Oct. 8, 1940. R. D. DODGE 2,217,160

TYPEWRITING MACHINE

Filed Dec. 17, 1938

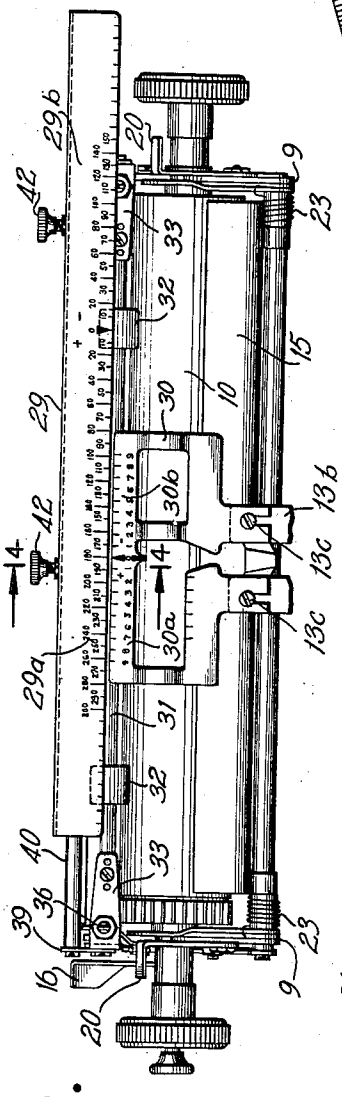


FIG. 1.

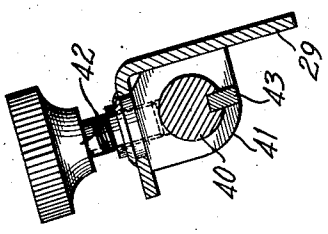


FIG. 4.

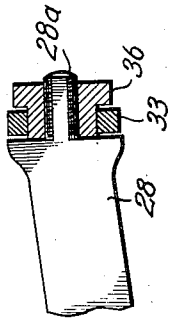


FIG. 5.

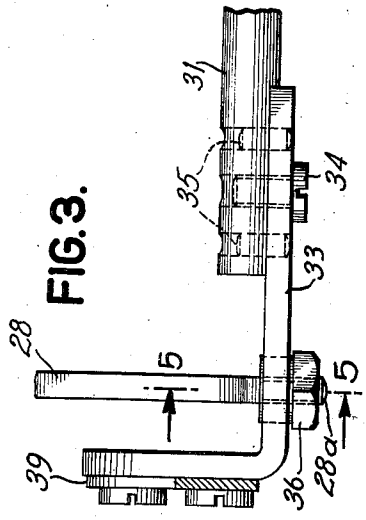


FIG. 3.

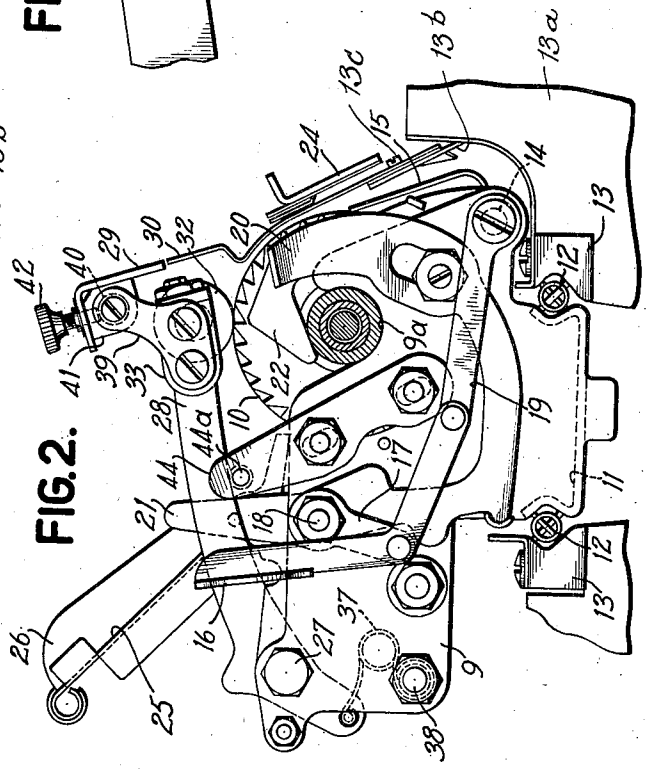


FIG. 2.

