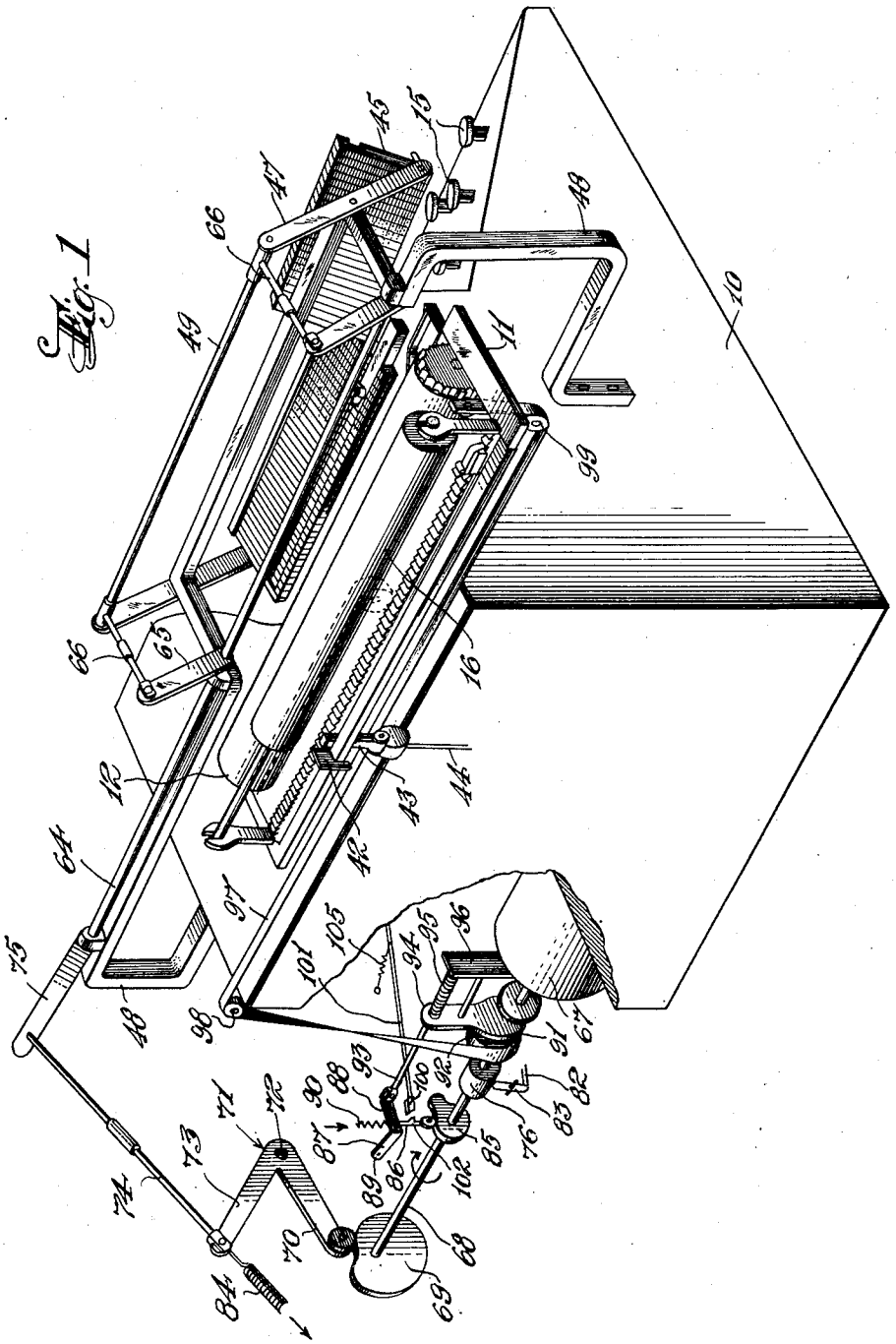
Oct. 24, 1939. J. SPIELVOGEL 2,177,539

ART OF REPRODUCTION

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Fig. 1



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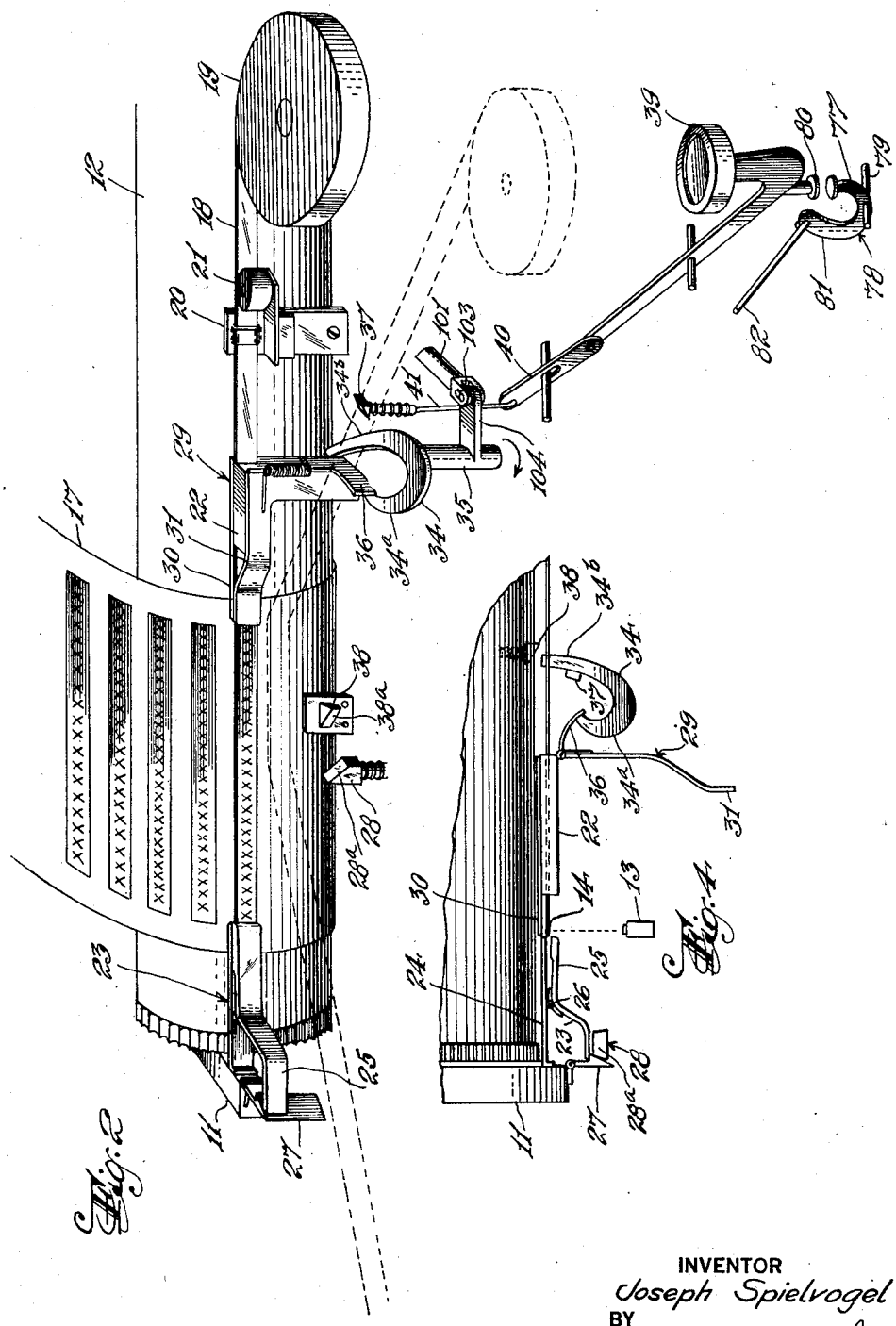


