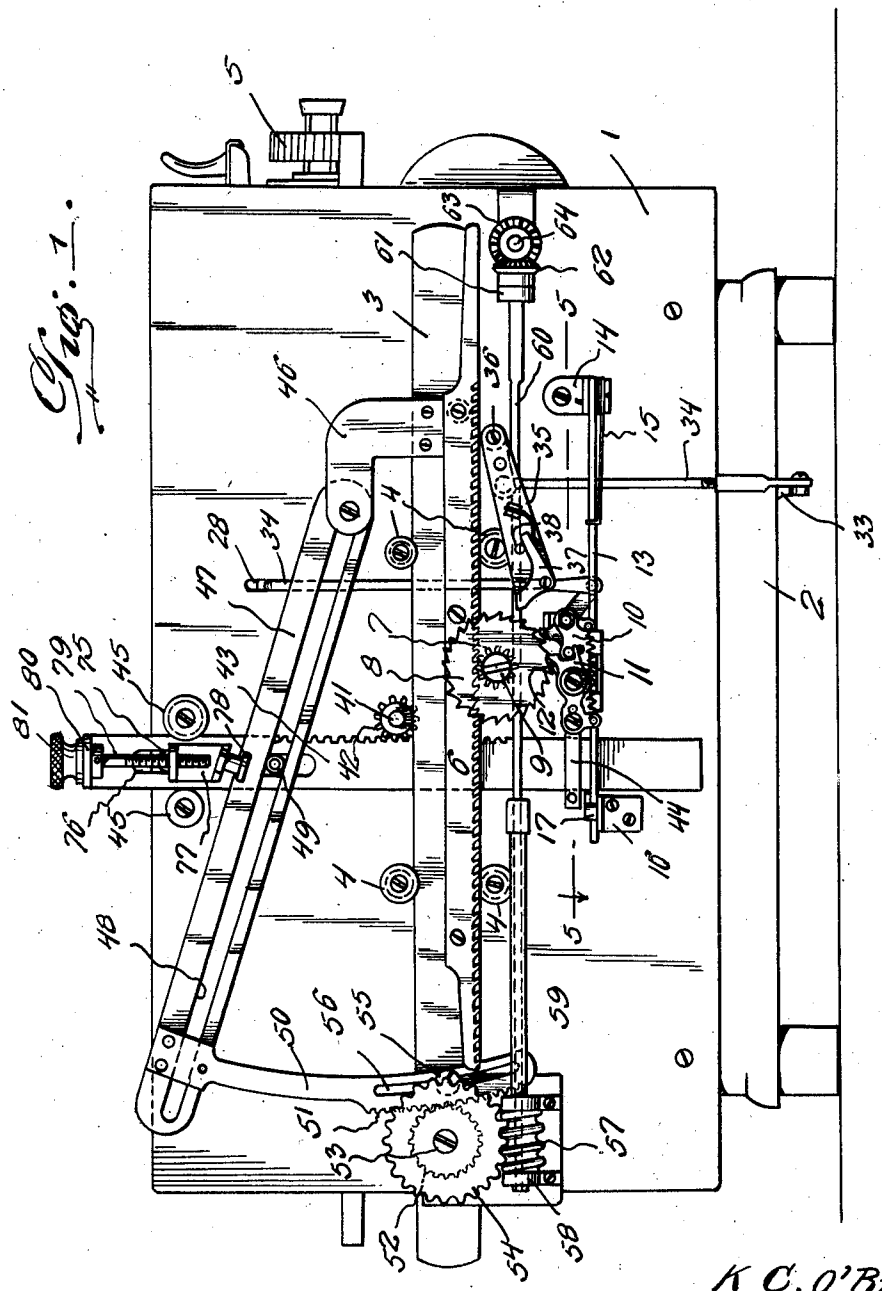
Dec. 4, 1928. 1,693,796

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SPACE GRADUATING MECHANISM FOR TYPEWRITERS AND THE LIKE

Filed Oct. 14, 1925 4 Sheets-Sheet 1

Fig. 1.



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SPACE GRADUATING MECHANISM FOR TYPEWRITERS AND THE LIKE

Filed Oct. 14, 1925 4 Sheets-Sheet 2

Fig. 2.