INVENTOR
Ronald D. Dodge
BY
Wm. Mahler
ATTORNEY

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TYPEWRITING MACHINE

Ronald D. Dodge, Rochester, N. Y., assignor to International Business Machines Corporation, New York, N. Y., a corporation of New York

Application December 17, 1938, Serial No. 246,262

10 Claims. (Cl. 197—138)

This invention relates to typewriting machines particularly to that type of machine which is designed for the preparation of copy to be used in photographic process of preparing printing plates.

The practice has developed in the printing industry of preparing by photography printing plates directly from copy which has been typewritten instead of first setting the copy in type and then printing from the type or from a printing plate such as a stereotype prepared by means of the composed type. There are many cases where it is necessary to maintain high standards of accuracy as to line length as frequently the typed matter, with a given amount of reduction or enlargement, must fit within an allotted space. For instance, it may be necessary to photographically prepare a printing plate in which the individual pages of the copy appear on the plate in columns in small type requiring that each page of the copy be photographically reduced to a prescribed width of column. For various reasons, it is not always possible or desirable to reduce the copy or enlarge it sufficiently to fill the allotted space and the lengths of the lines on the copy must be very carefully controlled.

In typewriters used for general office work, such as the writing of letters, invoices, etc., the machine is usually equipped with a fixed scale on the carriage which conventionally is graduated in tenths of an inch, the unit of spacing in the more commonly used pica machine. Such scales have the disadvantage that they are permanently secured in the carriage and the zero point on the scale always conforms to the limit of travel of the carriage toward the right whereby all line lengths must either be measured from the limit of travel of the carriage or else a mental computation must be used. Thus, if it is desired to start the line, say two inches from the limit of travel of the carriage, the left-hand marginal stop is set at the point "20" on the scale and the right-hand marginal stop is set at a point dependent upon the width of the line which requires a mental subtracting operation. This is all very well and easily accomplished where the machine is designed to space all characters alike, such as one-tenth of an inch in the case of a pica machine.

Machines have been developed which have been designed especially for the preparation of copy for use in photographic processes of making printing plates. In such machines, the carriage is spaced variable extents for the different letters and other printed characters according to the widths of such characters in order to most simulate type-set matter. Such machines are usually equipped with types having faces like those used in the standard fonts of type employed by printers. In one form which such a machine may take the unit of spacing is of the order of .022" and the characters are spaced amounts varying from 2 to 7 units, such letters as "i" receiving only two units of spacing, whereas other letters, like the "W," may receive as many as seven units of spacing. Obviously, a scale such as is ordinarily employed in typewriters of the type spacing the characters uniformly is not very reliable as with such small units of spacing it is difficult to determine definitely the line length actually. The reason for this difficulty is that the starting point of the line on the work sheet may not agree exactly with a graduation on the scale and likewise the line may not terminate at a point on the work sheet corresponding exactly with a graduation.

It is not practical to graduate the scale in small units of spacing as it would make the scale difficult to read accurately, and two readings at both the beginning and end of a line and a mental computation would still be required of the operator. This is because the line scale usually is fixed and the starting point of a line is seldom at the point on a work sheet corresponding to the limit of travel of the carriage.

An object of the present invention, therefore, is to provide a line measuring device which is particularly well adapted for use in machines in which the characters are spaced variable extents according to their widths and which is capable of measuring the line length accurately notwithstanding extremely small units of spacing of the carriage.

The object of the present invention is to provide a line measuring device capable of indicating small increments of spacing of the carriage.