Fig. 2

Fig. 4

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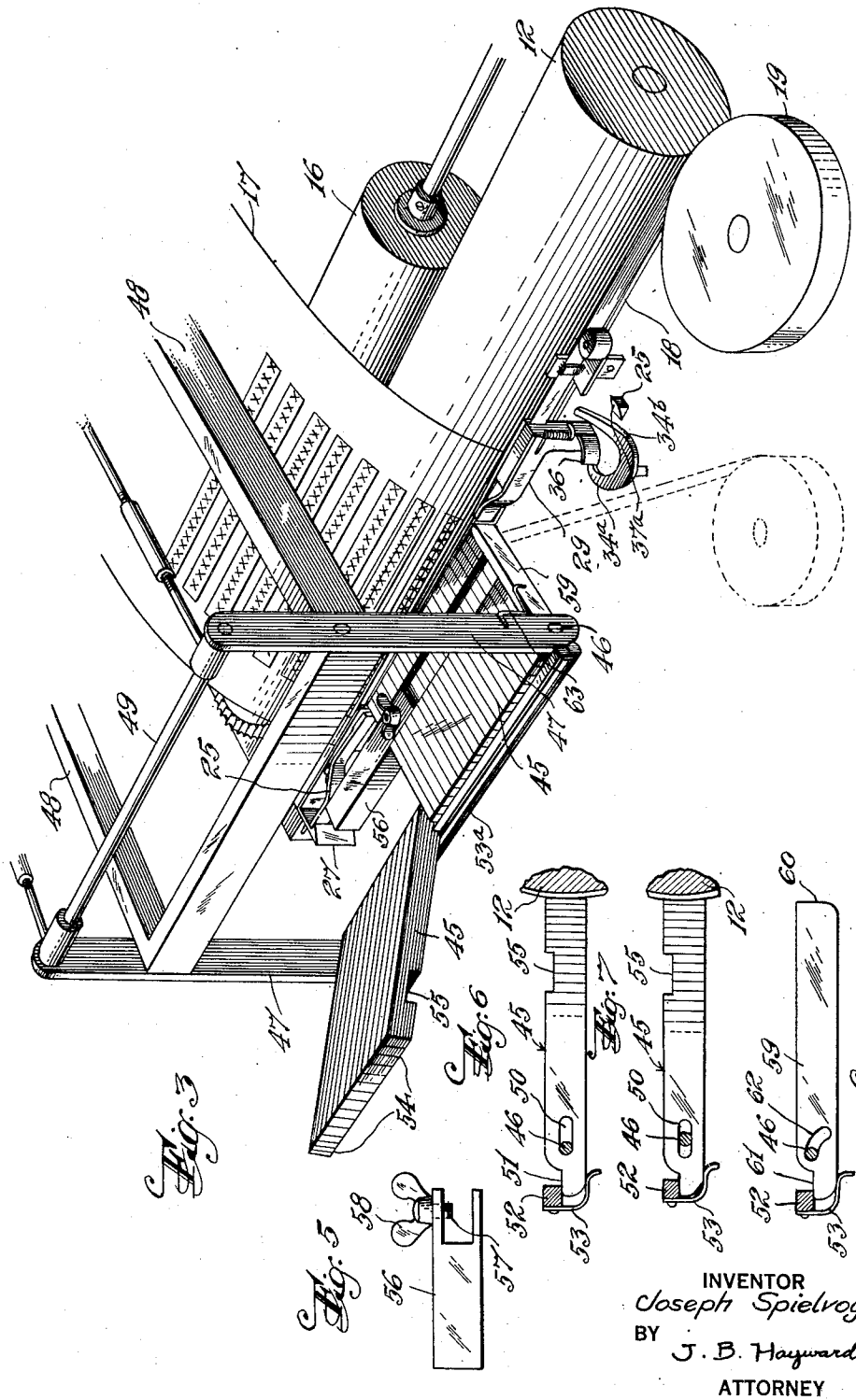


