May 28, 1940. R. S. REID 2,202,565

TYPEWRITER

Filed Aug. 7, 1937 4 Sheets-Sheet 1

FIG. 1.

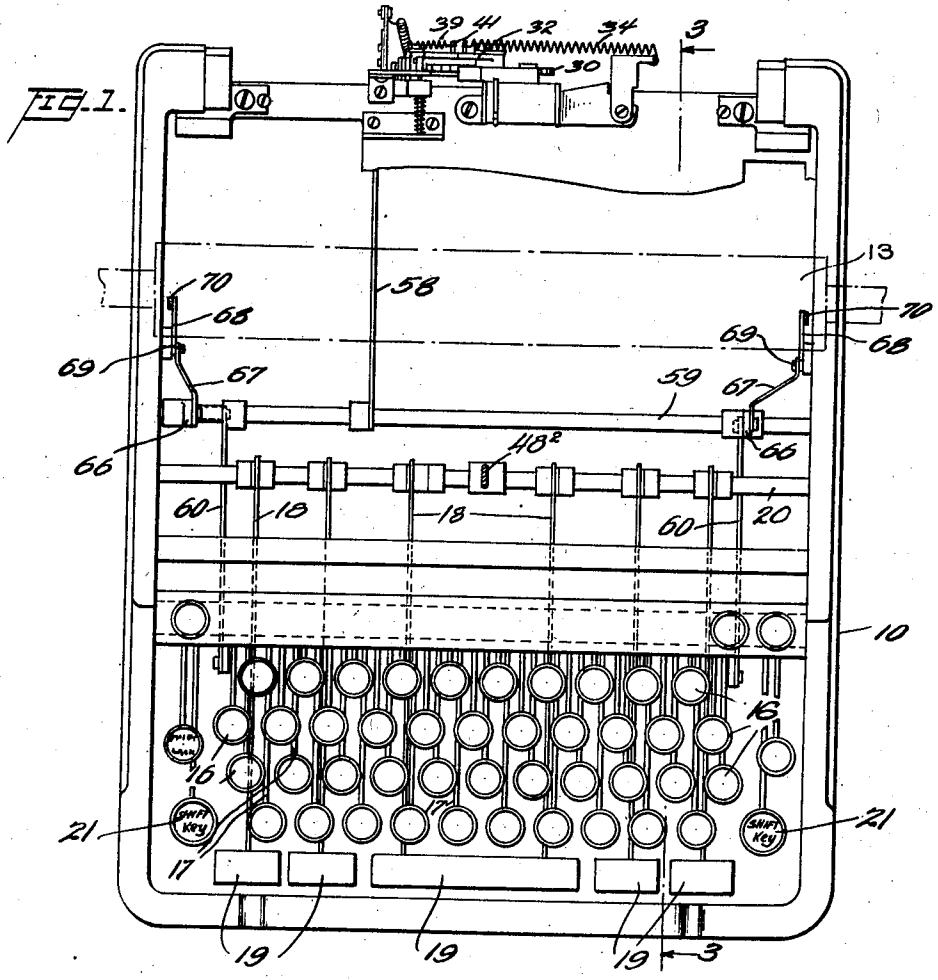


FIG. 12.

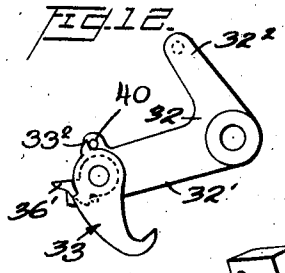


FIG. 13.

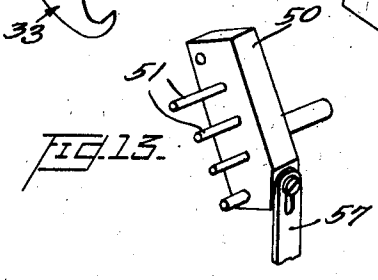


FIG. 14.

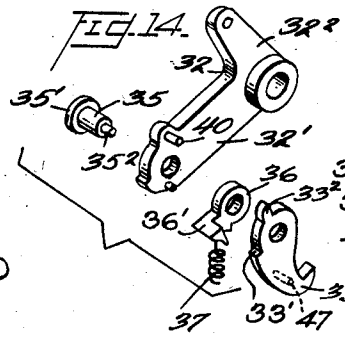


FIG. 15.

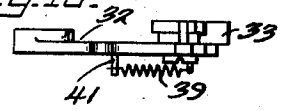
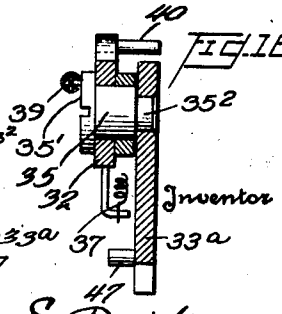


FIG. 16.



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TYPEWRITER

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FIG. 2.