Another object provides a line measuring device which can be used to directly indicate the length of a line irrespective of the point at which the line commences on the work sheet. In other words, irrespective of the starting position of the carriage.

An object is to provide an indicating device which is especially suitable for use in justifying typewriters, particularly justifying typewriters in which the spacing of the characters varies according to the widths of the characters.

An object is to provide an indicator which is capable of indicating small differences in length in terms of small units of spacing which can not

be very easily read on a line scale graduated in accordance with such small units.

An object is to provide an indicator or line measuring device for accurately measuring the extent of shortage or over-typing of a line with respect to a desired right-hand marginal position.

In variable spacing typewriters in which the carriage is spaced extents depending upon the width of the characters and wherein the spacings of the different characters vary by small units, it is not practical to graduate a scale in such units because the units of spacing are so small that the graduations would be too close together on the scale to be distinguishable with the operator's eyes from twenty to thirty inches from the carriage of the machine as is incidental to a position of correct posture in operating the machine. In order to justify lines so as to preserve an even right-hand margin, it is necessary that the extent of over-typing or shortage of a line with respect to the desired right-hand marginal position be accurately measurable by the operator and with a minimum of mental effort and eye-strain.

The ordinary line scale of a typewriter is not very convenient for this purpose because the line scale is fixed and the marginal stops seldom are set at exact coincidence with either of the zero points on the line scale, whereby a mental calculation is required to ascertain the length of a line or to determine the extent of shortage or over-typing. It is even more difficult to measure the line when a variable spacing mechanism is used because the units of spacing by which the characters differ are so small as to make it difficult to determine the exact length of the line with greater accuracy than two or three units, it being commonly necessary to estimate with reference to an ordinary line scale the actual length of the line. It is desirable therefore, that an indicator be provided which can be positioned so that an arbitrary reference point on the scale, such as a zero point, corresponds with one or the other of the marginal stops or to some position determined by the marginal stops.

The objects of the present invention generally speaking is to obviate all of the defects mentioned above and provide a simple, improved scale device which is capable of accurately measuring the length of the line or the extent of shortage or over-typing of a line as desired and which is capable of being set by movement relative to the carriage so that a reference point on the scale coincides with a predetermined position on the carriage.

An object of the present invention is to provide an improved paper bail.

An object is to provide a paper bail in which the bail rollers press upon a work sheet set on with more equal pressure than has been hereinbefore the case.

Further objects of the instant invention reside in any novel feature of construction or operation or novel combination of parts present in the embodiment of the invention described and shown in the accompanying drawing whether within or without the scope of the appended claims and irrespective of other specific statements as to the scope of the invention contained herein.

In the drawing:

Fig. 1 is a front view of a typewriter carriage with the indicator device attached thereto.

Fig. 2 is a large scale side view of the carriage.

Fig. 3 is a detail view illustrating the means for mounting the cross bar of the paper bail on the arms of the bail.

Fig. 4 is a vertical section on the line 4—4 in Fig. 1.

Fig. 5 is a section on the line 5—5 in Fig. 3.

In Figs. 1 and 2 the carriage consists of end plates 9 which rotatably support the platen 10 and are secured to the ends of a channel-shaped member 11. The latter is grooved to receive anti-friction roller trucks 12 by means of which the carriage is mounted on the rails 13. The rails 13 are mounted on the main framework 13*a* (Fig. 2). Journalled in the plates 9 is a shaft 14 which pivotally supports the usual front paper deflector 15. Shaft 14 also carries an arm (not shown) on which the usual paper deflector and pressure roller assembly is mounted (not shown). The reference numeral 16 designates one of the usual pressure roller release levers which is pivoted at approximately its midpoint on an arm 17 loosely mounted on a stud 18 carried by the adjacent end plate 9. The other end of the lever 16 is pivoted to an arm 19 which is secured to the shaft 14.