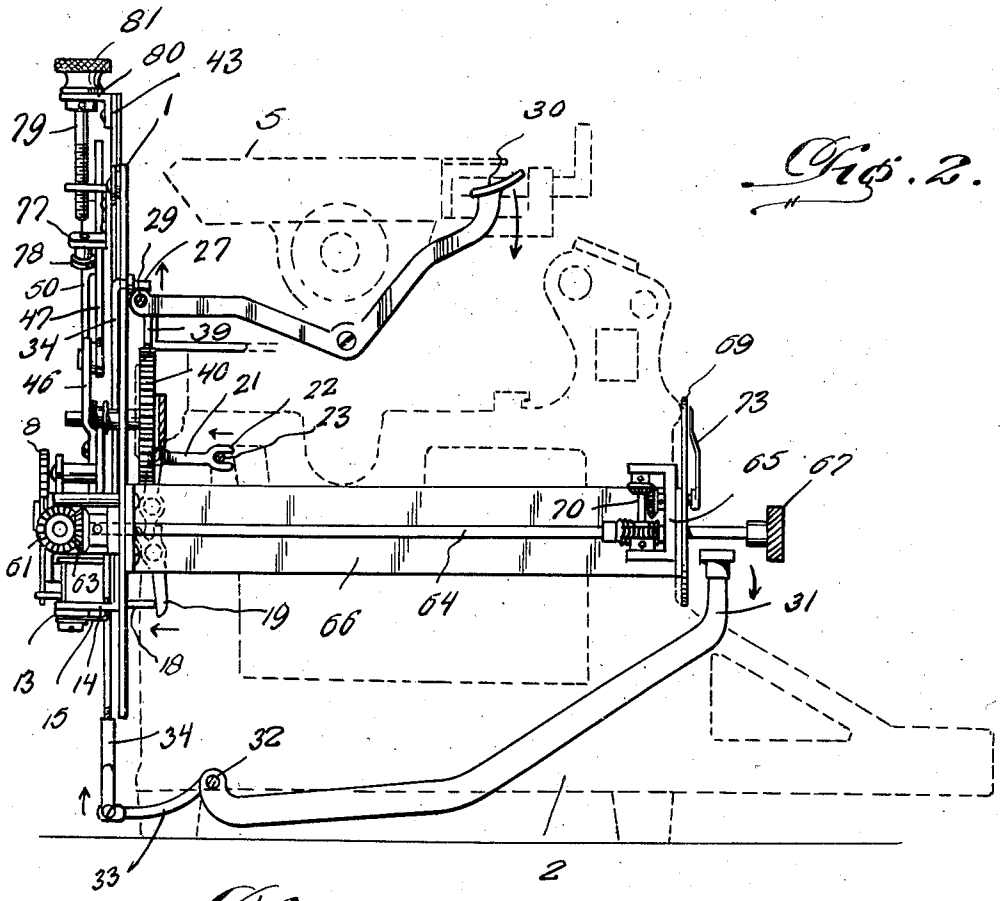
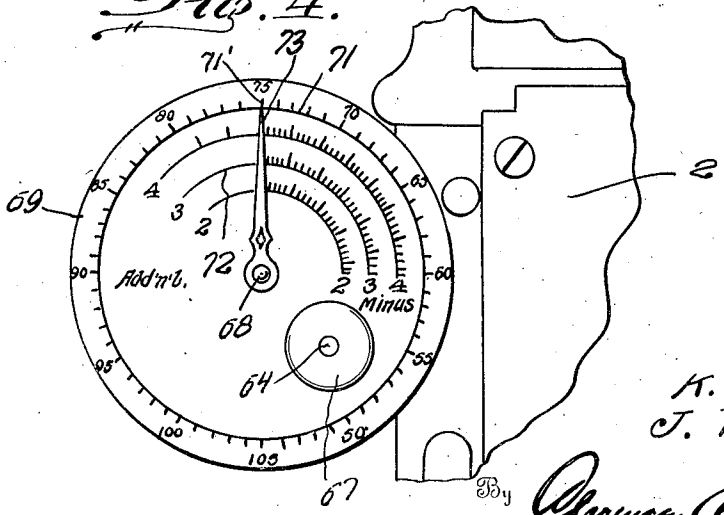


Fig. 4.