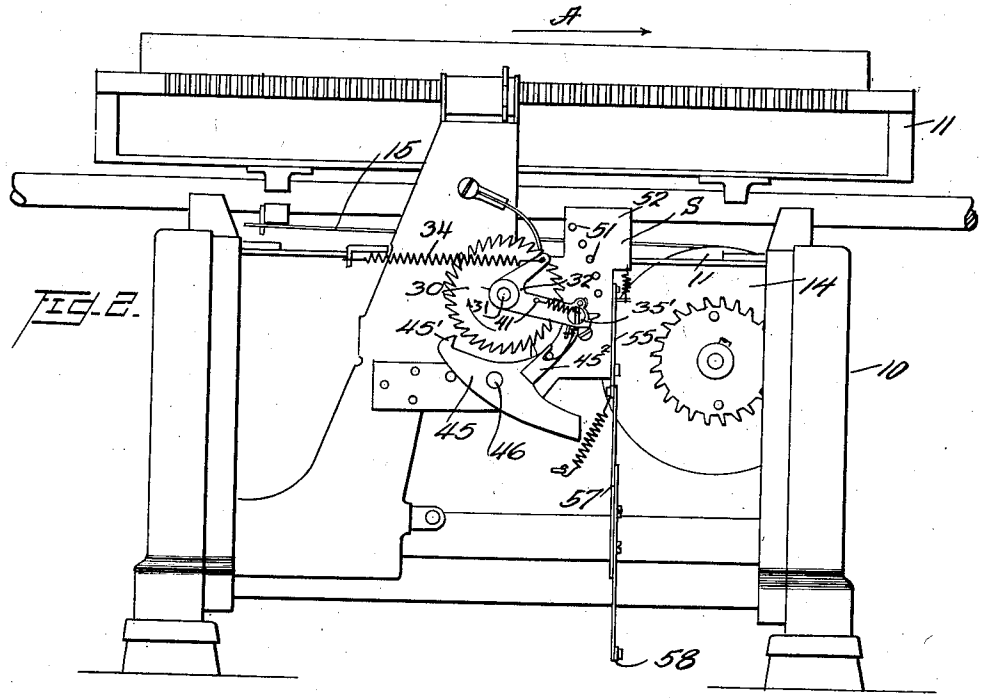


FIG. 5.

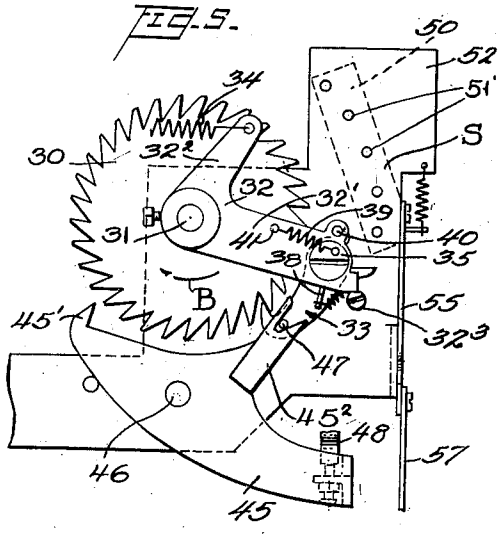
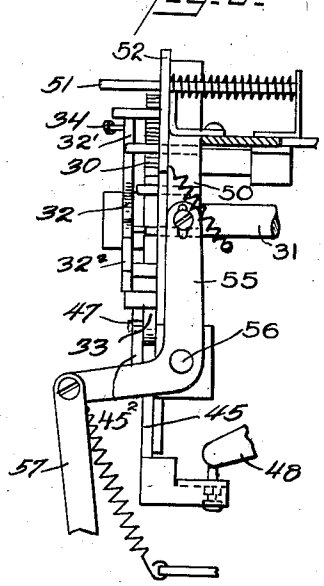


FIG. 6.



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TYPEWRITER

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FIG. 3.

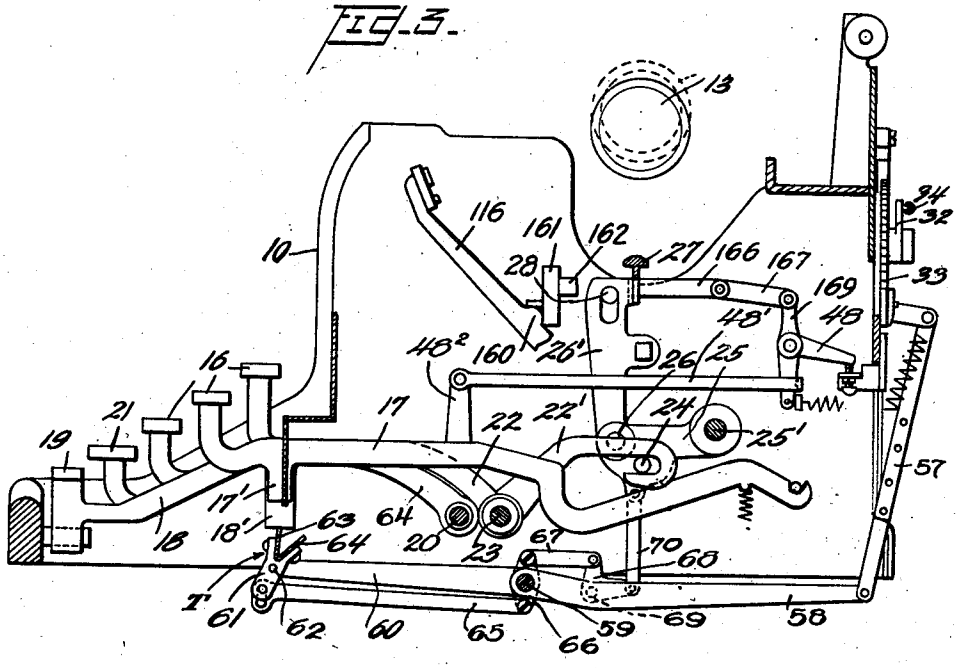


FIG. 10.

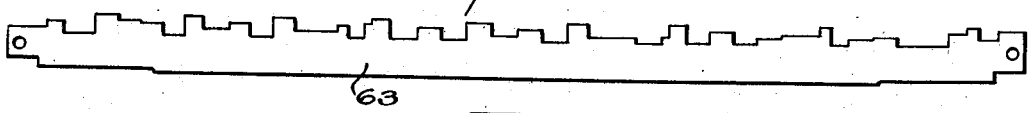
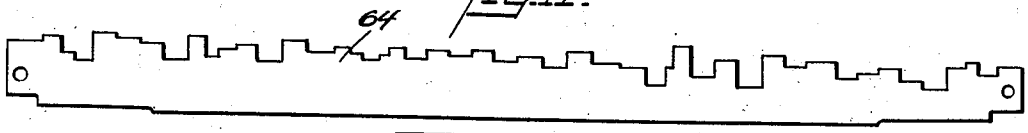


FIG. 11.