When the lever 16 is drawn forwardly by the operator, that is to the right in Fig. 2, the arm 17 swings forwardly and lever 16 is rocked clockwise to depress the end of arm 19 and rock shaft 14 counterclockwise to withdraw the pressure rollers and paper deflector from the platen.

Also pivoted on the stud 18 is the usual carriage release lever 20 which effects disengagement of the escapement mechanism from the carriage to permit the carriage to be moved by hand in either direction. A lever 21 pivoted on stud 18 controls the line space mechanism to determine whether line spacing is to be effected with single, double, or triple spacing.

The platen 10 is rotatably mounted in open slots 9*a* (Fig. 2) formed in plates 9 and is held in such slots by means of latches 22 which are spring-urged into latching position by springs 23 (Fig. 1) coiled about the shaft 14. The numeral 24 designates the usual type guide located near the center of the machine which guides the type into engagement with a work sheet on the platen. The usual paper table is designated 25 in Fig. 2, on which table is adjustably mounted the marginal guide 26 cooperating with the left-hand edge of a work sheet wrapped around the platen.

Pivotally mounted on studs 27 carried by the plates 9 (Fig. 2) is the paper bail which includes arms 28 supporting part of the line measuring device. This device includes two coacting and relatively movable scales 29 and 30, of which scale 29 moves with the carriage while scale 30 is secured to a fixed part 13*b* of the framework 13*a* of the machine by means of screws 13*c* whereby scale 30 remains stationary when the carriage moves. The paper bail also includes a cross rod 31 on which are slidably mounted the usual bail rollers 32 (Figs. 1 and 2). The ends of the paper bail rod 31 are mounted on arms 28 by means of L-shaped brackets 33. As best shown in plan view in Fig. 3, the rod 31 is secured to the longer arms of the brackets 33 by means of screws 34 and pins 35 whereby the brackets 33 and rod 31 are made incapable of relative movement. Thus the paper bail comprises the arms 28, brackets 33, the cross rod 31, and the rollers 32.

The brackets 33 are loosely mounted on the ends of the arms 28 in such fashion that there is small amount of lost motion present sufficient to enable the bail rollers 32 to press evenly on the work sheet on the platen whereby both of the bail rollers 32 bear against the platen with equal pressure provided, of course, that the roll-

ers are located equal distances from the ends of the rod 31 as should be the case. For the purpose of loosely mounting the brackets 33 on the ends of the arms 28, the latter are formed with a reduced portion 28a best shown in Fig. 5, which is threaded to receive a bushing 36 having a hexagonal portion and a cylindrical portion which loosely fits in a hole bored in the adjacent bracket 33. Toggle springs 37 (Fig. 2), attached to studs 38 carried by the plates 9 and to studs on the arms 28 tend to rock the arms 28 in a clockwise direction (Fig. 2) so as to press the bail rolls 32 against the top side of the platen. Owing to the loose fit of the brushings 36 in the brackets 33, the rollers 32 tend to press equally upon the platen and the permanent skewing effect which is commonly experienced when the rod 31 is rigidly secured to arms like 28 by means of screws at the ends of the rods, is obviated.

Secured to the shorter arms of the brackets 33 are arms 39 which project upwardly and slightly to the right, Fig. 2. Rigidly fastened to the ends of the arms 39 is a rod 40 which extends parallel with bail rod 31 and the platen 10. The scale 29 is slidably mounted on the rod 40 by means best shown in Fig. 4. This scale 29 is angle-shaped in transverse section and is secured to two blocks 41 which are threaded to receive the shanks of thumb screws 42. The rod 40 has a longitudinal slot in which is secured a rib 43 which loosely fits slots formed in the blocks 41. By the foregoing means the assemblage comprising the scale 29, the blocks 41, and the thumb screws 42 is slidable on the rods 40 but is prevented from rotating on the rod.