Fig. 3

Fig. 6

Fig. 7

Fig. 8

Fig. 5

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Fig. 9

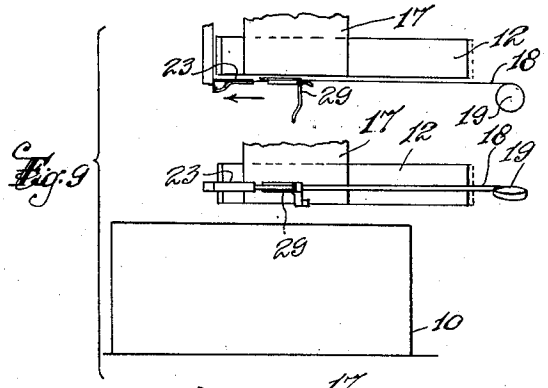


Fig. 11

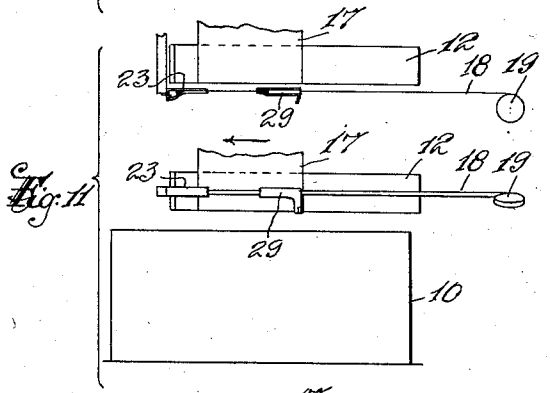


Fig. 13

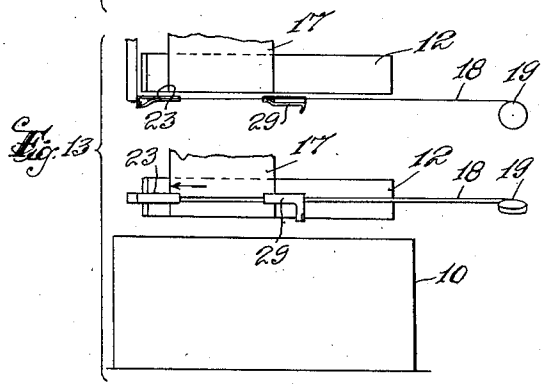


Fig. 15

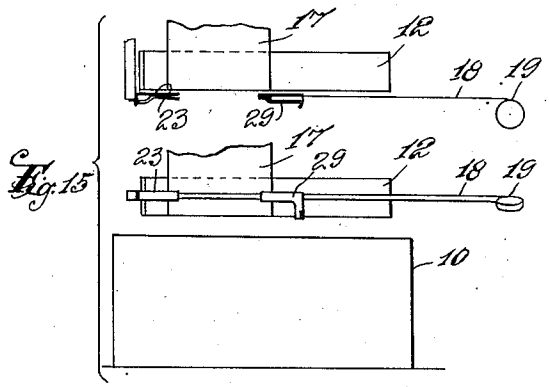


Fig. 10

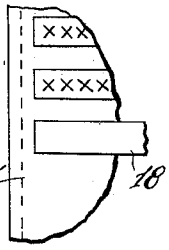


Fig. 17

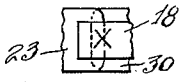
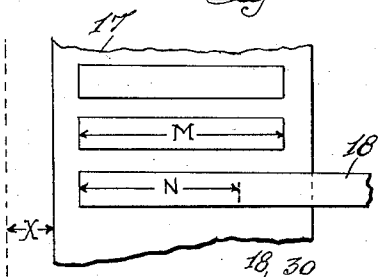


Fig. 12



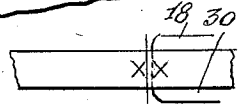


Fig. 18

Fig. 14

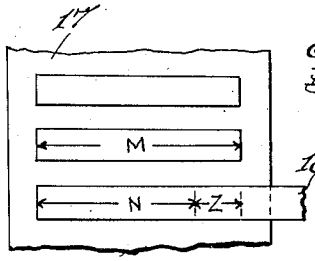
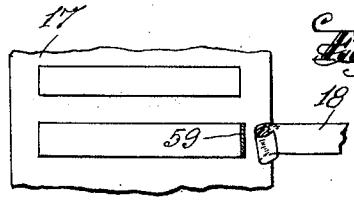


Fig. 16



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UNITED STATES PATENT OFFICE

2,177,539

ART OF REPRODUCTION

Joseph Spielvogel, Newark, N. J.

Application November 2, 1935, Serial No. 47,959

18 Claims. (Cl. 197—1)

The present invention relates to the art of reproduction, and more particularly to the reproducing of typewritten matter by photo-engraving, photo-lithography, or otherwise. In the preparation of typewritten matter for any of the reproduction processes it is desirable to effect alignment of the last character of each line of typing so as to produce uniform right, as well as left-hand margins, as is characteristic of manually, or machine set composition.

My United States Patent No. 1,992,017, which issued February 19, 1935, discloses a method of aligning, or justifying, the successive lines of typewritten copy by utilization of a distortable, or extensible, character receiving medium so that the random length lines of typewritten copy may be individually stretched to register the last character of each line with a common right hand margin, the stretching and aligning of successive lines being a manipulative, as distinguished from an automatic, operation and being commonly performed after the completion of a page or sheet of writing.

It is accordingly an object of this invention to provide a new and improved method of, and means for, automatically effecting justification of individual lines of typing as an incident to completion of the writing of each such line.

It is another object to provide means effective as an incident to the completion of the writing of a line to automatically extend or stretch the writing medium to position the last character thereon in alignment with a predetermined marginal position.

A further object of the invention resides in the provision of means readily adapted for use in conjunction with a conventional typewriting machine to automatically accomplish justification of a written line.

Yet another object resides in the provision of means effective to utilize the characteristics of a stretchable writing medium to elongate a written line to predetermined line length as an incident to completion thereof.

It is another object to provide means adapted to produce a written line on an extensible medium, the medium being elongated to a predetermined length as an incident to completion of the writing of the line, and thereafter automatically adhered to a backing sheet arranged to accommodate a plurality of lines of writing in marginally aligned relationship.

Another object of the invention resides in the provision of a method of producing justified lines of typewritten matter consisting of the steps of typing on a stretchable character receiving medium while freely feeding the medium with respect to a writing position to effect letter spacing, terminating the writing prior to completion of a line corresponding to justified length, gripping the medium adjacent the last character written to arrest free feeding and then stretching the medium between the first and last written characters until the distance therebetween corresponds with the length of a justified line.

A further object is the provision of a method of preparing typewritten matter to justified line lengths which comprises the steps of writing successive lines on strips of a stretchable character receiving medium fed past a writing point in step-by-step increments to effect letter spacing, terminating the writing prior to completion of a line of justified length, continuing the feeding movement in a single continuous step to elongate the writing medium to justified length, and finally, adhering the successive elongated written lines to a common backing sheet to preserve their common length.

Other objects and advantages will be apparent in the following description of a preferred embodiment of the invention which has been selected for illustration in the accompanying drawings. It will be understood, however, that many changes in form, construction and arrangement may be made by those skilled in the art without departing from the scope and spirit of the invention as expressed in the appended claims.

Referring to the drawings:

Fig. 1 is a fragmentary, perspective view of a portion of a conventional typewriter equipped with a preferred form of the invention.

Fig. 2 is a front elevational view of part of the structure shown in Fig. 1.