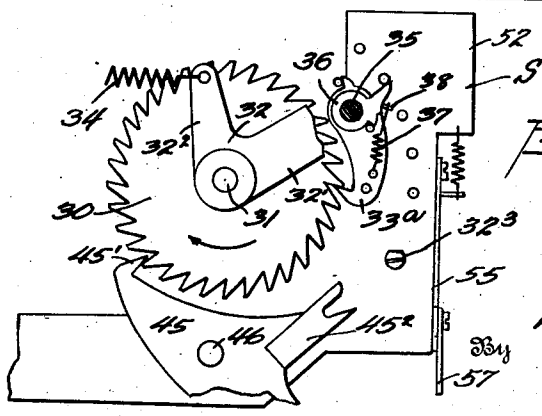


FIG. 8.

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TYPEWRITER

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FIG. 4.

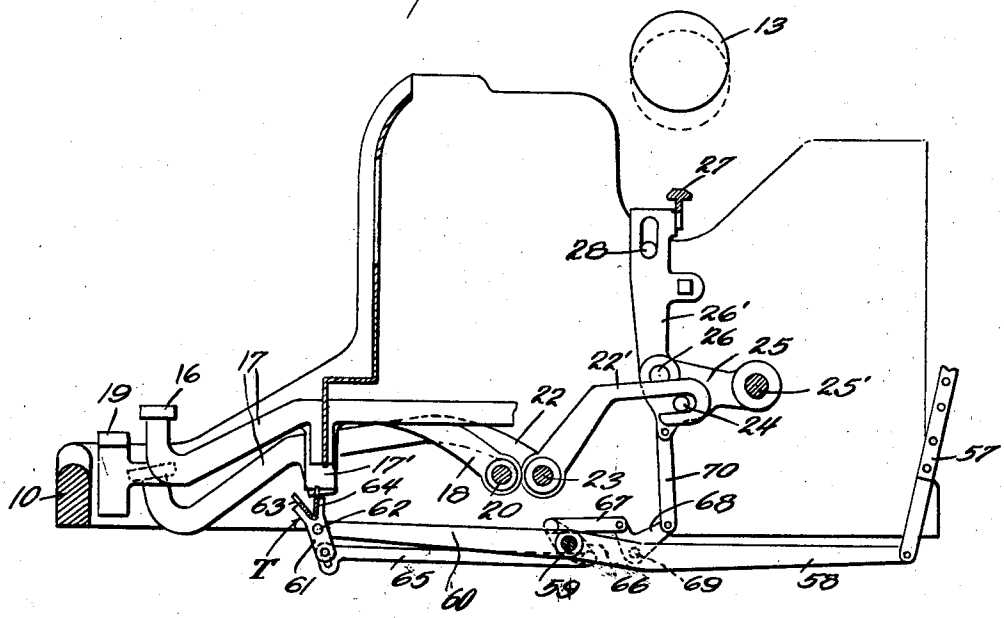


FIG. 7.

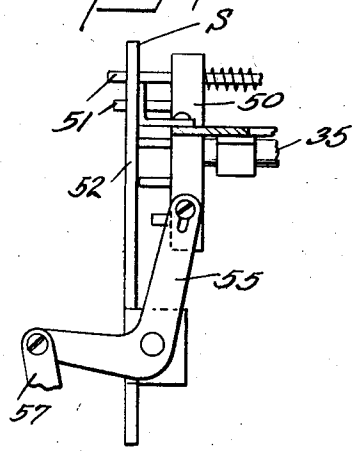
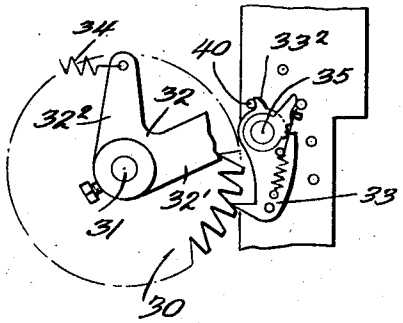


FIG. 9.



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Patented May 28, 1940 2,202,565

UNITED STATES PATENT OFFICE

2,202,565

TYPEWRITER

Roswell S. Reid, Morgantown, W. Va., assignor to West Virginia Newspaper Publishing Company, Morgantown, W. Va., a corporation of West Virginia

Application August 7, 1937, Serial No. 157,964

10 Claims. (Cl. 197—84)

The present invention relates to typewriters, and particularly to typewriters provided with mechanisms of the type heretofore generally designated variable spacing mechanisms.

The ordinary typewriter now in widespread use is so designed and constructed that each printed letter occupies the same space, measured longitudinally of the printed line, no distinction being made between wide and narrow letters, the wide letters being necessarily crowded or condensed and each of the relatively narrow letters occupying what appears to be an excessive amount of space. This follows from the fact that, despite variations in width of the various letters from the widest of the capital letters to the narrowest of the small letters, the travel of the typewriter carriage is in equal increments and the printing mechanism is so designed that each letter is impressed on the paper with its center equidistantly spaced from the centers of the preceding and subsequent letters. As a result a completed typewritten line varies substantially in appearance from a printed line, a line printed from a previously set up group of printer's type having the letters therein equidistantly spaced apart, i. e., the distances between the letters are equal.