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SPACE GRADUATING MECHANISM FOR TYPEWRITERS AND THE LIKE

Filed Oct. 14, 1925 4 Sheets-Sheet 3

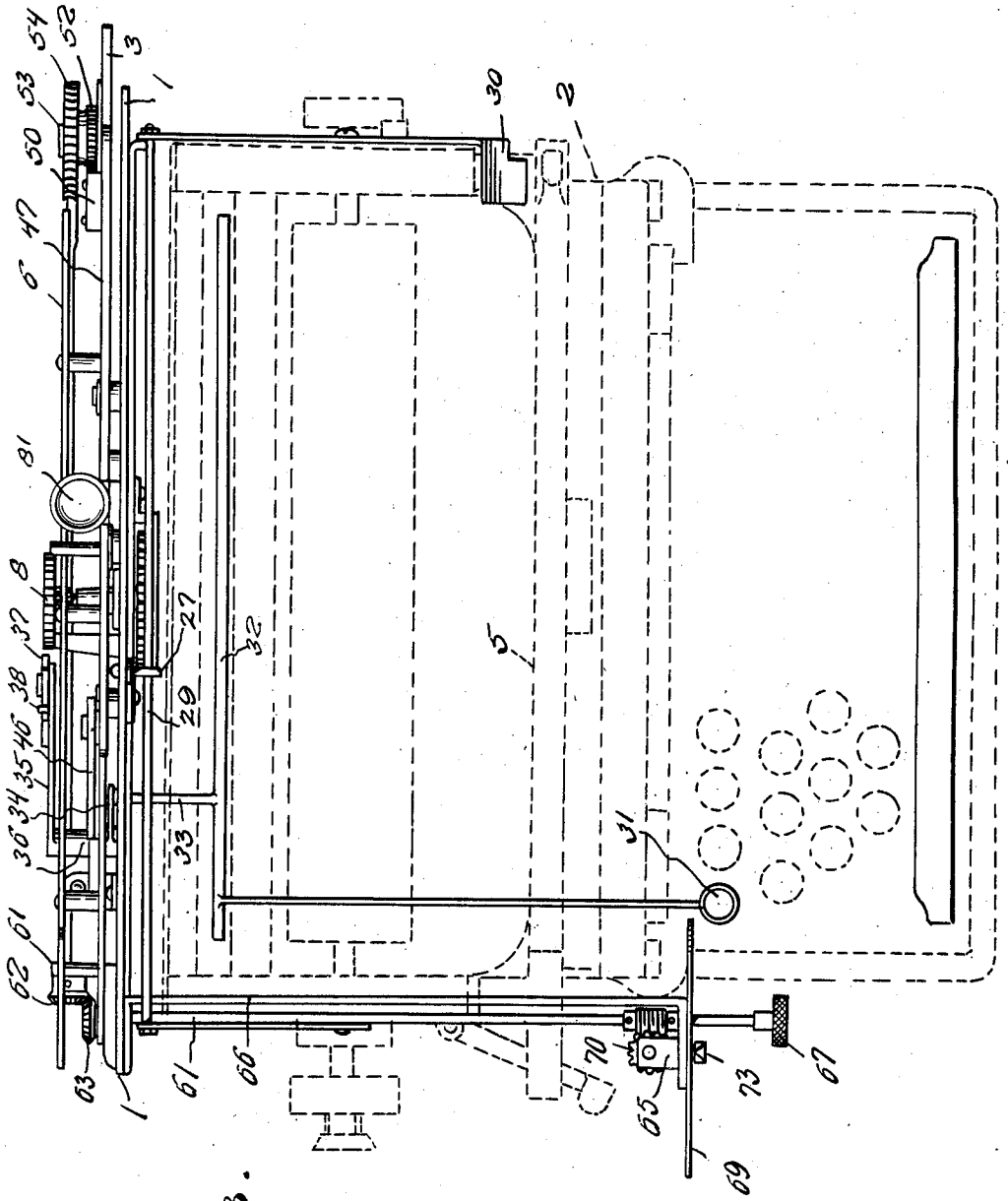


Fig. 3.

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SPACE GRADUATING MECHANISM FOR TYPEWRITERS AND THE LIKE

Filed Oct. 14, 1925 4 Sheets-Sheet 4

Fig. 5.

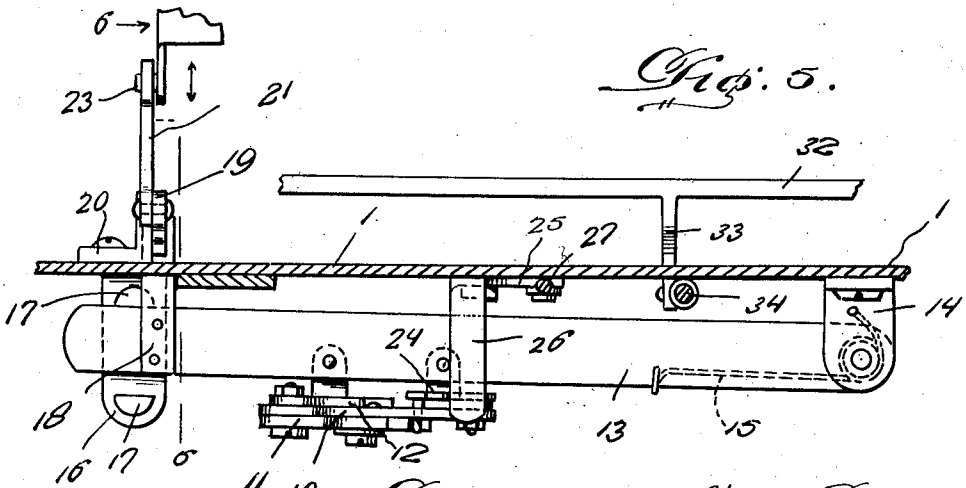


Fig. 6.

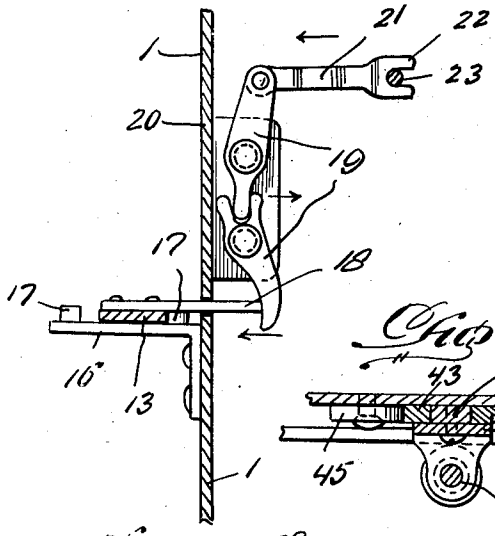


Fig. 7.