The scale 29 has a zero mark and two series of graduations on each side of the zero mark designated 29a and 29b, respectively. The illustrated scales 29, 30 shown in Fig. 1, are shown as graduated for use with machines in which the characters printed by the type bars are spaced variable extents commensurate with their widths and in which the spacing of the characters varies by small units of the order of .022". This of course, is the value which is required for a particular kind or size of the type and the basic unit of spacing will depend on the size and kind of type.

The scale 29 is provided with graduations for every 10 units of spacing, the scale 29a being graduated arbitrarily from 0 to 300, while the scale 29 is only graduated from 0 to 150. The scale 29a may be marked with a plus sign while the scale 29b may be marked with a minus sign. The lower scale 30 likewise has two series of vernier graduations designated 30a and 30b on each side of a zero mark located at the center of the scale.

In typing a preliminary draft copy of material to be subsequently justified, the left-hand marginal stop is set to determine the left-hand marginal position and, with the carriage in this position, the scale 29 may be moved longitudinally of rod 40 until the zero mark on the scale 30 coincides with the graduation on scale 29a opposite the number corresponding to the desired line length. Thus, in Fig. 1, the carriage may be considered as in the left-hand marginal position, with the scale 29 adjusted to indicate a line length of 180 units of spacing.

As the typing proceeds, the scale 29 moves to the left with the carriage and the zero on scale 29 approaches the zero mark on scale 30. At the end of the line the zero mark on scale 29 may not have passed the zero mark on the scale 30, but the former may have some position to the right of the latter. This indicates that the line has been typed short by a predetermined number of units and that, therefore, the spacing between words must be increased in re-typing the draft to obtain an even right-hand margin.

The extent the line is typed short is directly readable to the nearest ten units of spacing by noting on scale 29a the nearest graduation to the right of the zero mark on scale 30 identified by a number. To ascertain the remaining digit in the amount of the line shortage, the operator next observes with reference to scale 30a which of the numbered graduations thereon exactly coincides with a graduation on the scale 29a. For instance, let it be supposed that the zero mark on the scale 30 is midway between the graduations 20 and 30 on the scale 29a, and that the graduation corresponding to the value 5 on scale 30a exactly registers with a graduation on the scale 29a. This means that the line is twenty-five units short of the desired marginal position and, to justify this line, five units of spacing must be added between words in re-typing that line to make the line 180 units long, this being the standard of line length selected for purposes of illustration.

It may happen, however, that the operator eventually types a line then that is longer than the one set as a standard, whereby the zero mark on scale 29 takes some position to the left of the zero mark on the scale 30. The operator follows the same procedure in reading the indicator device except that he uses the scales of graduations 29b and 30b instead of the scales 29a and 30a. Thus, if the zero mark on the scale 30 is located exactly half-way between the graduations corresponding to 20 and 30 on scale 29b, the graduation corresponding to the value 5 on scale 30b, will be exactly opposite a graduation on scale 29b. This indicates that the line has been typed 25 spaces beyond the desired right-hand marginal position. In other words, the line is 205 units long. Since usually the right-hand marginal position is nearer to the right-hand end of the platen than to the center of the platen, the scale 29b need not be as long as scale 29a.

The foregoing procedure may be employed when the line length is known beforehand, as where a definite standard has been set up according to requirements of photographic reproduction or for some other reason. However, there are occasions where the exact line length may not be known in advance, as where it is necessary to type until a prescribed line space has been filled. Then the line length must be measured and the scale must be set so that subsequent lines will be typed according to the procedure described in the last paragraph to determine the extent of shortage or overtyping according to the standard initially established in typing the first line. The operator sets the left-hand marginal stop to correspond with the desired starting position of the carriage and then proceeds to type the line until it fills the space allotted to the line. The carriage is left in the position to which it moves after typing the last character in the line and the scale 29 is moved to bring the zero mark thereon in register with the zero mark on the scale 30. The carriage is then returned in the usual way until it is stopped by the left-hand marginal stop. The scale 29a is now read in conjunction with the scale 30a if necessary to determine the exact length of the line which has been typed. With the scale left in this position the operator then proceeds to type the remaining lines and, in the case of those

lines which do not terminate exactly at the marginal position, the extent of shortage or overtyping is determined in the manner described above.