It has heretofore been proposed that, by modifying the construction of the conventional typewriter in such manner that the carriage thereof is caused to move forwardly after each actuation of a type bar, a distance proportional to the width of the letter just printed instead of uniform or identical distances, that the final appearance of a typewritten line might be caused to be indistinguishable from that of a printed line, at least insofar as the spacing of the letters therein is concerned. While various mechanisms of this general type have been suggested none has, for various reasons, been actually made commercially available. It is the purpose of the present invention to provide a typewriter of entirely practical nature whereby, by means of a variable spacing mechanism of simple type, rugged construction and low cost, the desired result can be obtained. The improved typewriting machine will be found particularly useful where it is desired to form typewritten sheets for subsequent use in a process of printing which involves the transfer by a photographic step of the material as typewritten from the paper sheet to an element to be substantially used in the printing operation.

The machine embodies, in combination with the usual type bars and longitudinally movable paper holding carriage, mechanism which is responsive to the actuation of the type bars for effecting advancement of the carriage variable distances, the distance advanced by the carriage after the actuation of any type bar being proportionable to the width of the letter imprinted on the paper sheet. It will be understood, of course, that the type elements are not affixed to the type carrying bars in the conventional manner now employed in typewriter manufacture, i. e., so that the various type elements are centered upon the type carrying bars, but on the other hand are so arranged that the left-hand edge of each letter would strike the paper at the same identical point if the carriage were not moved between impressions.

While the type which comprise a font of printer's type have many different widths they may be classified, according to width, into five principal groups, ranging from a relatively small group including a few of the wider capital letters to a group of the narrowest small letters. All of the letters of the font may be allocated to one or the other of these five groups. The present invention contemplates a variable spacing mechanism whereby the travel of the carriage is so automatically regulated that it will advance, after actuation of the type bar, a distance corresponding to the group in which the letter just printed is classified, the advance of the carriage after the printing of a larger capital letter being five times as great as the advance after the printing of one of the smallest letters, the desired spacing of the letters in the printed line being thereby obtained. The invention further contemplates the subdivision of the usual spacing bar into five units and the variable spacing mechanism is likewise actuated by any one of these five units to bring about variable spacing between words or letters. By the proper selection of spacing keys the typed line may be adequately justified, thus further increasing the ability of the operator to provide typewritten matter which is indistinguishable from printed matter.

In adapting the invention to a conventional typewriter but few alterations or modifications of the conventional typewriter structure are found to be necessary. The escapement mechanism is slightly modified and a novel escapement controlling device in the nature of a templet or gauge is positioned adjacent the typewriter key bars, this templet device being in the line of travel of all of the key bars and being so connected to the escapement mechanism that the actuation of a key bar results in actuation of the escapement. The templet device, however, is so designed and

constructed that it will be actuated different distances upon the depression of different key bars, having a stepped or uneven surface so that the various key bars will strike the templet device after travelling different distances, to effect different movements of the templet device and thus effect, by modification of the action of the escapement, varying travel of the carriage. The templet device is so designed and constructed that it may be adjusted to function when either capital or small letters are being printed and the shift mechanism is connected thereto so that, when the shift key is operated, an adjustment is simultaneously made in the position of the templet device. By adjusting the position of the templet device the variable stop mechanism may be controlled so that the advancing movement of the carriage is automatically regulated to properly space both large and small letters, also the customary figures and symbols involved in the usual typewriter keyboard.

In the accompanying drawings a preferred embodiment of the invention is illustrated but it will be appreciated by one skilled in the art that, without departure from the invention, the design and arrangement of its various elements may be very considerably modified, particularly in adapting the invention to typewriters of various makes and designs. It will be understood also that, in the accompanying drawings, many conventional portions of a typewriter have been omitted in order that the novel features of the invention may be more clearly perceived.

Figure 1 is a plan view of a portion of a typewriter showing the frame and keyboard, certain elements of the variable spacing mechanism being shown in plan;

Figure 2 is a rear elevation of the same typewriter, showing the major elements of the carriage controlling mechanism;

Figure 3 is a section on line 3—3 of Figure 1;

Figure 4 is a similar section but showing certain parts of the mechanism in different positions;

Figure 5 is an enlarged elevation of the escapement mechanism;

Figure 6 is a side elevation of the escapement mechanism;

Figure 7 is a similar view showing portions of the mechanism in different positions;

Figures 8 and 9 are additional views, in elevation, of the escapement mechanism showing the operating parts in different positions;

Figures 10 and 11 are elevations of the main elements of the templet device respectively;

Figure 12 is a side elevation of a portion of the escapement mechanism;

Figure 13 is a perspective view of one of the elements of the variable stop mechanism;

Figure 14 shows in disassembled relationship the several elements of the escapement mechanism shown in Figure 12;

Figure 15 is a top plan view of the mechanism shown in Figure 12; and

Figure 16 is a section on line 16—16 of Figure 15.

The frame of the typewriter is indicated at 10 and it will be understood that this frame may be of any suitable or conventional type. The carriage is rather diagrammatically illustrated at 11 in Figure 2, the platen being indicated at 13 in Figures 1, 3 and 4. It will be understood that the carriage is mounted for movement in a direction parallel to the longitudinal axis of the platen 13 and that, after the actuation of a type bar, the carriage will be advanced in the direction of the arrow A in Figure 2 by any ordinary or usual tensioning device, such as diagrammatically indicated at 14, this device being connected to the carriage by means of a strap or tape 15.

Keys are indicated at 16 and key bars at 17, these key bars and the type bars which they actuate being of conventional form. It is essential, however, that each key bar have a downwardly extending portion 17' which is adapted to contact, when the key bar is depressed, with the templet device generally indicated at T. Spacer bars are indicated at 18, each spacer bar having a spacer key 19 mounted on its outer end and having its inner end rotatably mounted on transverse shaft 20, the central spacer key 19 being longer than the other four and being mounted upon the two central spacer bars 18 which will move simultaneously when the central key 19 is depressed. Each spacer bar 18 has a downwardly extending portion 18' comparable in every way with the corresponding portions 17' of the key bars, and adapted to contact with the templet device to cause it to operate the spacing mechanism for variable distances as will be described in considerable detail in connection with the key bars 17. One of the two shift keys is indicated at 21 and a shift key bar at 22, this key bar being mounted upon the transverse shaft 23 and having an extension 22' which is horizontally slotted to receive a pin 24 fixed upon a rocker 25 rotatably supported on shaft 25'.