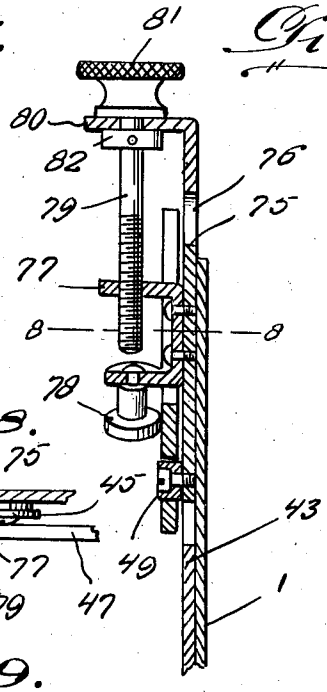
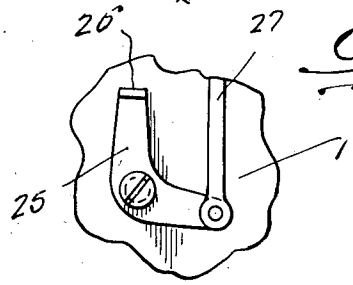


Fig. 8.

Fig. 9.



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UNITED STATES PATENT OFFICE.

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SPACE-GRADUATING MECHANISM FOR TYPEWRITERS AND THE LIKE.

Application filed October 14, 1925. Serial No. 62,448.

This invention relates to a space graduating mechanism with associated compensating means adapted for attachment to or incorporation in the well known forms of typewriter constructions.

The invention relates to substantial improvements in the structure shown in Patent No. 1,457,853, granted June 5th, 1923, and in this connection, the invention is directed to the employment of a specifically new principle of operation adapted to simplify the structural relation of the parts of the space graduating mechanism.

An object of the invention resides in providing a carrier independently movable with respect to the typewriter carriage controlled by an escapement mechanism for movement in a uniform predetermined manner, a graduating mechanism being provided between the carrier and the carriage which are movable in the same direction for graduating the movement of the carriage with respect to the carrier to provide a predetermined ratio of movement of the carriage relative to the carrier in the release of the escapement mechanism.

Another further object of the invention resides in providing a carrier movable in the same direction as the carriage of a typewriter and controlled by a standard escapement mechanism on which is mounted space graduating means adapted to control the movement of the carriage in a predetermined ratio with respect to the movement of the carrier, for graduating the type spacing of the typewriter in a line.

A further object of the invention resides in providing a compensating mechanism associated with the spaced graduating means operable to retain a predetermined relation or position between the carrier and the carriage in order that an even margin at the left hand side of a page being typewritten may be maintained although the line spacing of various lines throughout the page are graduated for different spacing in the line.

Another object of the invention resides in associating the back spacing mechanism of the typewriter for direct operation on the star wheel of the escapement mechanism.

The invention comprehends numerous other important features in the construction and relation of the structural elements of the device which are more particularly and fully pointed out in the following description directed to the preferred form of construction, it being understood, however, that the structure and association of the parts of the space graduating mechanism and of the compensating mechanism may be varied in a desired manner for adapting the construction to the various forms of typewriter constructions now manufactured and used, without departing from the spirit and scope of the invention as herein set forth.

In the drawings forming part of this application:

Figure 1 is a rear elevational view of the invention showing the essential portions of the space graduating mechanism and also the compensating means.

Fig. 2 is an end elevation of the invention applied to a typewriter construction showing the operating connections between the typewriter and the compensating and graduating mechanisms.

Fig. 3 is a plan view of the invention applied to a typewriter.

Fig. 4 is an enlarged detail elevation of the operating means for adjusting the space graduating mechanism for changing the ratio between the movement of the carriage and the carrier and the indicating dial associated therewith for indicating the character spacing of the adjustment.

Fig. 5 is a sectional view taken on line 5—5 of Fig. 1, on a substantially large scale, showing the mechanism operated by the spacing bar of the typewriter, and a portion of the escapement mechanism controlled thereby.

Fig. 6 is a sectional view taken on line line 6—6 of Fig. 5, showing the manner in which the escapement mechanism is connected and associated with the standard spacing mechanism of the typewriter for operation and control thereby.

Fig. 7 is a vertical sectional view showing the details of construction of the compensating mechanism.

Fig. 8 is a horizontal sectional view taken on the line 8—8 of Fig. 7.

Fig. 9 is a detail enlarged elevational view of the escapement releasing lever for releasing the carriage in the usual and well known manner.

A plate member 1 is suitably secured to the typewriter frame structure indicated at 2 and to the back portion thereof and forms the main support for the mechanism forming the subject matter of this invention. A car-

rier 3 is mounted on the rear face of the plate 1 between the supporting rollers 4 mounted on the plate, so that the carrier may be moved back and forth across the plate member 1, in the same direction as the movement of the carriage 5 more particularly illustrated in dotted lines in Fig. 2. The rack bar 6 forms a part of this carrier and has the teeth thereof intermeshed with the pinions 7 on the escapement wheel 8 which is mounted on the stub shaft 9 secured to the supporting plate 1.