Fig. 3 is a detailed, perspective view of means to adhere a stretchable writing medium to a backing sheet.

Fig. 4 is a fragmentary plan view of part of the structure shown in Fig. 2.

Fig. 5 is an enlarged elevational view of one element of the structure shown in Fig. 3.

Figs. 6 and 7 are enlarged elevational views of a preferred form of means to adhere a written line of extensible tape to a backing sheet the respective views representing positions of the same parts at different phases of an adhering operation.

Fig. 8 is an enlarged elevational view of means to sever a written length of tape from a continuous roll of the same material.

Figs. 9 to 18 inclusive are diagrammatic views of the positions of pertinent parts of the apparatus

at successive steps in a writing and justifying operation.

The frame of a typewriter is indicated at 10, it being understood that any one of the well-known commercial typewriting machines may be employed. A carriage 11 is operatively supported on the frame 10 for advancing and return excursions of movement between predetermined left and right-hand marginal positions, being urged in an advancing direction by a coiled spring 11a shown in dotted outline in Fig. 1. It will be understood that the action of the carriage advancing spring is controlled by an escapement mechanism (not shown) automatically operable to regulate the advancing movement of the carriage in successive letter-space increments.

A platen 12, journaled in the carriage 11, is adapted to support the paper or other character receiving medium upon which writing is to be imprinted. The customary nest of type bars is represented by a single type bar 13, each such type bar being arranged to impact the platen at the point 14 under control of keys 15.

Now referring to Figs. 1 and 3, a roll 16 is journaled in the carriage 11 in parallel relation with respect to the platen 12 and functions to store a supply of backing paper 17 which may be similar in all respects to the backing paper illustrated and described in my Patent No. 1,992,017. The sheet is fed forwardly from the roll 16 under the platen 12, and then upwardly past the writing line on the platen, suitable guides and fingers being utilized for this purpose.

A supply of stretchable, or extensible, character receiving medium 18 is stored on a spool 19, which, in the present instance, is journaled in the machine frame, but it will be understood that the spool may be carried by the carriage 11.

As shown in Figs. 2 and 3, the medium 18 is arranged to be fed longitudinally of the platen and substantially tangential thereto in a line corresponding to the writing line of the platen. To this latter end a guide 20, augmented by a guide roller 21, functions to lead the writing medium from its spool 19 to the box-like guide 22, the left-hand end of which, as viewed in Fig. 4, terminates adjacent the printing point on the platen.

The writing medium is arranged to partake of the step-by-step movement of the platen in the course of the writing of a line by means comprising a left-hand gripper 23 carried by the carriage 11.

Referring particularly to Fig. 4, the gripper 23 comprises an immovable leaf 24 and a relatively movable leaf 25, the latter being pivoted to the immovable leaf at 26 and normally urged to gripping position by means such as a coil spring. A dog 27, fixed to the carriage, is arranged to overlie the left-hand end of the movable leaf 25 of the gripper 23 to retain the latter in open position. A spring actuated camming finger 28 mounted in the machine frame in the path of movement of the dog 27 is effective to disable the latter during right-ward or return movement of the carriage, the relative positions of the dog and finger being such that the movable leaf snaps to closed position as an incident to the arrival of the carriage in its extreme left-hand marginal position.

Shortly after the beginning of the advancing movement of the carriage the dog 27 acts upon the camming face 28a of the finger 28 to idly move the latter downwardly without disturbing the relative relation of the dog 27 and gripper leaf 25.

Upon completion of writing, of all of the matter which is contemplated can be encompassed within a single line without writing beyond the predetermined right marginal position, the stretchable tape is gripped to prevent any additional feeding movement, the carriage however continuing to advance to the right margin, thereby stretching that portion of the writing medium upon which characters have been impressed so as to align the last written character with the predetermined right-hand marginal position. The means for thus gripping the writing medium to prevent further feeding comprises a right gripper generally designated 29 in Figs. 2, 3 and 4. The gripper 29 includes an immovable finger 30 which constitutes the rear wall of the guide 22 and extends parallel with the writing line of the platen in close proximity thereto, its left-hand end, as shown particularly in Fig. 4, terminating just to the left of the point 14, which defines the position of impact of the types 13. It will be seen that the immovable finger of the gripper 29 lies between the backing paper and printing medium and thus functions as a stationary platen to receive the force of impact of the types upon the writing medium thereby shielding both the backing paper 17 and platen 12 during the actual writing operation.

The movable leaf 31, of the right gripper 29, is adapted to be retained in open position as shown in Fig. 4, by means including a curved bell-crank lever 34, pivoted in the machine frame at 35 and comprising lever arms 34a and 34b. The lever arm 34a of bell-crank 34 is arranged to engage an arm 36 fixed to a downwardly extending portion of movable leaf 31 and extending radially of its pivotal axis. Lever arm 34b oscillates in the path of a spring actuated camming finger 37, supported in the machine frame and formed with a camming face 37a. Arcuate movement of bell-crank 34 in the direction of the arrow shown in Fig. 2 functions to swing leaf 31 of gripper 29 to open position as indicated in Fig. 4, through the action of bell-crank lever arm 34a on gripper leaf arm 36. Simultaneously with the above described action of the bell-crank arm 34a, its arm 34b rides over camming face 37a of cam finger 37, depressing the latter until the arm reaches the position shown in Fig. 4, whereupon the finger is elevated to prevent return movement of the bell-crank thereby retaining the right gripper leaf 31 in open position.

The beforementioned arcuate movement of bell-crank 34 is accomplished automatically in the return movement of the carriage to its left-hand marginal position so that the tape 18 will be freed from the right gripper preparatory to being engaged by the left gripper to commence the writing of another line. As shown in Figs. 2 and 4, a spring pressed detent 38, mounted on the carriage 11, and formed with a camming face 38a is positioned to travel in the path of arm 34b of bell-crank 34 so as to engage the latter adjacent its end momentarily prior to completion of the return movement of the carriage. As the carriage reaches its extreme marginal position the detent 38 carries beyond the end of lever 34b to assume the position indicated in Fig. 4, the finger 37 meanwhile having raised under the influence of its spring to block the bell-crank against a reverse movement as previously described. As the writing of another line progresses and the carriage again moves to the left, the camming face 38a of detent 38 engages the end of arm 34b and the cam is forced rearwardly against the action of its spring until its face has moved out of contact

with the arm whereupon the detent springs back to position to again engage the arm during a return excursion of the carriage.

