

1,062,076.

W. E. BARNARD.  
TYPE WRITING MACHINE.  
APPLICATION FILED MAY 3, 1910.

Patented May 20, 1913.

2 SHEETS—SHEET 1.

Fig. 2.

Fig. 1.

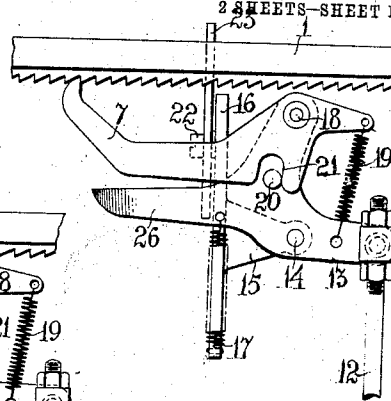
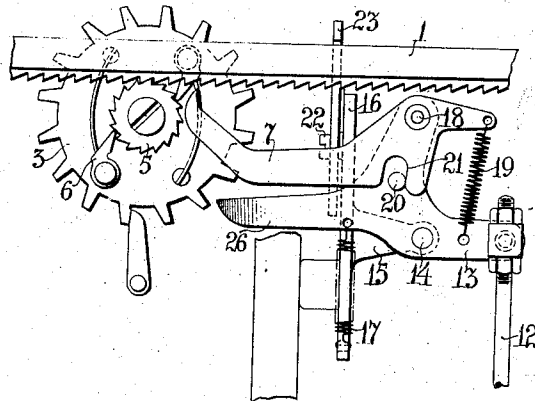
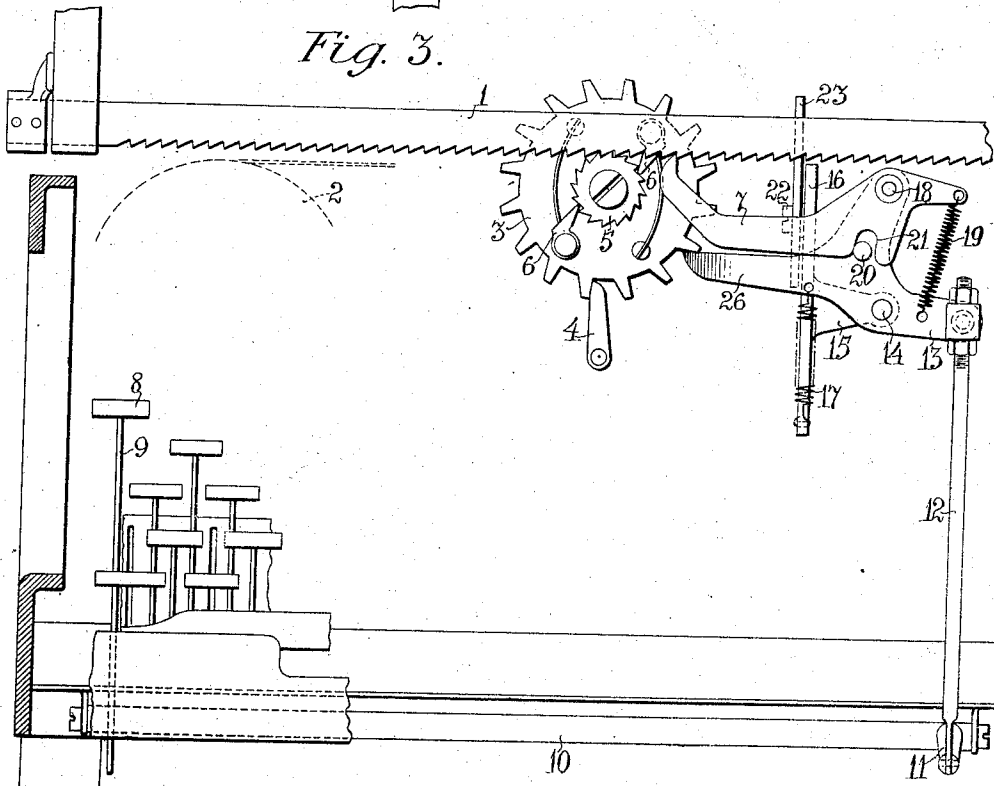