The usual spring drum of the typewriter structure which serves to operate the carriage provides the power for operating the entire mechanism of this invention and the same is controlled by the movement of the star wheel 8 through the operation of the escapement mechanism indicated generally at 10 which operates in the usual well known manner at present known in the art. This escapement mechanism comprises a pair of cooperating pawls 11 and 12 adapted to permit a step by step movement or rotation of the star wheel 8 in the lateral movement thereof relative to the star wheel. This escapement mechanism 10 is mounted on the horizontally movable bar member 13 pivoted to the bracket 14 at one end which is secured to the supporting plate 1 and normally operated in one direction by the spring 15. The opposite end of this bar member 13 is slidably supported on the bracket 16 secured to the supporting plate 1 and is adapted for limited movement between the stops 17 carried by the brackets 16. An arm 18 is mounted on the end of this bar 13 and extends through an opening in the supporting plate 1 for engagement with the end of one of a pair of interconnected levers 19 mounted on the bracket 20 secured to the supporting plate, the other end of the pair of levers carries the arm 21 having the forked end 22 receiving the pin 23 carried by the typewriter spacing mechanism, which is operated in each operation of the spacing bar or any one of the type keys of the typewriter for releasing the carriage through the operation of the escapement mechanism to permit one step of movement thereof in the usual and well known manner. This operation of the type bars or space bar of the typewriter will therefore permit of a step by step movement of a predetermined uniform character on the part of the carrier 3 which will also permit of a step by step movement of the carriage 5 of the typewriter, in which the movement of the carriage will have a predetermined ratio with respect to the movement of the carrier 3.

The standard escapement mechanism 10 of the typewriter as is well known in the art is usually provided with an operating arm such as shown in Fig. 5 at 24 with a lever adapted to move the pawls 11 and 12 on their pivots to release them from engagement with the teeth of the star wheel 8, for permitting the release of the escapement mechanism and the free movement of the carriage independently thereof. In the present invention, this mechanism is operated in the same manner by the operation of the lever 24 which releases the escapement mechanism from cooperation with the star wheel, and permits the free movement of the carriage 5 and the carrier 3. The lever 24 is operated by the bell crank 25 pivotally supported on the plate 1 having the laterally extending arm 26 engaging the end of the lever 24, while the opposite end of the bell crank is provided with the link connection 27 extending upwardly along the rear plate of the supporting face 1, with the upper terminal bent laterally and extending through the slot 28 in the plate 1 for engagement over the bar 29 of the escapement releasing mechanism operated by the lever 30 of the usual standard typewriter structure. Upon depressing the lever 30 in the usual manner as shown in Figs. 2 and 3, the bar 29 of the escapement releasing mechanism of the typewriter will operate the link 27 and the bell crank lever 25 for transmitting the motion to the lever 24 which will release the escapement mechanism and permit free operation of the carriage under the action of the usual spring drum normally adapted to move the carriage in one direction.

The usual typewriter construction is equipped with a back spacing device which is used without modification in the present invention for producing back spacing of the carriage. The back spacing key is indicated at 31 in Figs. 2 which operates the rotatable shaft 32 mounted in the typewriter frame forming part of the usual back spacing mechanism while for the purpose of the present invention, this shaft 32 is equipped with an arm 33 projecting rearwardly therefrom and at the free end of which is attached a connecting bar 34 secured at its upper end to the lever 35 pivoted at one end thereof as indicated at 36 on a suitable support carried by the supporting plate 1, while the opposite end of the lever 35 carries the pawl 37 which is adapted upon the depression of the back spacing lever 31 to engage one of the teeth of the star wheel 8 and produce a reverse rotation thereof through one step of movement, which will move the carriage 5 back one space against the tension of the spring drum normally adapted to operate the same in the opposite direction. The pawl 37 is pivotally mounted on the end of the lever 35 and normally held with one end in engagement with the stop 38 by a suitable leaf spring mounted on the lever 35, which in the operation of the back spacing mechanism, will permit the pawl 37 to ride over the teeth of the star wheel 8 so that the step by step movement may be provided in the usual manner. This feature of the invention is regarded as of special importance in view

of the cooperation of the back spacing mechanism directly with the star wheel of the typewriter structure which forms a more direct manner of operating and producing back spacing with a reduction of parts.

The usual latch bar mounted on the typewriter carriage is indicated at 39 intermeshing with which is the lower pinion 40 mounted on the stub shaft 41, rotatably mounted in the supporting plate 1 and carrying the small pinions 42 which intermeshes with the actuated slide member 43 mounted for sliding movement in the guide 44 at the lower end and between the rollers 45 at the upper end. The edge portion of this actuated slide member is provided with rack teeth intermeshing with the pinion 41 as clearly illustrated in Fig. 1 of the drawings. This actuated member 43 forms part of the space graduating mechanism of this invention and is part of the mechanism which is operated at the graduated ratio of movement relative to the standard uniform movement of the carrier 3.

The main portion of the space graduating mechanism or means of this invention is mounted on and forms part of the carrier structure 3. A bracket member 46 is mounted on the carrier 3 and pivotally mounts one end of the graduating member 47 thereon. This graduating member 47 is formed with a slot 48 extending throughout its length which slidably receives the roller 49 adjustably carried by the actuated slide member 43 in a manner which will presently be described, by which the movement of the carrier 3 is transmitted to the slide member 43.