As has been adverted to, the right gripper is caused to engage the tape at the end of the last word, syllable, or character which can be written within the predetermined line length, that is, within the set marginal limit; the carriage then being permitted to complete its advancing excursion to the marginal stop thereby extending or elongating the written line throughout its length and causing the last character written to assume a position in alignment with the fixed right hand margin. To insure coordination of the action of the right gripper, and release of the carriage for movement to its right-hand marginal position, the two functions are controlled by a single means in this instance a tubulating key **39**, (Fig. 2) which, in the present embodiment of the invention, functions as a justifying key. The finger **37**, which it will be recalled; acts to retain the gripper **29** in open position, is connected to lever **40**, of key **39**, by a link **41** the mechanical relationship being such that depression of the key serves to lower the finger out of the path of arm **34***b* prior to inaugulration of its justifying functions.

With respect to the justifying property of the tabulating key it will suffice to note that its depression effects a disablement of the escapement mechanism, the carriage thereby being freed for advancing movement under the influence of its propelling spring until arrested in right-hand marginal position by coacting carriage and machine stops **42** and **43** respectively, the latter of which is articulated to the tabulating key by a link **44**. Since the construction and operation of tabulating keys per se are well known in the typewriter art its features need not be elaborated upon.

Fig. 2 shows the carriage in its extreme right hand marginal position, both left and right grippers yet in engagement with the stretched writing medium.

In accordance with the invention disclosed in my beforementioned Patent Number 1,992,017, either the backing paper **17**, the extensible character receiving medium **18**, or both are previously treated with a non-drying adhesive but it will be distinctly understood to be additionally contemplated within the scope of this particular method of justification to apply an adhesive material to one or both of the respective adjacent surfaces of the backing paper and character receiving medium as an incident to the writing operation.

Reverting again to Fig. 2, it will now be understood that prior to releasing the written and justified lines of writing from the grippers it must be adhered to the backing paper to preserve its position in the body of the prepared copy. This operation is effected by means comprising a plurality of pressure bars **45**, (Fig. 3) pivotally and slidably supported in side-by-side relation on a shaft **46** which in turn is carried by similar arms **47**, pivoted intermediate their ends on a bracket **48** secured to the machine frame. A tie-rod **49** lends rigidity to the unitary rocking frame constituting shaft **46**, and the spaced similar arms **47**. As shown in detail in Figs. 6 and 7, the pressure bars **45** consist of elongated rectangularly shaped pieces whose width, or vertical dimension as shown in the drawings, is substantially the width of the tape **18** and whose thickness may correspond with the length of the letter space movement of the carriage or be any aliquot fraction of the justified line lengths defined by the positions of adjustment of the marginal stops. Each of the pressure bars is formed with an axial slot **50**, adjacent its forward end to receive the shaft **46**, and their forward upper edges are notched at **51** to accommodate a limiting stop-rod **52**, rigidly secured at its respective ends to the arms **47** of the beforemeneitnoed rocking frame. As will be evident in Fig. 3, the stop-rod **52** serves to limit clockwise rotation of the pressure bars (as viewed from the right end of the machine) at a point where their rear or pressing ends are in register with the printing line on the platen.

A leaf spring **53**, fixed to the stop-rod, projects downwardly and rearwardly into engagement with the forward lower edges of the pressure bars to yieldably hold the latter in operative position and to press them firmly against the written tape when the rocking frame is actuated. The spring **53** may be formed with a plurality of parallel slots **53***a*, spaced in accordance with the thickness of the pressure bars to provide in effect, separate springs for each bar. A sufficient number of pressure bars are carried on the rocking frame to adhere the maximum length of written line which the typewriter is capable of typing, the bars not required in the production of lines of lesser length being swung upwardly and forwardly to inoperative position as indicated by the group designated at **54** in Fig. 3.

Operation of the pressure bars, to adhere a written length of the tape to the backing paper, is availed of to release the left gripper from the finished line. In this connection the upper edge of each pressure bars is notched as at **55** so as to form a continuous channel extending normally of the principal axes of the bars when the latter are assembled on shaft **46**. A gripper releasing arm **56** (Fig. 3) is formed with a forked end **57** adapted to be slidably received in the channel defined by the notches **55** in the respective pressure bars, a thumb screw **58** effectively securing the releasing arm in lateral adjustment so that its projecting left end (as viewed from the front of the machine) engages the forwardly protruding portion of gripper blade **25** as the pressure bars adhere the tape to the backing paper. It will be recalled that dog **27** is effective to hold the blade **25** in open position when thus released from the tape.

Considering now the functional attributes of the pressure bars; it is desired to press, rather than impact, the tape into adhering engagement with the backing paper and the rocking movement of the pressure bar frame is accordingly such as will rapidly swing the bars to the point at which their rear ends just contact the tape, the frame thereafter continuing its movement at a slower rate to cause shaft **46** to move independently of the bars, the stop-rod **52** meanwhile pressing the bars rearwardly through the medium of spring **53**. The relative positions of the parts are shown in the above described phases of the adhering operation in Figs. 6 and 7. In Fig. 6 the pressure bar has just contacted the tape. In Fig. 7 the rocking movement of the frame has been completed.

The adhered portion of the tape is severed from the tape supply roll simultaneously with completion of the adhering operation. Referring to Figs. 3 and 8 a suitable cut-off knife is shown at **59**. The knife **59** comprises a body

portion which may be similar in contour to the pressure bars, its rear end 60 being ground to a cutting edge and its upper forward edge being formed with a notch 61 similar to the corresponding notches in the pressure bars and likewise arranged to accommodate the stop-rod 52. It will be noted that spring 53 also acts on the knife. To insure complete severance of the adhered section of the tape a shearing movement is imparted to the knife. This operation is effected by the coaction of shaft 46 in a camming slot 62 formed in the body of the knife. It will be obvious that as shaft 46 continues to move toward the platen from the position shown in Fig. 8, the rear, or cutting edge 60 of the knife, will move upwardly being meanwhile pressed against the tape by spring 53.

A spring 63, (Fig. 3) acting between the knife and the adjacent arm 47 of the rocking frame tends to maintain the former in the plane defined by the bank of pressure bars and to restore it to that position when the rocking frame withdraws from the platen at the conclusion of the adhering and cutting operation.