On the scale 29, the plus sign to the left of the zero mark indicates that readings obtained on this scale denote the number of units of spacing to be added to the spacing between words in re-typing the line with a justified margin. The minus sign on the right of the zero mark likewise indicates the number of units that are to be subtracted in order to justify the line.

It will be seen that the line measuring device is flexible in its use since it is adaptable to both the case where the exact length of line is known beforehand and to the case where it is necessary to type a line to fill a prescribed space before the actual line length can be determined and mental calculation is eliminated.

Since the scale 29 is mounted upon the rod 40 it is movable with the paper bail comprising arms 28 and the cross rod 31 whereby both the scale 29 and the paper bail may be moved to an inoperative position when it is desired to insert work sheets around the platen. Since the rod 31 is loosely mounted on the ends of arms 28 and the latter of necessity must be made very light and furthermore must be made rather long in order to provide a clear space for manipulating work sheets, there is a tendency for the assembly including the scale 29 and the rods 31 and 40 to move lengthwise of the carriage when the carriage is moved in a letter spacing direction, tabulated, or returned. It is absolutely necessary in the interests of accuracy that the scale 29, once set in adjusted position, be incapable of movement longitudinally of the platen as a small amount of displacement can result in quite a large error in measuring the length of a line. For this reason, means is provided which holds the paper bail and indicator assembly against movement longitudinally of the platen. This means consists of arms 44 (Fig. 2) which are adjustably secured to side plates 9 of the carriage. These arms 44 engage the sides of the arms 28 and thereby prevent longitudinal movement of the paper bail and indicator device during carriage return movements and other movements of the carriage and against accidental displacement by contact with the operator's hand. There are two of the arms 44, one for each plate 9, and they are so mounted that each arm contacts with the side of the arm 28 opposite the center of the carriage so that the arms oppose each other and thereby prevent movement of the paper bail and indicator device assembly in either direction longitudinally of the platen.

Since the platen is removable, it is desirable to provide means to prevent the paper bail and indicator device assembly from dropping into the space normally occupied by the platen. This means consists of pins 44a mounted on the ends of the arms 44 and contacting with the arms 28 to limit clockwise movement thereof (Fig. 2).

The studs 38 to which the toggle springs 37 are attached are so placed on the plates 9 that these springs tend to hold the paper bail and indicator device assembly in either of its alternate positions.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single embodiment it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. In combination with the framework and the carriage of a typewriting machine, a platen mounted in the carriage, a paper bail movable into and out of cooperation with the platen to hold work sheets wrapped around the platen, a line measuring scale movably mounted on the paper bail for adjustment longitudinally of the platen, and a vernier scale cooperating with the first-named scale and mounted on said framework, said scales being cooperative to measure the lengths of lines.

2. In combination with the framework and the carriage of a typewriting machine, a platen mounted in the carriage, a pair of arms located at the ends of the carriage, a line scale mounted on said arms and adjustable longitudinally of the platen, a supplemental scale mounted on said framework whereby said scales are movable relative to each other when the carriage moves; said first scale being graduated in multiples of a unit of spacing, said second scale constituting a vernier scale and graduated in units of spacing; and means to hold the first-named scale in cooperation with a work sheet wrapped around the platen.

3. In combination with the frame work and the carriage of a typewriting machine, a bail pivotally mounted in the carriage and extending parallel with the line of travel of the carriage, a scale member slidably mounted on said bail, means to lock the scale member in its longitudinally adjusted positions, a second scale member mounted on the framework whereby said scale members move relative to each other when the carriage moves; one of said members being graduated relatively coarsely, the other of said scale members being graduated in terms of units of space encompassed by two graduations on the other scale whereby the two scales in cooperation with each other may be used to measure the extent of carriage movement in terms of small units of spacing; and means cooperating with the bail to hold the fixed scale member in cooperation with the work sheet on the carriage, said last-named means being operative when the bail is moved away from the platen to hold the scale member in an inactive position.

