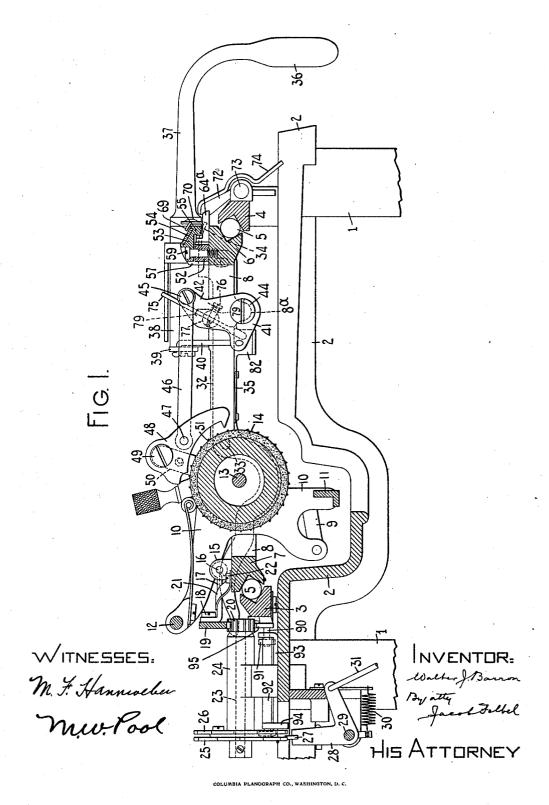
W. J. BARRON. TYPE WRITING MACHINE. APPLICATION FILED AUG. 26, 1910.

1,003,974.

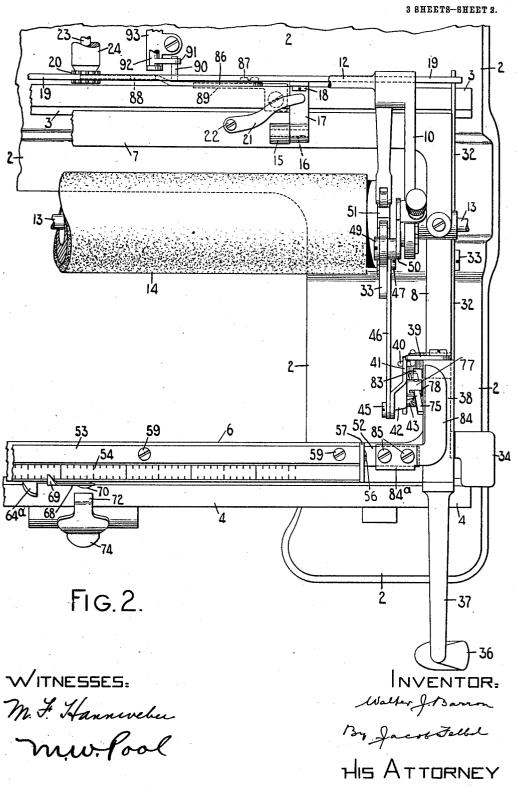
Patented Sept. 26, 1911. 3 SHEETS-SHEET 1.



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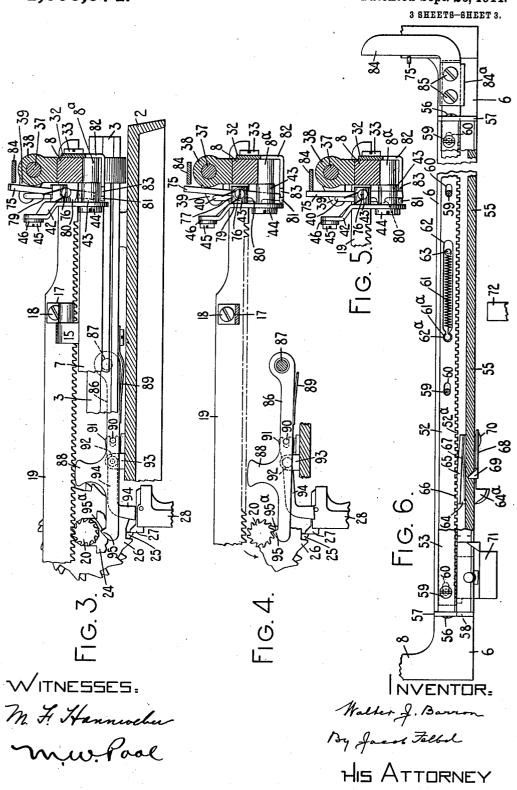
W. J. BARRON.