The rocking frame is actuated by means including a shaft 64 (Fig. 1) journaled for convenience on the bracket 48, and operatively connected to the frame by spaced arms 65 and links 66. Power means, in this instance a motor 67, is employed to oscillate shaft 64. As shown in Fig. 1, the motor 67 drives a shaft 68 to which a cam 69 is non-rotatably attached. An arm 70 of a bell-crank 71 pivoted to the machine frame at 72 is arranged to follow cam 69. Arm 73 of bell-crank 71, is drivingly connected to shaft 64 by a link 74 and arm 75, the latter part being fixed to shaft 64.

A normally inoperative one-revolution clutch 76, is interposed between the motor 67 and shaft 68. The clutch 76 may be of any desired type, such for example as the one fully described in United States Letters Patent to Oscar J. Sundstrand No. 1,925,735 dated September 5, 1933.

Clutch 76 is actuated, and thus imparts one revolution of movement to cam 69 to swing the rocking frame into and out of operative position, during the last part of the downward stroke of key 39. As shown in Fig. 2, an arm 77 of lever 78, pivoted in the machine at 79, has its free end spaced from, and in the path of, a downwardly projecting extension 80 of key 39. An arm 81 of lever 78 is connected to the clutch 76 by means of link 82 and lever arm 83. A tensile spring 84 maintains arm 70 in contact with cam 69.

Provision is made for automatically line-spacing the platen and returning the carriage to its left hand marginal position after any completed line has been adhered to the backing paper, and severed from the tape supply, thus conditioning the machine for commencing the writing of the next line. As illustrated in Fig. 1, the shaft 68 is equipped with a cam 85 arranged to actuate a depending link 86 which in turn is operatively connected to a toggle comprising arms 87 and 88, the former of which arms is pivoted to the machine frame at 89. A spring 90 urges the link 86 downwardly into engagement with cam 85. Toggle arm 88 is arranged to operate a friction clutch diagrammatically indicated at 91, to drivingly connect, a winding drum 92 to motor 67, by means of a link 93 and clutch arm 94. A spring 95, acting between a fixed bracket 96 and the clutch arm 94, yieldingly tends to maintain the clutch in disengaged position. A tape 97, attached to the drum 92 and extending over a machine guide roller 98 and carriage guide roller 99, is secured to the conventional platen line space pawl.

It will be obvious that as the drum 92 begins to rotate, the tape 98 will act to line space the platen and as the winding of the tape progresses the carriage will be returned toward its left hand marginal position. The clutch 91 is held in driving position until near the completion of the return excursion of the carriage by detent 100, defined by the end of a link 101 and suitably supported in the frame of the machine in the path of a tooth 102 on the toggle operating link 86.

Referring to Fig. 2, it will be seen that link 101 extends forwardly through the machine to a pin-and-slot connection 103 with an arm 104 rigid with the right gripper lever 34. A spring 105, acting between a fixed pin in the machine and link 101 tends to retain detent 100 in the path of tooth 102. As has been pointed out, the lever 34 is actuated shortly before the carriage completes its return movement, as a consequence of which link 101 will be drawn forwardly and detent 100 will be retracted to permit link 86, toggle arms 87, 88 and finally clutch 91 to return to initial or idle positions. Thus drum 92 ceases to rotate and the carriage comes to rest in its left-hand marginal position.

Now coming to the method of employing the apparatus described herein to produce justified typewritten matter. Successive steps in the process are identified with respect to related positions of the various elements of the device in Figs. 9 to 18 inclusive, detailed structural features being omitted in the interest of clarity.

It may be assumed that a suitable backing sheet 17 has been fed into position on the platen and that the carriage is about to be moved to its left hand marginal position in readiness to commence the writing of a new line. It will be recalled that under these circumstances the right gripper is closed, that is, in engagement with the tape, the end of which projects slightly to the left of the free end of the right gripper blade. This relationship is clearly shown in Fig. 18 wherein the vertical line which bisects the tape intermediate the two "X" characters, defines the point at which the tape is severed at the conclusion of the operations involved in the writing and adhering of a justified line. It might likewise be noted at this juncture, that the right hand one of the two "X" characters of Fig. 18 identifies the point of impact, or printing point, of the type bars of the machine, whereas the left hand "X" character corresponds with the position of the next previous character written. Otherwise stated, two adjacent letter space positions are identified by the two "X" characters shown, and the severing of the tape occurs between the two and thus to the left of the point at which the next character will be imprinted on the tape. Fig. 18 likewise illustrates the fact that the stationary blade 30, of the right gripper, underlies the tape at the printing point and hence serves to prevent the tape and backing sheet from adhering in the course of a writing operation when one or the other or both, are previously treated with a non-drying adhesive.

Now reverting to the return movement of the carriage to its left hand marginal position: As is well understood in the typewriter art, the coacting carriage and machine stops arrest return movement of the carriage in the position in which they are set, but the carriage propelling

spring would immediately act to drive the carriage in a reverse, or advancing direction were it not for the presence of escapement mechanism. Thus after returning to the point where its marginal stop abuts the machine stop, the carriage rebounds, in effect, until the escapement pawl coacts with the next adjacent tooth on the escapement wheel, thus blocking the carriage against advancing movement under the influence of its propelling spring and defining the true left hand marginal position of the carriage.

This machine characteristic of over-running the true left-hand marginal position is availed of to enable the left-hand gripper to engage an appreciable length of the end of the tape. Referring to Fig. 17, the terminus of extreme right-hand movement of the left gripper blade 23 is indicated as overlapping the "X" character which identifies the printing point on the platen. When the carriage rebounds under the influence of the propelling spring, to the point where the escapement defines the true left-hand marginal position of the carriage, the exereme right-end of gripper blade 23 will have moved to the left of the printing point and thus be out of the path of the type bars.

As shown in Figs. 9 and 11, the carriage advances in a letter-space direction under control of its escapement mechanism as the writing of a line progresses, the writing finally being terminated prior to arrival at the extreme right-hand marginal position to permit of elongating or extending the writing medium the balance of the distance to the marginal position to effect justification, that is alignment of the last character written with the common right-hand marginal position. As is the case with hand or machine set, (for example, linotype machine set composition), the point at which the writing or setting of a line is terminated must depend upon the judgment and experience of the operator, the desideratum being the division of the last word which can be received upon the line into proper syllable formation, in the event that its complete text cannot be encompassed within the set limitations of the line length.

