapement rack longitudinally movable on its carriage, support means extending from the carriage, said support means having a cam slot, a member supported by said means and attached to said rack, a cam supported by the typewriter frame, an arm pivoted on said member, a bar longitudinally movable on said arm and having a stud riding in said slot, a projection on the opposite end of said arm positioned to ride on said cam, said arm and bar combining to form a justifying lever, and means urging swinging movement of the said lever to cause said projection to ride on the cam during the printing movement of the carriage thereby to move the rack longitudinally relative to the carriage movement.

11. In a typewriter having its escapement rack movable in relation to its carriage, a member on the carriage having a cam slot, a part extending from said rack, a cam supported by the typewriter frame, a lever pivoted on said part, an arm mounted on and longitudinally movable on said lever and having a stud riding in said cam slot, a roller on the opposite end of said lever positioned to ride on said cam, means urging said roller against said cam to cause the lever and arm to swing on the lever pivot during the period of the printing movement of the carriage in which the roller rides on the cam, thereby to move the rack longitudinally relative to the carriage, and means for fixing the position of the arm on the lever thereby to determine the movement of the rack relative to the carriage.

12. In combination with a typewriter having a carriage and an escapement rack longitudinally movable on said carriage, extension means for the typewriter carriage having a cam slot, a member on said means attached to the typewriter escapement rack, a lever pivoted on and extending from said member, a support extending from the typewriter frame parallel with its carriage, means mounted for longitudinal adjustment on said support and having cam surfaces, an arm on said lever having a roller riding in said cam slot, a roller on the free end of said lever for successive contact with said cam surfaces thereby to swing said lever and arm during the carriage printing movement in which the roller successively rides along said cam surfaces, thereby to move said member and rack relative to the carriage.

13. In combination with a typewriter having a carriage and an escapement rack longitudinally movable on said carriage, extension means for the typewriter carriage having a cam slot, a member in said means attached to the typewriter escapement rack, a lever pivoted on and extending from said member, a support extending from the typewriter frame parallel with its carriage, means mounted for longitudinal adjustment on said support and having cam surfaces, an arm on said lever having an element riding in said cam slot, a projection on the free end of said lever for successive contact with said cam surfaces, means urging said projection against said surfaces thereby successively to swing said lever and arm during the period of the carriage printing movement, thereby to move said rack relative to the carriage, and means relatively adjusting said lever and arm longitudinally to vary the movement of the rack.

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