TYPE WRITING MACHINE.

PPLICATION FILED AUG. 26, 1910

1,003,974.

Patented Sept. 26, 1911.



UNITED STATES PATENT OFFICE.

WALTER J. BARRON, OF NEW YORK, N. Y., ASSIGNOR TO REMINGTON TYPEWRITER COMPANY, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

1,003,974.

Specification of Letters Patent. Patented Sept. 26, 1911.

Application filed August 26, 1910. Serial No. 579,077.

To all whom it may concern:

Be it known that I, Walter J. Barron, citizen of the United States, and resident of the borough of Brooklyn, city of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting ma10 chines and has for its principal object to
provide improved devices to automatically
disconnect said carriage from its letter feeding devices, preliminary to returning or restoring the carriage in the direction opposite
15 to that of letter feeding, and to reconnect
said carriage with said letter feeding devices
at the end of a return movement.

Another object is to provide improved means for maintaining the relationship be20 tween the letter feeding devices when they are disconnected from the carriage.

To the above and other ends my invention consists in the features of construction, combinations of devices and arrangements of parts hereinafter described and particularly

25 parts hereinafter described and particularly pointed out in the claims. While my invention may be adapted in whole or in part to various styles of writing machines, I have shown it herein as applied 30 to a No. 10 Remington typewriting machine. In said machine as heretofore constructed the feed rack remains engaged with the feed pinion during the return movements of the carriage and consequently the normally en-35 gaged escapement wheel which is rigidly connected with said pinion will be turned backward and each tooth of said escapement wheel will cause a vibration of the co-acting feed dog, thus increasing the wear of the parts and adding to the noise of operation. By my present invention I provide for lifting the feed rack automatically out of engagement with the feed pinion at the beginning of the return movement of the carriage 45 when the line space lever or handle is operated, the co-action of the margin stop devices when they arrest the carriage at the beginning of a new line operating automatically to release the rack and permit it 50 to reëngage with the feed pinion. As a consequence the letter feeding or escapement devices proper remain unaffected during the return movements of the carriage and noise and wear are eliminated while

ing the carriage is lessened by the amount required for turning the feed pinion, its shaft and the escapement wheels.

My invention will be explained more at length in connection with the accompanying drawings which illustrate one form of the invention and wherein

Figure 1 is a vertical front to rear sectional view of the upper part of a No. 10 Remington typewriting machine embodying my invention, parts of the machine being omitted. Fig. 2 is a fragmentary plan view of said machine, parts being omitted and parts broken away, said figure more especially illustrating the line spacing mechanism and connected parts. Fig. 3 is a front vertical sectional view showing the line spacing and letter feeding mechanism with which my invention is more particularly associated. Fig. 4 is a view corresponding with Fig. 3 but omitting some of the parts shown therein and showing other parts in different relationships. Fig. 5 is a view corresponding to the right-hand side of Fig. 4 but showing different relationships of the parts. Fig. 6 is a fragmentary plan view partly in section showing the margin stop bar and the mounting thereof, together with associate parts.

Referring especially to Figs. 1 and 2, 85 the main frame of the machine comprises upright posts 1, supporting a top plate 2. Fixed guide rails 3 and 4 are arranged above said top plate and are grooved to receive anti-friction balls 5 which likewise 90 cooperate with grooved front and rear bars 6 and 7 of a truck which further comprises connecting end bars 8. Said truck is connected by links or devices 9, one of which is shown, with the end bars 10 of a shiftable 95 platen frame or carrier which further comprises connecting cross bars 11 and 12. The end bars 10 provide bearings for the axle 13 of a roller platen 14 for which the frame and truck aforesaid constitute a car- 100 riage that is constantly urged leftward above the top plate by the usual carriage power or spring drum (not shown). It will be understood that the usual or suitable printing instrumentalities are adapted 105 to cooperate with the platen, although said instrumentalities do not appear in the draw-

ing the return movements of the carriage ings.

and noise and wear are eliminated while Lugs 15 rise from the rear bar 7 of the

55 the amount of power necessary for return-truck and pivotally support at 16 rear- 110