Referring to Fig. 12 a condition is indicated in which the writing is advisably terminated after completion of a length "N" whereas the justified line length is shown as corresponding to the length "M". In this illustration the backing sheet 17 will be seen to be a distance "X" from the position it finally occupies when the carriage reaches its predetermined right-hand marginal position. In Fig. 14 this condition has been further indicated by designating the amount which the tape must be extended as corresponding to the distance "Z" which it will be understood is equal to the distance "X".

Now the key 39 is depressed, causing the right-hand gripper to move from released position, as shown in Fig. 9, to tape engaging position, as shown in Figs. 11, 13 and 15, it being recalled that the engagement, or gripping occurs just to the right of the last character written. Further movement of the key functions to disable the escapement mechanism as has heretofore been described, thereby permitting the carriage to advance in a continuous movement until arrested by the marginal stops, the tape 18 meanwhile being stretched or elongated to justified line length. As is clearly indicated in Fig. 14, this elongation of the tape is equivalent to the length "Z", the movement referred to having also served to advance the backing paper 17 through the corresponding distance "X" shown in Fig. 12.

The tape now having been elongated to justified length and being held between the respective left- and right-hand grippers, the cycle of operations is completed by adhering the written line to the backing paper and releasing the left-hand gripper in anticipation of commencing a return movement of the carriage for the purpose of repeating the above described operations. These last mentioned functions, like those of actuating the right-hand gripper and releasing the carriage for continuous movement to its predetermined right-hand marginal position, are accomplished by depression of the key 39. As has been pointed out, the rocking frame including arms 47 and pressure bars 45 are moved from their normal inoperative position to effect a pressing engagement of the bars against the written line of tape, the cut-off knife 59 being simultaneously operated to sever the adhered portion of the tape from the supply roll. As an incident to the adhering and cutting-off operation, the part 56 functions to release the left gripper from the adhered line of writing, (Figs. 15 and 16) and the machine is then in readiness to commence the writing of a new line upon return of the carriage to its left-hand marginal position.

Simultaneously with the beginning of its return excursion, the platen is line-spaced to move the completed and justified line upwardly beyond the writing line on the platen and momentarily prior to completion of its return travel the carriage functions to release the right gripper from tape engaging position.

It will be seen that I have provided a practicable method of producing justified type-written copy through the medium of apparatus which is both simple in operation and economical of manufacture.

I claim as my invention:

1. The method of preparing typewritten matter to justified line lengths which comprises the steps of writing successive lines on strips of an extensible character receiving medium while feeding the latter past a writing position in step-by-step increments to effect letter spacing, terminating the writing prior to completion of a line of justified length holding the medium stationary at a point adjacent the last character written, continuing the feeding movement in a single continuous step to elongate the writing medium between the first and last written characters to justified length, and finally, adhering the successive elongated written lines to a common backing sheet in marginally aligned relationship.

2. The method of preparing typewritten matter to justified line lengths which comprises the steps of writing successive lines on strips of an extensible character receiving medium while feeding the latter past a writing position in step-by-step increments to effect letter spacing, terminating the writing prior to completion of a line of justified length, gripping the medium adjacent the last character written to hold the latter stationary at that point, continuing the feeding movement in a single continuous step to elongate the writing medium between the first and last written characters to justified length, and finally, adhering the successive elongated written lines to a common backing arranged to move with and define the marginal positions of, respective justified written lines.

3. The method of preparing justified typewritten matter which consists of the steps of typing

on a stretchable character receiving tape while feeding the latter synchronously with, and in overlying relation with respect to a backing sheet movable between predetermined left and right hand marginal positions corresponding to the length of a justified line, terminating the writing prior to completion of the movement of the backing sheet to its right marginal position, engaging the tape adjacent the last character written to arrest feeding movement thereof, and then continuing the movement of the backing sheet to its right marginal position, and simultaneously moving the tape in a feeding direction by a force exerted at a point adjacent the first character written to effect an elongation of the tape intermediate the first and last written characters until the distance therebetween corresponds to the length of a justified line.

4. The combination with a typewriter including a platen movable between predetermined left, and right-hand marginal positions; of a backing sheet on the platen, a stretchable character receiving tape adapted to be adhered to said backing sheet, means movable with said platen to engage said tape at a point adjacent the left-hand marginal position of the platen and to move the tape therewith, relatively stationary means to engage said tape at a point adjacent the right-hand marginal position of said platen to cause the portion of the tape intermediate said engaging means to be stretched as an incident to further movement of the platen, means to press said intermediate portion of the tape into adhering engagement with said backing sheet, means to sever said adhered portion of said tape, means to return the platen to left hand marginal position, and a single manually operable means to actuate said second mentioned tape engaging means, said adhering means and said severing means seriatim.

5. The combination with a typewriter including a platen movable between predetermined left, and right-hand marginal positions; of a backing sheet on the platen, a stretchable character receiving tape adapted to be adhered to said backing sheet, means movable with said platen to automatically engage said tape at a point adjacent the left-hand marginal position of the platen and to move the tape therewith, relatively stationary means to engage said tape at a point adjacent the right-hand marginal position of said platen to cause the portion of the tape intermediate said engaging means to be stretched as an incident to further movement of the platen, means to press said intermediate portion of the tape into adhering engagement with said backing sheet and to move said first mentioned engaging means to released position, means to sever said adhered portion of said tape, means to return the platen to left hand marginal position, and means to release said second mentioned tape engaging means as an incident to completion of the return movement of the platen.

6. The combination with a typewriter including a platen movable between predetermined left, and right-hand marginal positions; of a backing sheet on the platen, a stretchable character receiving tape adapted to partake of the movement of the platen and be adhered to said backing sheet, means movable with said platen to automatically engage said tape as an incident to movement of the platen to marginal position, relatively stationary means to engage said tape at a point adjacent the right-hand marginal position of said platen to cause the portion of the tape intermediate said engaging means to be stretched as incident to further movement of the platen, means to adhere said intermediate portion of the tape to said backing sheet, automatically operable means to release the first mentioned tape engaging means from the adhered tape, means to return the platen to left hand marginal position, and means to release the second mentioned tape engaging means as an incident to completion of return movement of said platen.

7. The combination with a typewriter including a platen movable between predetermined left, and right-hand marginal positions; of a backing sheet on the platen, a stretchable character receiving tape adapted to be adhered to said backing sheet, means movable with said platen to engage said tape at a point adjacent the left-hand marginal position of the platen and to move the tape therewith, relatively stationary means to engage said tape at a point adjacent the right-hand marginal position of said platen to cause the portion of the tape intermediate said engaging means to be elongated as an incident to further movement of the platen, means to press said intermediate portion of the tape into adhering engagement with said backing sheet and means to sever said adhered portion of said tape.