To rocker 25 is pivotally connected as at 26 the lower end of a vertically movable slide 26' upon the upper end of which is mounted the carriage supporting rail 27, the slide being guided in its vertical movements by means of a stationary pin 28. It will be understood that, upon depression of the shift key, the rail 27 will be elevated through the intermediate mechanism just described, to raise the carriage and the platen supported thereon from the position in which it is shown in full lines in Figure 3 to its dotted line position. It is by the shift mechanism that the platen is adjusted for the printing of capitals, small letters and figures, in the customary manner. The shift mechanism thus described is of conventional type.

At the rear of the machine is an escapement mechanism of the pawl and ratchet type. This escapement mechanism comprises the escapement ratchet 30, fixed on shaft 31, which shaft is operatively connected by the usual gearing to the typewriter carriage 11 so that the ratchet 30 is constantly urged to rotate in the direction of the arrow B, Figure 5, by the carriage advancing means. Associated with the escapement ratchet 30 is mechanism for releasing this ratchet to permit the same to rotate and hence permit advancement of the carriage in the direction of the arrow A, Figure 2, and for stopping such rotation after a predetermined angular travel, and thus halting the movement of the carriage. This mechanism will now be described.

Mounted for free rotation on the end of shaft 31 is a member 32 having two angularly disposed arms 32' and 32^2 the first of which carries at its outer end a pawl 33 arranged in the plane of the ratchet, and the second arm 32^2 having attached to its outer end one end of a spring 34 the opposite end of which is attached to the frame by any suitable means, the spring being normally in tension and tending to rotate member 32 in a counterclockwise direction about the axis of shaft 31 (Figure 5) or opposite to the direction in which the ratchet wheel 30 rotates when released.

The pawl device 33 comprises a hooked ratchet engaging element 33a and a resiliently attached dog or striking element 36, and is secured to the arm 32' as described below. Rotatably mounted in a cylindrical aperture formed in the end of arm 32' is a stud 35 having an enlarged head 35' and a reduced axial portion 35^2 upon which the ratchet engaging element 33a is non-rotatably fixed. Intermediate arm 32' and element 33a and rotatably mounted upon stud 35 is the stop engaging portion or dog 36 having a lateral extension 36' projecting across the plane of the ratchet engaging element and the lower edge of which is adapted to rest upon a shoulder 33' of the element 33a. A spring 37 connects the dog 36 to an arm 38 projecting from the pawl carrying arm 32', maintains it normally in contact with the shoulder 33' of the element 33a, for all positions of the latter, but permits it to rock upwardly to disengage the shoulder 33' for a purpose to be hereinafter explained. The pawl itself is normally maintained by means of a spring 39 in the position (with respect to the pawl carrying arm 32') in which it is shown in Figure 12, with a projection 33^2 seated against a pin 40 secured to the pawl carrying arm 32', this spring having one end attached to arm 32' by means of pin 41 and the other end connected to the head 35' of stud 35 at a point spaced from the axis thereof, which stud, as has previously been explained, is rotatably mounted in arm 32'.

An escapement lever is indicated at 45, this lever being mounted for rocking movement upon a pin 46 rigid with the frame. One end of lever 45 carries a tooth 45' adapted to engage one or the other of the teeth of the ratchet wheel 30 and to lock the ratchet wheel against rotation. The escapement lever likewise carries an arm 45^2 the outer end of which is notched to receive a pin 47 carried by the pawl 33, member 45^2 comprising means for disengaging pawl 33 from ratchet 30 when lever 45 is rocked in a clockwise direction. Clockwise movement of pawl carrying arm 32' is limited by stop pin 32^3. The escapement lever 45 is actuated in a clockwise direction of rotation about pivot 46 by mechanism which includes the lever 48 and the means which operatively connects lever 48 to the several key bars, including link 48' and arm 48^2 the lower end of which is fixed upon rotatable shaft 20, to which the spacer key bars are secured, and by other mechanism of more or less conventional type which operatively connects the key bars to lever 48. Upon the actuation of a character key 16 the type bar 116 (Figure 13) will be moved toward the platen 13 and during such movement the cam 160 formed on the type bar 116 will engage a portion of the arcuate member 161 of the sliding frame 162 adapted to move longitudinally of the typewriter frame. This sliding frame 162 may be guided in its sliding movement by any suitable means, such, for example, as shown in my copending application Serial No. 168,494. The sliding member 162 is provided with a rearwardly projecting portion 166 which is connected by means of a link 167 with an arm 169 of the bell crank 48. It will be seen that when any one of the key bars 17 is depressed, lever 48 will be also actuated to depress the lower end of the escapement lever, thus causing the detent 45' of this lever to engage one or another of the notches of the teeth of the escapement ratchet, to lock the ratchet against rotation, the arm 45^2 being at the same time swung away from the escapement ratchet and carrying the pawl pin 47 with it to effect disengagement of the pawl from the ratchet.

A graduated stop mechanism is indicated generally at S this mechanism comprising a stop block 50 carrying a plurality of stop pins or elements 51 disposed in parallelism and equidistantly spaced apart on the arc of a circle the center of which is coincident with the axis of shaft 31. The block 50 is mounted upon suitable supporting means for limited movement in a direction parallel to the axis of shaft 31, toward and away from a plate 52 secured to the frame and positioned parallel to and just in rear of the ratchet wheel 30. It will be observed from Figures 6 and 7 that the stop elements 51 which are rigidly secured to the stop block 50 and are adapted to move through apertures formed in plate 52 are of graduated length, the lowermost being relatively short and the uppermost longest. The last or uppermost stop element, which need not move, is not rigid with block 50 but extends through an aperture formed in this block and a corresponding aperture in plate 52 and is so attached to the frame structure that it remains in fixed position. Means is provided for adjusting the position of the stop carrying block 50 to withdraw either the first of the stop elements 51 to the rear of the face of plate 52, or to withdraw the first and second stop elements, or the first, second and third of these elements, as shown in Figure 7, or the first four elements, if desired, leaving only the fifth or uppermost or stationary stop pin in its original position.