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wardly extending arms 17 which are secured by screws 18 to a feed rack 19. Said feed rack is toothed along its lower edge and cooperates with a feed pinion 20. Leaf springs 21, secured by screws 22 to the rear truck bar 7, engage at their free ends with the arms 17 and normally maintain the feed rack 19 in spring-pressed engagement with the feed pinion 20. Said pinion is fixed to 10 the front end of a shaft 23 bearing in a fixed bracket 24. Toothed escapement wheels 25 and 26 are rigidly secured to the rear end of said shaft, the rear escapement wheel 25 cooperating normally with a feed 15 dog 27 mounted on a dog rocker 28 having a fixed pivot 29 and provided with a restoring spring 30. A link 31 connects the dog rocker with universal bar mechanism (not shown). At each printing operation the 20 link 31 operates to vibrate the dog rocker 28, causing the escapement device or dog 27 to cooperate with the escapement devices or wheels 25 and 26 to permit a letter space movement of the carriage under the pull 25 of the spring drum. As heretofore constructed, when the carriage is restored from left to right to begin a new line, the rack 19 operates through the pinion 20 to turn the escapement wheels backward, causing 30 the teeth of the escapement wheel 25 as they turn backward to click over and vibrate the dog 27.

Two release levers are provided of which the right-hand one 32 is shown. Said lever 35 is pivoted at 33 to the right-hand end bar 8 and its rear arm curves under the platen axle, its free end underlying the right-hand end portion of the rack 19. The lever 32 extends toward the front of the carriage 40 along the end bar 8 and terminates at the forward free end in a horizontally disposed finger piece or key 34. When the release key 34 is depressed the rear end of the lever 32 is elevated against the rack 19, operating 45 to lift said rack from the feed pinion 20, thus disconnecting the carriage from the escapement or letter feeding devices. the key 34 is released the rack will be restored to engagement with the feed pinion 50 20 by the springs 21. The release lever is provided with a restoring spring 35. It will be noted that the normal longitudinal relationship between the feed rack and the carriage is unvarying, the rack not having 55 a yielding mounting as in some prior con-

The line spacing mechanism of the machine comprises a handle or finger piece 36 depending vertically from the forward end 60 of a horizontal rearwardly extending rock shaft 37. Said rock shaft is arranged above the right-hand end bar 8 and bears in a lug or bracket 38 on said end bar. Screwed fast to the rear end of the rock shaft 37 is a 65 crank arm 39 which extends laterally in-

ward and is connected by a depending link 40 with the rearwardly extending arm 41 of a bell crank which further comprises an arm 42 and a hub 43. The hub bears on a shouldered screw 44 which is secured to 70 a lug 8^a on the under side of the end bar 8. The upper end portion of the arm 42 is off-set inward and the free end of said arm is pivotally connected at 45 with a rearwardly extending link 46 which is pivotally 75 connected at 47 with a line spacing pawl 48, said pawl being pivoted at 49 to an arm 50 pivotally supported on the platen axle 13. The line spacing pawl 48 is normally disconnected from but is adapted to co- 80 operate with the teeth of a line spacing ratchet wheel 51 which is operatively connected with the left-hand end of the plate 14.

When the end of a line of writing is reached the handle 36 is pulled rightward 85 to line space the platen and restore the car-The rightward movement of the handle turns the rock shaft 37, lowering the crank arm 39 and link 40 and rocking the bell crank 41, 42, forcing the link 46 rear- 90 ward, said link 46 causing the pawl 48 to engage with the ratchet wheel 51 and operating, as the arm 50 is swung rearward, to turn said ratchet wheel one or more units of line space distance according to the ex- 95 tent of movement or throw of the pawl 48, which is controlled by adjustable limiting devices (not shown). When the platen has been line spaced as described, continued rightward pressure on the handle 36 operates 100 to retract the carriage until it is arrested by the margin stop mechanism next to be described. On releasing the handle 36 the line spacing devices are restored to normal position by a spring (not shown) coiled 105 around the shaft 37 within the bearing 38.