8. The combination with a typewriter including a platen movable between predetermined left, and right-hand marginal positions to effect letter spacing; of a backing sheet on the platen, a stretchable character receiving tape adapted to be adhered to said backing sheet, means to engage said tape at a point adjacent the left-hand marginal position of the platen and move the tape with the platen, means to engage the tape at a point intermediate the left and right-hand marginal positions of the platen to cause the portion of the tape intermediate said engaging means to be elongated as an incident to further movement of the platen, and means to press said intermediate portion of the tape into adhering engagement with said backing sheet.

9. The combination with a typewriter including a platen movable between predetermined left, and right-hand marginal positions to effect letter spacing; of a backing sheet on the platen, a stretchable character receiving tape adapted to be adhered to said backing sheet, means to engage said tape at a point adjacent the left-hand marginal position of the platen and move the tape with the platen, means to engage the tape at a point intermediate the left and right-hand marginal positions of the platen to cause the portion of the tape intermediate said engaging means to be stretched as an incident to further movement of the platen, and a key to actuate said second mentioned tape engaging means and to release said platen for a continuous movement to its right-hand marginal position.

10. The combination with a typewriter including a platen movable between predetermined left, and right-hand marginal positions to effect letter spacing; of a backing sheet on the platen, a stretchable character receiving tape adapted to be adhered to said backing sheet, means to engage said tape at a point adjacent the left-hand marginal position of the platen and move the tape with the platen, means to engage the tape at a point intermediate the left and right-hand marginal positions of the platen to cause the portion of the tape intermediate said engaging means to be elongated as an incident to further movement of the platen, and key controlled

means to press said intermediate portion of the tape into adhering engagement with said backing sheet, to sever the adhered portion of the tape and release said first mentioned tape engaging means, to line-space said backing sheet, and to return said platen to left hand marginal position.

11. The combination with a typewriter including a platen movable between predetermined left and right-hand marginal positions to effect letter spacing and types arranged to impact said platen at a common point; of a backing sheet on the platen, a stretchable character receiving tape adapted to be adhered to said backing sheet, means to guide said tape for movement in proximity to said backing sheet, said guide means including a part lying intermediate said backing sheet and tape and projecting across the point of impact of said types, means operable as an incident to movement of said platen to left hand marginal position to engage said tape on a line adjacent, and to the left of, the point of impact of the types and to move the tape with the platen, and relatively stationary means to engage the tape at a point intermediate the left and right-hand marginal positions of the platen on a line adjacent, and to the right of, said impact point to permit the portion of the tape intermediate said engaging means to be elongated as an incident to further movement of the platen to align the first and last written characters with predetermined marginal positions.

12. The combination with a typewriter including a platen movable between predetermined left and right-hand marginal positions to effect letter spacing and types arranged to impact said platen at a common point; of a backing sheet on the platen, a stretchable character receiving tape adapted to be adhered to said backing sheet, means to guide said tape for movement in proximity to said backing sheet, said guide means including a part lying intermediate said backing sheet and tape and projecting across the point of impact of said types, means to engage said tape to the left of said impact point when said platen is in left hand marginal position and thus move the tape with the platen, stationary means to engage the tape at a point intermediate the left and right-hand marginal positions of the platen and to the right of said impact point to cause the portion of the tape intermediate said engaging means to be elongated as an incident to further movement of the platen, and means to press said intermediate portion of the tape into adhering engagement with said backing sheet as an incident to completion of the movement of the platen to right-hand marginal position.

13. The combination with a typewriter including a platen movable between predetermined left and right-hand marginal positions to effect letter spacing and types arranged to impact said platen at a common point; of a backing sheet on the platen, a stretchable character receiving tape adapted to be adhered to said backing sheet, means to guide said tape for movement in proximity to said backing sheet, said guide means including a part lying intermediate said backing sheet and tape and projecting across the point of impact of said types, means to engage said tape to the left of said impact point when said platen is in left hand marginal position, and thus move the tape with the platen, stationary means to engage the tape at a point intermediate the left and right-hand marginal positions of the platen and to the right of said impact point, to cause the portion of the tape intermediate said engaging means to be elongated as an incident to further movement of the platen, means to press said intermediate portion of the tape into adhering engagement with said backing sheet, and means to sever said tape on a line adjacent, and to the left of the end of the projecting part of said guide means.

14. In a device of the character described, the combination of a platen and a backing sheet thereon, of a character receiving medium adapted to be pressed into adhering engagement with said backing sheet, and means to press said character receiving medium into adherence with said backing sheet including a rockable frame, a plurality of pressure bars supported on said frame, and means to rock said frame to move said pressure bars into and out of pressing position.

15. In a device of the character described, the combination of a platen movable in letter space increments with respect to a printing point, a stationary platen to shield the first-mentioned platen at the printing point, a roll of character receiving medium in the form of a tape, means to guide said tape longitudinally of the axis of movement of said movable platen past said printing point, and means on said movable platen to engage said tape to move the latter therewith.

16. In a device of the character described, the combination of a platen movable in letter space incrments with respect to a printing point, a stationary platen to shield the first-mentioned platen at the printing point, a roll of character receiving medium in the form of a tape, and means to guide said tape longitudinally of the axis of movement of the platen past said printing point.

17. In a device of the character described, the combination of a platen movable in letter space increments with respect to a printing point, a backing sheet arranged to move with and normally to said platen to successively expose related parallel lines thereof to said printing point, a tape of character receiving medium arranged to be fed longitudinally of the axis of letter space movement of said platen past said printing point, and means to assemble substantially equal lengths of said tape on said backing sheet in the successive lines of the latter which are exposed to the printing point as an incident to the movement of the backing sheet normally of the axis of the platen.

18. In a machine of the class described, the combination of a carriage adapted to receive a sheet medium, keys, means operable to feed said sheet medium in one direction, a tape medium, means under control of said keys to feed said tape medium in step-by-step movements in a direction normal to the described direction of movement of said sheet medium and in overlapping relation with respect thereto, and separate key means operable to sever successive substantially equal lengths of said tape and to apply the same to said sheet medium in timed relation with the first mentioned feeding movement of the latter to produce a columnar arrangement of successive lengths of said tape on said sheet.

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