With the several stop pins in the positions in which they are shown in Figure 6, the lowermost pin projects sufficiently far in advance of plate 52 to lie in the path of the stop engaging dog 36 which is a part of the pawl 33 and moves with the pawl carrying arm 32'. Hence, after the pawl is released from the ratchet wheel and is carried upwardly by arm 32' under the influence of spring 34, its movement will be uninterrupted until the stop engaging portion or dog 36 engages one or another of the stop pins or elements 51, spring 39 maintaining the toothed lower end of the pawl out of contact with the teeth of ratchet 30 during such movement. As soon, however, as the stop engaging dog 36 strikes the lowermost projecting stop element 51, which lies in its path, it, by reason of the fact that it bears upon shoulder 33' of pawl element 33a, causes pawl 33 to rock in a clockwise direction around the axis of the stud 35 and against the tension of spring 39 until its toothed end enters the space between two of the ratchet teeth. If the stop carrying block 50 is moved to the right (Figure 7) until the first three stop elements 51 are withdrawn in rear of plate 52, the pawl 33 will continue its upward movement until the fourth or uppermost of the movable pins 51 is engaged by the stop engaging portion whereupon the pawl 33 is rocked into interlocking engagement with the ratchet wheel but, as is obvious, after a substantially longer travel of the pawl than in the case first described.

It is clear that by manipulation of the stop carrying block 50 the angular travel of the pawl, upon its release from the ratchet wheel, may be regulated. Inasmuch as the ratchet wheel and pawl move together, upon the return stroke of the pawl, until the arm 32' carrying the pawl strikes the stop pin 32^3, it is clear that the length of the arc of upward travel of the pawl determines the extent of angular rotation of the ratchet wheel when the pawl returns to the ini-

tial position, thus determining the extent of advancing movement of the carriage. Hence by proper manipulation of stop carrying block **50** the carriage may be allowed to advance after a printing operation, either one, two, three, four or five spaces.

As already described, the spring **37**, cooperating with the spring **39** which acts on the ratchet engaging element **33***a* itself, is adapted to continuously urge the dog member **36** and the element **33***a* toward each other so that the element **36** abuts the shoulder **33'** on the element **33***a*, but this resilient connection permits the separation of the elements **33***a* and **36** of the pawl device **33**, and permits the former to rock upwardly away from the shoulder **33'**, and thus to yield in the event that it should strike any obstructions during the downward movement of the pawl device. If this resilient yielding were not provided for, and any of the lower stop elements **51** had returned to their projected positions, the pawl element might accidentally become disengaged from the tooth on the ratchet wheel.

Stop carrying block **50** is automatically positioned to a position which corresponds to the actual width of any letter printed by mechanism which connects this stop block to the templet device T, previously referred to, and which is positioned adjacent the key bar **17** and the spacer bars **18**. Thus to the stop block is operatively connected one arm of a bell crank lever **55** which is pivoted at **56** to the frame upon which the escapement mechanism is mounted. The lower arm of bell crank lever **55** is connected by means of an adjustable link **57** to the end of lever **58** which extends rearwardly from and is fixedly secured to a cross rod **59** the ends of which are rotatably supported in the side frame members of the machine. Also fixed upon the rotatable cross rod **59**, and extending forwardly of the machine or toward the keys **16**, are two parallel arms **60**. Mounted upon the extreme forward end of each arm **60** is a plate **61**, each plate being connected to the adjacent arm by means of a pivot **62**, about which the plate may rock.

Templet members **63** and **64** extending transversely of the typewriter and disposed in intersecting planes have their ends carried by the rocking plates **61**. These templet members are more particularly disclosed in Figures 10 and 11 and it will be seen that each comprises an elongated bar with a stepped or serrated upper edge. Plate **61** may be rocked to bring either one or the other of the templet plates **63** or **64** into a substantially vertical plane and directly under the downwardly extending projections **17'** of the key bars **17** and the corresponding projections **18'** of the spacer bars **18**. The templet **63** is positioned in the position in which it is shown in Figure 3, to be engaged by key bar projections **17'**, when one set of characters, for instance, small letters, are to be printed, and the templet bar **64** is swung into this position and bar **63** out of position, when another set of characters are to be printed, for instance, capital letters. The means for rocking plates **61** and hence bringing one or the other of the templet bars into operative position comprises a link **65** connecting the lower end of plate **61** to the lower end of a rocker **66** pivotally mounted upon the cross rod **59**, the upper end of rocker **66** being connected by a link **67** to one arm of a bell crank lever **68** pivotally supported at **69** upon the frame of the machine, the other arm of bell crank lever **68** being connected by means of a link **70** with the rocker **25** comprising portion of the shift mechanism previously described. Hence when a shift key is depressed the platen **13** will not only be changed in position but the templet **64** for capital letters will be swung into operative position beneath the key bar projections **17'**. Such position of the various members just described is illustrated in Figure 4.