The carriage stop mechanism includes margin stop devices which comprise a stop rack bar 52 that in the present instance is slidably mounted on the front rail 6 of the 110 carriage (Figs. 1, 2 and 6). Arranged over the bar 52 and extending lengthwise thereof is a covering member or bar 53 which is provided with a scale plate 54 and at its forward side terminates in a downwardly ex- 115 tending lip 55. Secured by screws 56 to the ends of the cover bar 53 are end plates or bridges 57. The bottom edges of these end plates contact with the top face of the carriage bar 6 and said end plates are of such 120 height that they maintain the cover bar 53 separated from the rack bar 52, as shown in Fig. 1, the construction being such that the rack or stop bar may move endwise without interference from the cover bar, said rack 125 bar passing through suitable openings 58 in the end plates 57. The cover bar is secured fixedly to the carriage bar 6 by screws 59 which pass downward through the cover bar and through slots 60 in the rack bar and 130

1,003,974

engage tapped holes in the bar 6. Endwise movement of the rack bar is limited by the ends of the slots 60 coacting with the shanks of the screws 59. Normally the rack bar is 5 held with the left-hand ends of the slots 60 engaging the screws 59 as shown in Fig. 6. The holding means comprise a coiled spring 61 which is arranged in a slot-way or opening 62 in the rack bar 52. The right-hand 10 end of said spring is hooked over a pin 63 which projects upward from the carriage bar 6, while the left-hand end of said spring is looped, as indicated at 61a, and the loop is seated in a corresponding opening or eye 62a 15 which communicates with the slot 62 by a narrow passageway, the construction being such that the loop cannot pull out of the eye and the left-hand end of the spring is thereby connected with the rack bar. It will be un-20 derstood that the spring 61 and its connections are seated or contained within the rack bar 52 and do not interfere with the free endwise movements of said rack. Any other construction of spring mechanism may be 25 employed for locating the rack bar 52 and returning it to normal position.

The rack bar provides a support for the adjustable margin stops which are of the usual or any other suitable construction, 30 those shown in the drawings being like the margin stops of the Remington No. 10 machine. Each margin stop as shown in Figs. 1 and 6, comprises a plate-like body portion 64 which is seated on the top face of the car-35 riage bar 6. At its rear the body portion 64 is provided with an upstanding lip 65 which is confined loosely between the rack bar 52 and the overhanging lip 55 on the cover bar. The rear face of the margin stop is pro-40 vided with one or more teeth 66 which are normally maintained in engagement with the teeth 52° at the forward edge of the rack bar by a leaf spring 67 which co-acts with the front of the lip 65 and the rear of the lip 45 or ledge 55. Extending horizontally forward from the end of the body portion 64 is a lug 64^a which provides a margin stop proper. A plate 68 is secured at the front of the body portion 64 outside the lip 55 and 50 is provided with a pointer 69 which co-operates with a scale 54, and said plate 68 also has a protuberance or finger portion 70. By pressing against this finger portion the spring 67 is overcome and the teeth 66 swung 55 forward out of engagement with the teeth 52a, the rear face of the lip 65 co-acting with the teeth 52ª to the right of the engaged teeth and which serve as a fulcrum for the swinging movement of the margin stop member. The margin stop member is thus freed so that it may be adjusted to any desired position along the type bar 52. On releasing the finger piece 70 the teeth of the stop member reëngage with the tooth of the rack bar 52 and subsequently during sliding move-

ment of the rack bar 52 the margin stop member is carried with it. The stop member shown and described is the left-hand one and it assists to define the beginning of the line of writing. A similar margin stop member 70 may be provided near the right-hand end of the rack bar 52. A final stop member 71 is arranged on the rack bar to the left of the margin stop member above described.

The stop proper 64° is adapted to co-act 75 with a frame stop 72 pivoted at 73 to the fixed front rail 4 and provided with a finger piece 74 below the pivot 73 whereby the stop 72 may be swung out of the path of the margin stop proper 64a. The stop 72 is then 80 in position to co-act with the stop 64a. When the carriage is returned the co-action of the two stops arrest the carriage and return it for a new line of writing. It will be observed that with the present construction, if 85 rightward pressure on the handle 36 be continued after the stop 64a contacts with the stop 72, the carriage will not be immediately arrested, owing to the yielding mounting of the stop 64° but may continue to move until 90 the shanks of the screws 59 contact with the right-hand ends of the slots 60, when the carriage will be arrested for the reason that the rack bar or member 52 is held at this time by the stop 72. As soon as rightward 95 pressure is removed from the handle or finger piece 36, the spring 61 may operate to move the carriage back toward the left, the movement continuing until the screws 59 co-act with the left-hand ends of the slots 100 60, as shown in Fig. 6. In the Remington machine aforesaid, the stop rack bar is rigid on the carriage and not yieldingly mounted, as hereinbefore described. Otherwise the margin stop mechanism, as above described, 105 corresponds with that of the machine.