The free end portion of the graduating member 47 mounts an arcuate arm 50 provided with the rack 51 intermeshed with the pinion 52 operable on the stub shaft 53 carried by the carrier 3 and rotatable with the worm gear 54. A suitable form of pin 55 projects through the slot 56 of the arcuate arm 50 and serves to guide said arm on the carrier and provide a substantially rigid support for the free end of the graduating arm 47. A worm 57 rotatably mounted in bearings 58 carried by the carrier 3, intermeshes with the worm wheel 54 and is mounted on the tubular shaft 59, slidably receiving the telescoping shaft 60 which are mounted to prevent rotation of the tubular shaft 59 with respect to the shaft 60. This permits of a free sliding movemnt of the tubular shaft 59 with the carrier 3, the shaft 60 lying in the line of movement of the carriage and in addition to being supported by the tubular shaft 59, has a bearing 61 on the supporting plate 1. The free end of the shaft 60 mounts a beveled pinion 61 intermeshing with the beveled pinion 63 mounted on the shaft 64 extending substantially at right angles to the shaft 60 and along the side of the typewriter frame as shown in Figs. 2 and 3 to the forward end of the typewriter frame adjacent the keyboard. At this forward end of the shaft 64, the same is provided with a bearing in the bracket 65 mounted on the forwardly extending supporting arm 66 carried by the supporting plate 1, while the forward end of the shaft 64 is provided with an operating knob 67 so that the worm 57 may be rotated for transmitting movement through the worm wheel 52 for adjusting the space graduating mechanism of the typewriter and particularly the graduating bar 47 for graduating the spacing of the typewriter by varying the ratio of movement between the carriage 5 and the carrier 3. The bracket 65 at the forward end of the arm 66 rotatably mounts the small shaft 68 projecting through the indicating dial 69 secured to the bracket, which is rotated upon the operation of the shaft 64 through the reducing gearing indicated at 70 driven by a worm wheel and pinion from the shaft 64.

The dial 69 is provided with a circle 71 adjacent the periphery thereof having the divisions marked thereon as clearly indicated in Fig. 4, in which the divisions are constructed for representing additional or fewer characters for a line of printing more or less than the standard number of characters for which the typewriter construction is made. This scale on the circle 71 has the points 71′ thereon adapted for cooperation with the pointer 73 mounted on shaft 68 so that the space graduating mechanism will be set for standard spacing at this point. In order to obtain one or more additional characters in a line, of print on the typewriter, the knob 67 is operated to move the pointer to the left or in an anticlockwise direction as shown in Fig. 4 over the scale 71 one or more divisions in accordance with the number of additional characters desired in the line. Should fewer characters be desired in a line of type as compared with the standard number in a line, then the knob 67 is operated to adjust the space graduating mechanism while the pointer 73 moves in a clockwise direction over the graduations on the circle 71 a desired number of points in accordance with the fewer characters desired in the line of printing. With said opposite one of these pointers, it can then be accurately determined on the indicator dial exactly how many characters are typed in a line of printing by the predetermined setting of the space graduating mechanism.

Should it be desired to have one or more additional or fewer characters in a space smaller than the length of the standard line of printing by the typewriter, it has been found necessary to provide additional graduations on the dial for this purpose. The concentric graduated circles indicated by the numeral 72 have therefore been provided as illustrated in Fig. 4 for the purpose of illus-

tration, to indicate how one or more additional or fewer characters in a two, three, or four inch space may be obtained by the operation of the space graduating mechanism which will be indicated on the dial. Thus, should it be desired to have one or more additional or fewer characters within a predetermined space as just set forth, for certain predetermined spaces, then the proper graduation on the concentric circle 72 corresponding to the spacing desired is selected and the knob 67 operated to set the pointer 73 over the desired graduation for the additional or fewer characters desired. In this way various forms of tabulations can be made on ruled paper such as used in making statements or bills in order that items may be properly identified within the space provided therefor on the paper being printed.

The operation of the knob 67 raises or lowers through the rotation of the worm wheel 54 the graduating member 47 through moving the same on its pivotal connection with the bracket 46 and in this movement transmits a movement to the actuating member 43, operating the same a slight distance which produces a small rotation of the pinions 42 and consequently a movement of the carriage 5, while during this adjustment the carrier 3 remains stationary. This change of relation between the movement of the carrier and the carriage changes the vertical alinement of the type so that if it be desired to write one line having one space adjustment, and the next line at a different space graduation, it is to be understood that the line cannot be started with a letter directly under the letter of the preceding line, at the left hand margin of the page, which is usually made uniform for the production of neat work. In order that an even margin may be made on the left hand side of the sheet, a compensating mechanism is provided on the typewriter which is shown more clearly in Figs. 1, 7 and 8.

This compensating mechanism includes a slide plate 75 slidably mounted in the elongated slot 76 formed in the actuating slide member 43, which slide plate rotatably mounts the roller 49. A U-shaped bracket 77 is mounted on the slide plate, one leg of which carries the retaining rollers 78 which engages the rear face of the graduating member 47 and retains the same in proper associated relation with the actuated member 43. The upper leg portion of the U-bracket 77 is provided with a threaded opening threadedly receiving the screw member 79 which extends through the laterally bent upper end of the member 43 indicated by the numeral 80.