One or the other of the templet bars **63** or **64**, depending upon whether capital or small letters are being printed, will always underlie the key bar projections **17'** as aforesaid. Depression of a key bar will cause the projection **17'** thereof to move downwardly until the lower end of this extension **17'** has contacted the templet bar underlying the same and has moved the bar downwardly also. The extent of downward movement of the templet is determined by the distance which the key bar projection **17'** must travel before striking the bar since the extent of downward movement of each key bar upon depression thereof for the purpose of printing a letter is the same as the downward movement of all other key bars when depressed. The upper edges of the templet bar **63** and **64** are so shaped that, when a key bar **17** is depressed for the purpose of printing a very narrow letter, its projection **17'** will enter one of the deepest notches formed in the bar, the depth of this notch being such that no downward movement of the templet results. Hence there will be no movement of levers **60**, **58**, link **57** or carrier block **50**. Therefore, upon the immediate subsequent operation of the pawl and ratchet mechanism, the pawl carrying arm **32'** will only move from its initial position upwardly a minimum distance, or until the stop engaging dog **36** engages the lowermost stop element **51**. As the result the carriage will be advanced the minimum distance, which distance, however, is ample for the narrow letter printed.

Should a key bar corresponding to a wider letter be depressed, however, the projection **17'** will not enter any one of the deepest notches in the templet bar but will come in contact with this bar at a point sufficiently early in its travel to cause a depression of the bar and hence to cause withdrawal of the stop carrying block **50** until one or more of the stop elements **51** are withdrawn in rear of plate **52**, depending upon the width of the letter being printed. Hence the pawl **33** will have an increased arc of travel, the ratchet wheel **30** will rotate through a greater angle, and the carriage will be allowed to advance through a greater distance than before, or through a distance necessary to effect the proper spacing of the letter printed from that which is to be subsequently printed. As has previously been explained, the letters of a font of type may be arranged in five groups in accordance with their widths. In forming each of the templet bars, therefore, a deep notch is cut for a letter of narrowest width, a shallower notch for a letter of slightly greater width, and so on, the deepest notches being adapted to receive the projections **17'** of the key levers controlling the printing of the smallest letters. The same is true in the case of the templet **64**, employed for the printing of capital letters.

Each of the five spacer bar extensions **18'** is disposed above notches of different depths in the templet bars and will actuate the escapement through correspondingly different distances exactly as described in connection with the key bars **17** and end extensions **17'**.

The mechanism is entirely automatic in character and the typewriter may be operated rap-

idly to produce type-written matter indistinguishable from printed matter insofar as spacing of the letters is concerned. This typewritten matter is entirely suitable for use in the method of printing commonly known as offset printing and which method involves a photographic step. It also presents a superior appearance when used for any other purpose.

It will be appreciated by one skilled in the art that the invention may be readily made use of in double shift typewriters by providing three, instead of two, templet bars. Also, that the type used may be divided into four, or more than five groups and the number of escapement stops changed accordingly. Without departure from the invention, likewise, the design and arrangement of its component elements may be considerably changed or modified, particularly in adapting the invention to typewriters of various types.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A typewriter comprising the combination with a carriage, means tending to advance the carriage, key bars, and type of various widths, of mechanism for releasing the carriage after printing of a letter and thereafter stopping the same after it has travelled a distance corresponding to the width of the letter printed, said mechanism including a carriage operated escapement ratchet wheel, a pawl normally engaging the ratchet wheel, means for releasing said pawl, means for moving the pawl, when released, about the periphery of the ratchet, a variable stop means separate from said pawl releasing means for both limiting the movement of the pawl when released and causing the pawl to re-engage the ratchet, and key lever actuated means for automatically adjusting the position of said variable stop means.

2. A variable stop mechanism for a typewriter of the class described, comprising the combination with a carriage operated escapement ratchet, pawl and detent elements adapted to cooperate in permitting the ratchet to advance with a step-by-step motion, means for determining the extent of ratchet and carriage advance after the printing of a letter, said means including a plurality of spaced pins, and means for shifting said pins to cause one or the other of said pins to be positioned directly in the path of said pawl to limit the travel thereof relatively to the ratchet, said last named means including a horizontal bar disposed betneath the keys in the descending path thereof and operatively connected to said pins, said bar being provided upon its upper edge with notches of various depths into which the respective key bars enter to actuate the bar for distances corresponding with the spaces required for the characters on the keys.

3. A variable stop mechanism for a typewriter of the class described, comprising the combination with a carriage operated escapement ratchet, pawl and detent elements adapted to cooperate in permitting the ratchet to advance with a step-by-step motion, means for determining the extent of ratchet and carriage advance after the printing of a letter, said means including a plurality of pins, disposed equidistantly from each other and normal to the path of movement of the pawl, the ends of said pins being spaced unequal distances from said path, and means for simultaneously actuating the pins to cause the outer ends thereof to be selectively positioned directly in said path, for the purpose set forth, said last named means including a horizontal bar disposed beneath the keys in the descending path thereof and operatively connected to said pins, said bar being upon its upper edge with notches of various depths into which the respective key bars enter to actuate the bar for distances corresponding with the spaces required for the characters on the keys.

4. In a typewriter of the class described, a carriage, means tending to advance the carriage, key bars, and type bars each carrying upper-case and lower-case type of various widths, carriage shift means for changing from lower case to upper case and vice versa, variable escapement mechanism for controlling the forward movement of the carriage under the influence of said first named means, and means for automatically and selectively controlling said variable escapement mechanism including a plurality of substantially horizontal bars disposed beneath the key bars and in the descending paths thereof, and provided with notches of various depths in their upper surfaces, into which the respective key bars are adapted to enter to actuate the control bars the amount corresponding to the width of the characters on the keys, means supporting said control bars for rocking movement to bring one or the other into operative position to effect the proper upper case or lower case spacing, and levers and linkage positively connecting said bars to the carriage shift mechanism for movement when the carriage is shifted.