As herein shown, I provide for automatically lifting the feed rack 19 out of engagement with the feed pinion 20 when the handle 36 is pulled to line space the platen. The 110 devices for accomplishing this result comprise operative connections between the line spacing mechanism and the carriage feeding device or feed rack 19. Said connections include an upwardly and forwardly inclined 115 lever 75, which as appears from Figs. 1 to 5, is fulcrumed on a screw pin 76 which is supported on the lug 77 extending rightward from the arm 42 of the bell crank 41—42. The lever 75 is arranged in a slot or kerf 78. 120 A coiled spring 79 co-acts with the lever 75 to maintain it normally in the position shown in Fig. 3 with a stop lug 80 formed on the lower arm of said lever in contact with the right-hand face of the bell crank 125 erm 42. It will be understood that the lever 75 moves bodily with the bell crank 41—42, when the latter is turned on its pivot and that said lever 75 has a pivotal movement on the screw or fulcrum 76, which pivotal 130

movement is independent of movement by the bell crank 41-42. The lower end of the lever 75 is adapted to co-act with the lefthand end portion 81 of a finger or extension 82 which is fixed to or integral with the releasing lever 32 and extends downward from said lever forward of the fulcrum 33 and then extends at right angles horizontally inward, underlying the lower end of the lever 10 75. A slot 83 is formed in the end portion of the extension or finger 81 just to the right of the point at which the lever 75 co-acts with said extension.

Normally the lever 75 is above and out 15 of contact with the extension 81, as shown in Figs. 1 and 3, but when the line spacing handle is operated to line space the platen the bell crank arm 42 is rocked rearward and downward, carrying with it the lever 75 20 and causing the lower end thereof to press against the extension 81, thereby swinging downward the forward arm of the releasing lever 32 and raising the rear arm of said lever, causing it to co-act with the rack 19 25 and disconnect said rack from the pinion 20, as shown in Fig. 4. If, now, pressure on the line spacing handle 36 be continued, the carriage will be retracted toward the right without affecting the pinion 20 or the escape-

30 ment wheels rigid therewith. In order to automatically release the feed rack 19 at the end of the carriage movement so that said rack may return into engagement with the pinion 20, I have provided de-35 vices comprising an angular member or finger 84 which is secured by screws 85 to the right-hand end of the rack member 52 outside the right-hand end plate 57, as shown in Figs. 2 and 6. Forward of the 40 securing screws 85 a lip 84ª projects downward at the front of the rack bar 52. the right of the screws the finger 84 extends horizontally rearward, passing to the right of the lever 75 and terminating somewhat

45 to the rear of the upper arm of said lever. Normally the lever and the finger or member 84 are separated as shown in Fig. 3 and remain separated as shown in Fig. 4, after the lever has operated to lift the rack. 50 When, however, the carriage has been moved rightward, causing the stop 64° to co-act with the stop 72 and arrest the rack bar 52, the finger 84 fixed to said rack bar will also be arrested, but the lever 75 which is 55 mounted on the carriage will continue to move rightward until the screw stems 59 engage the right-hand ends of the slot 60. This additional rightward movement of the lever 75 after the finger 84 has been arrested, 60 brings the upper arm of said lever into engagement with the left-hand edge of said inger and swings the lever on its fulcrum 76 from the position shown in Fig. 4 to that

shown in Fig. 5. This swinging movement

the extension 82 and brings the lever arm in register with the slot 83, thus releasing the lever 32 and rack 19 and permitting these parts to be restored to their normal positions. If, now, the line spacing handle 36 70 be released the carriage and rack bar 62 will be restored to their normal relationship by

the spring 61.