The upper end of the rod 79 carries the operating knob 81 which has a bearing against the laterally projecting portion 80, while immediately below this portion 80 is mounted a collar 82 secured on the shaft 79 to prevent axial movement thereof with respect to the actuated slide member. From this construction, it will be seen that by rotating the knob 81 that the slide plate 75 can be moved longitudinally of the actuated member 43 which will produce a movement of the actuated member when the graduating member 47 is held stationary so that the motion of the actuated member will be transmitted to the carriage 5 by means of the pinion 41 and the large spur gear 40.

This compensating device therefore provides a means of adjusting the carriage relative to the carrier 3 so that any predetermined relation between these two essential elements of the typewriter structure may be obtained in order to produce a desired relation between the typing of several successive lines which may be typed at different space graduations between the type.

The star wheel 8 may be constructed to provide for an escapement of standard proportion as now used in typewriters which will permit of a step by step movement under the normal operation of the escapement mechanism and the star wheel so that the carrier will move the same as the carriage of the standard typewriter or in accordance with the standard step by step movement for producing standard type spacing within a line of type in a typewriter structure.

The operation then, of the knob 67 and the graduating members 47 will produce a graduated movement in predetermined ratio of the actuated member 43 at right angles to the carrier and the corresponding movement of the carriage 5 in the same direction as the carrier which will be equal to, greater, or less, as the adjustment of the graduating member is set to permit or graduate the spacing of the type in a line either equal to, greater than or less than the standard type spacing of the typewriter as now constructed and used.

In producing a greater space than the standard space and a correspondingly fewer number of characters per line than a standard typewriter, the carriage will move a greater distance for each step than the carrier 3, while on the other hand, where the type spacing is graduated to a smaller amount than standard spacing, the carriage will move a smaller distance for each stepped motion than the carrier 3, so that a correspondingly greater number of characters can be incorporated in the same line of type than the standard number of characters for which typewriters are now ordinarily constructed.

This graduation of spacing results entirely from the relation of the movement of the carrier 3, the graduating member 47, and the actuated member 43 which correspond to a right triangle structure wherein the carrier represents one side of the triangle,

the actuated member 43, another side of the triangle, and the graduating member 47 the hypothenuse of the triangle. In one step of movement corresponding to the movement permitted by one tooth of the star wheel, the carrier will move a predetermined distance which will be constant for the entire and continued operation of the typewriter so that one side of the triangle will be of predetermined length for all space graduation of a line of type. The roller 49 moves along the line of the hypothenuse of the triangle for each step of movement of the carrier 3. The remaining side represents the movement of the actuated member 43 which is the graduated spacing of the line of type of the typewriter as produced by the movement of the carriage 5.

It will be seen that by varying the angle between the first mentioned side of the triangle and the hypothenuse that the length of the remaining side will vary with changes in the opposite angles. The change of this angle is effected by the movement of the graduating member 47 through the operation of the worm 57 by the means provided therefor as above described.

In connection with the tabulating mechanism of the typewriter, it is to be understood that for tabulating purposes the usual tabulating mechanism is employed and the stop positioned at the proper point for the tabulating purposes with the standard type spacing of the typewriter. All typewriters are provided with a standard scale over which moves a pointer carried by the carriage to indicate the position of the carriage on the scale, and thereby the remaining number of spaces for a line of type. When the space graduating member is adjusted to produce space graduation in a line of type less or greater than the standard graduation, then it will be understood that the setting of stops of the tabulating mechanism will not correspond exactly with the tabulated space setting of the mechanism for such tabulation. It has been therefore found necessary to place the stop at the standard scale division preceding the point at which the motion of the carriage is designed to be arrested so that the carriage will be engaged and its movement arrested by the stop or the tabulating mechanism upon the depression of the tabulator key at which point the escapement mechanism will not cooperate with the star wheel to prevent further movement of the carriage but upon release of the tabulating mechanism which again releases the carriage to the escapement mechanism a slight further movement will take place which will bring the escapement mechanism into proper cooperation with one of the shoulders of the star wheel and then position the carriage in the desired position for set tabulation. In this way it will be seen that the space graduating mechanism and the standard tabulator cooperates for any tabulating purposes desired, and in view of the well known structure of the standard tabulating mechanism of a typewriter construction it is not believed necessary to illustrate the same in view of the fact that it is believed that a clear understanding can be obtained from the above description.

From the above description, it should now be appreciated that a special relation is provided between the carrier and the carriage which are both movable in the same direction, in which the carrier forms a movable support for the graduating mechanism of the invention which is connected with suitable mechanism movable with the carriage for providing the graduated motion of the carriage to produce graduated spacing.

It is to be further noted that the usual controls for the carriage movement are employed without changing materially the standard construction of the typewriter, but by merely adding special connections therewith for controlling the different functions as above set forth. A special feature resides in the provision of back spacing by the direct operation of the back spacing lever on the star wheel.

The construction illustrated in the drawings is shown on a substantially large scale in comparison with the size of the typewriter, but it is to be understood that the relative proportions can be materially reduced and the entire mechanism incorporated within small compass within the typewriter frame. In this connection, it is desired to call attention to the fact that while the adjustment for the compensating mechanism is provided at the rear of the typewriter as shown in the drawings and in a position which might interfere with the paper feed, that it is entirely within the scope of this invention to operate the shaft 79 by a suitable additional adjusting means operated at the front or side of the typewriter frame the same as the adjusting means provided for operating the graduating member 47.