5. A typewriter comprising the combination with a carriage, means tending to advance the carriage, key bars, and type of various widths, of mechanism for releasing the carriage after printing of a letter and thereafter stopping the same after it has travelled a distance corresponding to the width of the letter printed, said mechanism including a carriage operated escapement ratchet wheel, a pawl device mounted for rotation concentrically with said wheel and adapted to normally engage the same, means continuously urging said pawl device about the periphery of said wheel, a key actuated escapement lever for releasing said pawl device from said ratchet wheel and simultaneously engaging said wheel to prevent immediate rotation thereof, a variable stop means adapted to halt said movement of the pawl device at a further point determined by the setting of the stop means and to reengage said pawl device with said wheel substantially immediately, means for then releasing the escapement lever from engagement with said wheel to permit it to advance and the carriage to move, key lever actuated means for adjusting the position of said variable stop means, and further stop means for limiting the return movement of said pawl device while in engagement with said ratchet wheel.

6. A typewriter comprising the combination with a carriage, means tending to advance the carriage, key bars, and type of various widths, of mechanism for releasing the carriage after printing of a letter and thereafter stopping the same after it has travelled a distance equal to the width of the letter printed, said mechanism including a carriage operated escapement ratchet wheel, a pawl carrying member mounted for rotation about the center of said ratchet wheel, means for continuously urging said carrier in a direction opposite to that of the movement of said wheel, a pawl pivotally mounted on said carrier and normally engaging a tooth of said wheel, means urging said pawl about its pivot in a di-

rection out of engagement with said wheel, means for positively releasing said pawl from engagement with said wheel whereby said carrier may rotate, and for holding said wheel against rotation, variable stop means disposable in the path of movement of said pawl to limit the distance which it moves about the ratchet wheel, an abutment carried by said pawl adapted to strike said stop means and thrust said pawl into engagement with one of the teeth of said wheel at a point determined by the setting of the stop means, means for then releasing the wheel for escapement movement with the pawl in engagement therewith, a fixed stop adapted to be struck by said pawl to limit this return movement, and key lever actuated means for automatically adjusting the position of the stop means.

7. A typewriter comprising the combination with a carriage, means tending to advance the carriage, key bars, and type of various widths, of mechanism for releasing the carriage after printing of a letter and thereafter stopping the same after it has travelled a distance corresponding to the width of the letter printed, said mechanism including a carriage operated escapement ratchet wheel, a pawl member comprising two elements mounted for limited relative movement and for rotation concentrically with said wheel and adapted to normally engage the same, means continuously urging said pawl member about the periphery of said wheel, resilient means continuously urging said elements together toward their limit of relative movement in one direction, a key actuated escapement lever for releasing said pawl member from said ratchet wheel and simultaneously engaging said wheel to prevent immediate rotation thereof, a variable stop means adapted to be contacted by one of said elements to halt said movement of the pawl member at a further point determined by the setting of the stop means and to immediately reengage said member with said wheel, and means for then releasing the escapement lever from engagement with said wheel, to permit it to advance and the carriage to move.

8. A typewriter comprising the combination with a carriage, means tending to advance the carriage, key bars, and type of various widths, of mechanism for releasing the carriage after printing of a letter and thereafter stopping the same after it has travelled a distance corresponding to the width of the letter printed, said mechanism including a carriage operated escapement ratchet wheel, a pawl member comprising two elements mounted for limited movement relative to each other, one element adapted to engage the teeth of the ratchet wheel and the other providing a yieldingly retractable stop abutment, the pawl member being mounted for rotation concentrically with said wheel and adapted to normally engage the same, means continuously urging said pawl member about the periphery of said wheel, means continuously urging said elements together toward one limit of their relative movement, a key actuated escapement lever for releasing said pawl from said ratchet wheel and simultaneously engaging said wheel to prevent immediate rotation thereof, a variable stop means comprising a plurality of elements normally projected into the path of movement of said stop abutment element, but each capable of being selectively withdrawn from said path to determine the extent of movement of said pawl member, the stop element contacted by said pawl member serving to halt the movement of the latter at a further point determined by the setting of the stop means and to immediately reengage said member with said wheel, and then releasing the escapement lever from engagement with said wheel to permit it to advance and the carriage to move, key lever actuated means for adjusting the position of said variable stop means, the yielding mounting of the stop abutment element of the pawl member permitting the movement of the latter past any stop elements which may have resumed their normal projected positions during the return movement of the pawl member, and further stop means for ultimately limiting the return movement of said pawl member in engagement with said ratchet wheel.

9. A typewriter comprising the combination with a carriage, means tending to advance the carriage, key bars, and type of various widths, of mechanism for releasing the carriage after printing of a letter and thereafter stopping the same after it has travelled a distance corresponding to the width of the letter printed, said mechanism including a carriage operated escapement ratchet wheel, a pawl normally engaging the ratchet wheel, means for moving the pawl, when released, about the periphery of the ratchet wheel, variable stop means adapted to be struck by said pawl for limiting the movement of the pawl to distances equivalent to the appropriate movement of the carriage for the type being printed, said variable stop means being itself effective to compel the reengagement of the pawl with the ratchet wheel by reason of the rotation of said pawl about its pivot immediately upon being struck by said pawl, and key lever actuating means for adjusting the position of the variable stop means.

10. A typewriter comprising the combination with a carriage, means tending to advance the carriage, key bars, and type of various widths, of mechanism for releasing the carriage after printing of a letter and thereafter stopping the same after it has travelled a distance corresponding to the width of the letter printed, said mechanism including a carriage operated escapement ratchet wheel, a pawl carrying member movable generally about the periphery of said ratchet wheel, a pawl pivoted on said member and normally engaging said ratchet wheel, means for releasing said pawl from said ratchet wheel when a key is depressed, means for moving said member with respect to the ratchet wheel when said pawl is released, a stop disposable in the path of said pawl to limit the movement of said member and pawl and cause the pawl to swing back into engagement with said ratchet wheel at another point.

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