As shown in the No. 10 Remington machine means are provided for locking the 75 pinion 20 when the rack 19 is disconnected therefrom. Said means comprise an arm 86 which underlies the rack 19 and is pivoted at 87 to the rear fixed rail 3. The arm 86 has an upward extension or shoe 88 which is 80 adapted to be urged upward constantly by a spring 89 but is normally restrained by the engagement of the shoe 88 with the teeth of the rack 19, as shown in Fig. 3. The arm 86 cooperates through a pin 90 with a slotted 85 crank arm 91 on a rock shaft 92 which is supported in a fixed bracket 93 and also carries a crank arm or lock 94, which, when the arm 86 is raised, passes down in front of the upper end of the dog rocker 28 and pre- 90 vents forward movement of said rocker arm. The train of mechanism beginning with the arm 86 and terminating with the arm 94 is not my invention and is not claimed per se by me. My particular improvements in this 95 connection relate to the inner or left-hand portion of the arm 86 which, as heretofore constructed, terminates in a tooth which is adapted to co-act with the teeth of the feed pinion 20 to lock said feed pinion against 100 turning movement. As herein shown, I provide for this purpose a tooth 95 which is novel in shape and has a novel function. The inner or right-hand edge 95° of this tooth 95 is inclined upward or leftward, 105 forming a cam edge which, when the arm 86 swings up, co-acts with a pinion tooth in such a way that the tooth is cammed rightward. This camming action against the tooth tends to turn the pinion 20 in the direction of the arrow in Fig. 4. This turning tendency is communicated from the pinion 20 to the escapement wheels 26 and 25, thus forcing the engaged tooth of the wheel 25 tightly against the feed dog 27 so that the 115 parts are tightly held without being capable of any lost motion whenever the rack 19 is lifted from the pinion 20, either during return movements of the carriage, as hereinbefore described, or when either of the re- 120 lease keys is operated separately or alone, or when the tabulating mechanism (not shown)

Various changes may be made within the scope of my invention, and parts of it may 125

be used without other parts.

What I claim as new and desire to secure by Letters Patent, is:

1. In a typewriting machine, the combinaof the lever disengages its lower end from tion of a traveling carriage, a platen there- 130

and also independently thereof.

2. In a typewriting machine, the combination of a traveling carriage, a platen thereon, disconnectible carriage feeding devices, line spacing mechanism, and means operative automatically by said line spacing 15 mechanism for disconnecting said devices, said devices being automatically re-connected at the end of return movements of said carriage, said means comprising a lever bodily translatable by said line spacing mechanism, said lever being rotatable on its fulcrum independently of said line spacing mechanism.

3. In a typewriting machine, the combination of a traveling carriage, a platen thereon, disconnectible carriage feeding devices, line spacing mechanism, and means operative automatically by said line spacing mechanism for disconnecting said devices, said devices being automatically re-con-30 nected at the end of return movements of said carriage, said line spacing mechanism comprising a lever and said means comprising a lever which is mounted on said first named lever.

4. In a typewriting machine, the combination of a traveling carriage, a platen thereon, disconnectible carriage feeding devices, line spacing mechanism, and means operative automatically by said line spacing 40 mechanism for disconnecting said devices, said devices being automatically re-connected at the end of return movements of said carriage, said line spacing mechanism comprising a bell crank lever and said means com-45 prising a lever of the first order fulcrumed upon one arm of said bell crank lever.

5. In a typewriting machine, the combination of a traveling carriage, a platen thereon, disconnectible carriage feeding devices, 50 line spacing mechanism, and means oper-ative automatically by said line spacing mechanism for disconnecting said devices, said devices being automatically re-connected at the end of return movements of 55 said carriage, said line spacing mechanism comprising a manually controlled rock shaft, a bell crank lever connected thereto, and a line spacing pawl connected to said bell crank lever, and said means comprising a 60 lever connected to said bell crank lever.

6. In a typewriting machine, the combination of a traveling carriage, a platen thereon, disconnectible carriage feeding devices, line spacing mechanism, and means oper-65 ative automatically by said line spacing 1

mechanism for disconnecting said devices, said devices being automatically re-connected at the end of return movements of said carriage, said line spacing mechanism comprising a manually controlled rock shaft, 70 a bell crank lever connected thereto, and a line spacing pawl connected to said bell crank lever, and said means comprising a lever fulcrumed on said bell crank lever.