While this invention is shown and described in its application to a typewriter, it is to be understood that it may be equally as well applied to other forms of printing machines having mechanism operating and controlling the movement of a carriage.

Having thus described our invention, what we claim as new is:—

1. In a typewriter having a movable carriage, a standard uniformly operable escapement mechanism for providing standard type spacing, space graduating mechanism for transmitting the motion of the escapement mechanism to the carriage for controlling movement of the carriage in a predetermined ratio with respect to the escapement mechanism, and compensating means for varying

the relation of the carriage with the space graduating mechanism.

2. In a typewriter having a movable carriage normally operated in one direction, a uniformly operable escapement mechanism, a carrier operably connected with the escapement mechanism for movement with the carriage, and manually controlled space graduating means connected to the carrier having an adjustable ratio changing means and means operable by the ratio changing means connected with the carriage and permitting movement thereof in a predetermined ratio with respect to the carrier.

3. In a typewriter having a carriage normally moved in one direction, an escapement mechanism for controlling movement of the carriage, said mechanism having a predetermined step by step movement, a carrier operable by the escapement mechanism in said step by step movement in the same direction as the carriage, a manually adjustable space graduating means having portions mounted on and movable with said carrier for changing the movement of the carriage in a predetermined ratio relative to the escapement, including a graduating arm mounted on the carrier, an operated means connected with the space graduating arm and movable in relative angular relation to the carrier and carriage, and motion transmitting means connecting the operated means with the carriage.

4. In a typewriter having a carriage, normally operated in one direction, and escapement mechanism controlling movement of the carriage, a carrier mounted independently of and movable with the carriage and connected for direct movement with the escapement mechanism, and space graduating means providing an adjustable connection between the carrier and carriage and carried by the former for controlling the movement of the carriage in a predetermined ratio with respect to the escapement.

5. In a typewriter having a carriage normally operated in one direction, an escapement mechanism, a carrier movable in the same direction with the carriage and connected for direct movement with the escapement mechanism, space graduating means providing an adjustable connection between the carrier and carriage controlling the movement of the carriage in a predetermined ratio with respect to the escapement, and a compensating means adjustable to retain a predetermined relation between the carriage and carrier.

6. In a typewriter having a movable carriage normally operated in one direction, an escapement mechanism, a carrier movable in the same direction as the carriage, a space graduating member movably mounted on the carrier, adjusting means for the space graduating member mounted on the carrier, and actuated means for transmitting motion from the graduating member to the carriage in a predetermined ratio.

7. In a typewriter having a movable carriage, normally operated in one direction, an escapement mechanism, a carrier movable in the same direction as the carriage, a space graduating mechanism connected to the carrier, including an actuated means for transmitting motion in a predetermined proportion to the carriage, and compensating means carried by the actuated means for adjusting the relation between the carriage and carrier.

8. In a typewriter having a movable carriage normally operated in one direction, an escapement mechanism, a carrier operable in the same direction as the carriage, a space graduating mechanism connected to the carrier having means adjustable relative thereto, said means including an actuated means for transmitting motion to the carriage, and a compensating means adjustable on the actuated means of the graduating mechanism for transmitting motion from the actuated means of the graduating mechanism to adjust the relation between the carrier and carriage.

9. In a device of the character described, a movable carriage, a mechanism for controlling movement of the carriage, an independently mounted carrier operated by said mechanism and movable in the same direction as the carriage, and space graduating means connected to the carriage and the carrier mounted for movement with the latter controlling movement of the carriage to produce a predetermined ratio of movement between said carrier and carriage.

10. In a typewriter having a movable carriage normally operated in one direction, a uniformly operable escapement mechanism, a carrier mounted independently of the carriage and operatively connected with the escapement mechanism for movement with the carriage, and manually controlled means connected to the carrier and having connection with the carriage for permitting movement thereof relative to the carrier in a predetermined proportion.

11. In combination, a typewriter having a carriage normally operated in one direction, adjustable mechanism for graduating character spacing, and means to change the position of the carriage relative to the adjustable mechanism for the vertical alinement of printed characters when the carriage has a different extent of letter space movement for each character printed.

12. In a typewriter having a movable carriage normally operated in one direction, a uniformly operable escapement mechanism, means mounted independently of the carriage for movement therewith operably connected with the escapement mechanism, and means connecting the last named means and the carriage operable to permit a movement of the

carriage in a predetermined proportion with respect to the first mentioned means and in the same direction.

13. A register for typewriter space graduating apparatus comprising a plate number formed with a series of appropriately designated indicia representing character spacing in a line of typing of predetermined length and secondary means adapted to register the number of characters printed in a predetermined space, varying in number from that printed in standard spacing by said apparatus.

14. A register for space graduating attachments of typewriters comprising a plate having one series of appropriately designated indicia indicating character spacing for a line of predetermined length, and a plurality of independent series of appropriately designated indicia indicative of character spacing in predetermined spaces less than the length of said line.

In testimony whereof we affix our signatures.

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