4. In combination with the framework and the carriage of a typewriting machine, a platen rotatably mounted in the carriage, a support frame pivotally mounted in the carriage and having rollers engageable with the platen, means tending to urge said frame and said rollers into contact with the platen, a scale adjustably mounted on said support frame so as to be removable longitudinally of the platen, said scale being graduated according to multiples of units of spacing of the carriage and movable to bring an arbitrary mark thereon into correspondence with one of the limiting positions of the carriage movement, and a second scale cooperating with the first-named scale and mounted on said framework so as to remain fixed when the carriage moves and relative to which the first-named scale moves, said second-named scale having an index mark coinciding with the arbitrary mark on the first-named scale when the carriage is in one of its limiting positions according to the setting of the first-named scale.

5. In combination with the carriage of a typewriting machine, an indicator support frame connected to the carriage, rollers on said frame en-

gageable with the platen whereby said frame is supported by the platen; a line measuring scale mounted on said frame, said line measuring scale being graduated in terms of units of spacing; means to adjust the line measuring scale longitudinally of the platen to bring a mark thereon into coincidence with either of the limits of travel of the carriage, and a relatively fixed member having an index mark cooperating with said scale and relative to which the scale is movable to indicate the length of a line.

6. In combination with the carriage of a typewriting machine, a platen rotatably mounted in the carriage; a line measuring scale adjustably movably mounted in the carriage for movement into and out of cooperation with the platen and for adjustment longitudinally of the platen, said line measuring scale having an arbitrary zero position and two series of graduations denoting units of spacing of the carriage disposed longitudinally of the scale and on either side of the zero position, said series of graduations denoting the extent of shortage of a line or over-typing with respect to an arbitrary standard of line length; and a fixed member having an index mark coacting with said scale with which said index mark on the scale may be initially set when the carriage is in a position corresponding to the end of a line conforming to the arbitrary standard.

7. In combination with the framework and the carriage of a typewriting machine, a paper bail movably mounted on the carriage and cooperating with the platen at the delivery side thereof, a line measuring scale movably mounted on the paper bail and having an arbitrary index mark, and means mounted on said framework and having an index mark cooperating with the scale and relative to which second index mark the scale moves when the carriage moves, said scale being adjustable, when the carriage is in a predetermined position such as a marginal position, to bring the index mark thereon into coincidence with the second index mark.

8. In combination with the framework and the carriage of a typewriting machine, a platen rotatably mounted on the carriage; a line measuring scale assembly movably mounted in the carriage so as to be settable in contact with the platen, said line measuring scale assembly being provided with rollers for supporting said scale on the platen, said line measuring scale assembly having a scale adjustable longitudinally of the platen to bring an arbitrary index mark thereon into coincidence with a preselected starting or terminal position of the carriage; and a supplemental scale mounted on said framework and cooperating with line measuring scale when it is supported by the platen and relative to which said line measuring scale moves when the carriage moves, said supplemental scale having an index mark coinciding with the index mark on the line measuring scale when the carriage is in either the initial or terminal position in coincidence with which the index mark on the line scale has been set.

9. In combination with the carriage of a typewriting machine, a paper bail movable into and out of contact with the platen and cooperating with the latter to feed a work sheet, a line measuring scale adjustably mounted on the bail, said scale being positionable to measure the length of a line irrespective of the starting or terminating point of the line, and an element having an index mark cooperating with said scale.

10. In combination with the framework and the carriage of a typewriting machine; a paper bail comprising a pair of arms pivotally mounted on the carriage, a cross member, rollers mounted on the cross member, and means to loosely join the cross member to the arms of the paper bail to enable said rollers to bear evenly on the platen; spring means to actuate said arms to press the paper bail into cooperation with the platen to engage the rollers to the platen, and a line measuring scale adjustably mounted on said bail for movement longitudinally of the cross member.

RONALD D. DODGE.