7. In a typewriting machine, the combina- 75 tion of a traveling carriage, a platen thereon, carriage feeding devices comprising a feed rack operative to free said carriage from the control of said devices, a key controlled lever for actuating said rack, line 80 spacing mechanism, and means operative automatically by said line spacing mechanism for actuating said key controlled lever, said carriage feeding devices being automatically re-connected at the end of return 85 movements of said carriage, said line spacing mechanism comprising a manually controlled rock shaft, a line spacing pawl, a bell crank lever connected to said rock shaft and to said pawl, and said means comprising 90 a lever fulcrumed on said bell crank lever and operative on said key controlled lever.

8. In a typewriting machine, the combination of a traveling carriage, a platen thereon, carriage feeding devices comprising a 95 feed rack operative to free said carriage from the control of said devices, a key controlled lever for actuating said rack, line spacing mechanism, and means operative automatically by said line spacing mechanism 100 for actuating said key controlled lever, said carriage feeding devices being automatically re-connected at the end of return movements of said carriage, said line spacing mechanism comprising a manually controlled rock 105 shaft, a line spacing pawl, a bell crank lever connected to said rock shaft and to said pawl and said means comprising a lever of the first order fulcrumed on said bell crank lever and operative on said key 110 controlled lever when said bell crank lever is actuated, said lever of the first order being operative automatically independently of said bell crank lever to release said key controlled lever and permit the carriage feed- 115 ing devices to reëngage.

9. In a typewriting machine, the combination of a traveling carriage, a platen thereon, carriage feeding devices, means for releasing the carriage and comprising a key 120 controlled lever, line spacing mechanism comprising a manually controlled rock shaft, a line spacing pawl and a bell crank lever connected to said pawl and to said rock shaft, means operative automatically by said 125 line spacing mechanism for actuating said key controlled lever, said means comprising a spring pressed lever fulcrumed on said bell crank lever and operative on said key con-

trolled lever, and means for automatically 130

. actuating said spring pressed lever to re-

lease said key controlled lever.

10. In a typewriting machine, the combination of a traveling carriage, a platen thereon, carriage feeding devices, means for releasing the carriage and comprising a key controlled lever, line spacing mechanism comprising a manually controlled rock shaft, a line spacing pawl, and a bell crank lever connected to said pawl and to said rock shaft, means operative automatically by said line spacing mechanism for autuating said key controlled lever, said means comprising a spring pressed lever fulcrumed on said bell 15 crank lever and operative on said key controlled lever, and means for automatically actuating said spring pressed lever to release said key controlled lever, stop mechanism for said carriage, and connections be-20 tween said stop mechanism and said last named means.

11. In a typewriting machine, the combination of a traveling carriage, a platen thereon, carriage feeding devices, means for 25 releasing the carriage and comprising a key controlled lever, line spacing mechanism comprising a manually controlled rock shaft, a line spacing pawl, and a bell crank lever connected to said pawl and to said rock 30 shaft, means operative automatically by said line spacing mechanism for actuating said key controlled lever, said means comprising a spring pressed lever fulcrumed on said bell crank lever and operative on said key 35 controlled lever, and means for automatically actuating said spring pressed lever to release said key controlled lever, stop mechanism for said carriage, and connections between said stop mechanism and said last named means, said stop mechanism compris- 40 ing a frame stop, a spring pressed stop bar, a stop on said stop bar co-active with said frame stop, and devices for connecting said stop bar with said spring pressed lever.

12. In a typewriting machine, the combination of a traveling carriage, a platen thereon, carriage feeding devices including a feed rack and a co-acting pinion, said rack and pinion being separable, and a spring pressed arm controllable by said feed rack, 50 said arm being provided with a camming tooth, said tooth being co-active with said pinion and exerting a camming or wedging action thereon when said rack and pinion

are separated.

13. In a typewriting machine, the combination of a traveling carriage, a platen thereon, carriage feeding devices comprising a key controlled feed dog, an escapement wheel normally engaged therewith, a feed 60 pinion rigidly connected with said escapement wheel, a co-acting feed rack, said rack and pinion being separable, a spring pressed pivoted arm controlled by said rack, and a camming tooth on said arm co-active with said pinion when said rack and pinion are separated, said camming tooth exerting a camming or wedging action on said pinion and operating to force the said escapement wheel into firm engagement with said wheel.

Signed at Hingham, in the county of Plymouth, and State of Massachusetts, this

24th day of August, A. D. 1910.

WALTER J. BARRON.

Witnesses:

ERNEST E. LINCOLN, CARRIE V. WHITE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."