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

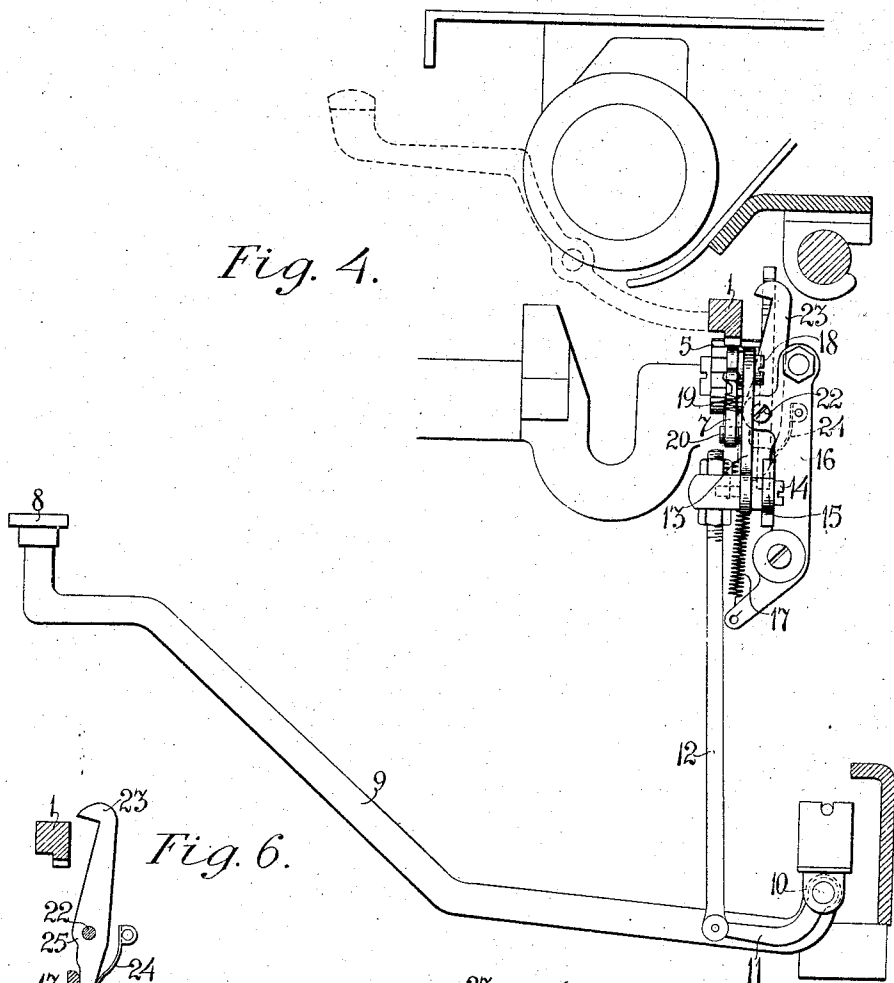


Fig. 6.

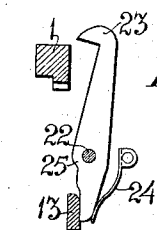


Fig. 7.

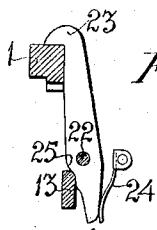
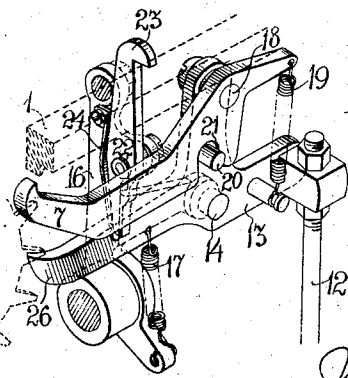


Fig. 5.



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# UNITED STATES PATENT OFFICE.

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TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

TYPE-WRITING MACHINE.

1,062,076.

Specification of Letters Patent.

Patented May 20, 1913.

Application filed May 3, 1910. Serial No. 559,153.

*To all whom it may concern:*

Be it known that I, WALTER E. BARNARD, a citizen of the United States, residing in Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to a back spacing device, or means for setting back the power-driven carriage of a typewriter spaces, ordinarily a space at a time, without other manipulation than the operation of a key on the keyboard. Back spacing devices should, upon each operation, engage the carriage rack with certainty, and act positively during the entire backward throw. During the throw, the carriage rack is preferably locked against lateral displacement by the back spacing device. The mechanism should include positive means for preventing overthrow of the carriage rack; and for returning the parts promptly and with certainty to initial position after the throw.

The object of the present invention is to meet the above requirements in a device which is simple and durable in structure, and which involves but few movements, so that the engagement and disengagement of the device and the carriage may be certain and reliable, regardless of length of service or wear of parts.

In the present invention, the device which actually throws the carriage rack is a pivoted dog operated from the key by a suitable system of levers. In the preferred form of my apparatus, the action of the dog is a pull exerted substantially in the same direction as the back throw of the carriage. It can exert little, if any, upward pressure on the carriage, and as a result is not subject to rebound or depression from the latter. It is so arranged that it cannot bind with the carriage; and its every movement is positively determined by stops.

Other objects and features of the invention will appear from the following specification taken in connection with the accompanying drawings in which:

Figure 1 is a view in front elevation, showing the normal position of the dog and certain other parts of the device with respect to the carriage rack and escapement mechanism. Fig. 2 is a similar view in front elevation, showing the relative position of the parts upon slight depression of the key,

but before the carriage has been thrown back. Fig. 3 is a view in front elevation of the parts, (including the key and connections) at the end of the throw. Fig. 4 is a view in end elevation of the parts in normal position. Fig. 5 is a detail perspective view of the principal parts of the mechanism. Fig. 6 is a view showing the lock for preventing lift of the rack, and showing in cross section the normal position of the rack and dog-supporting lever 13 with respect thereto. Fig. 7 is a view of the parts shown in Fig. 6 in the position assumed when the key is depressed.

The rack 1 is secured to the carriage and driven by the power drum 2 (Fig. 3) under control of an escapement mechanism in the usual manner. The escapement mechanism shown comprises the ratchet wheel 3, controlled by the dog 4 from the type keys, and connected to the rack, by means of pinion 5 and pawls 6. The latter permit backward spacing of the rack without movement of the wheel 3.

The rack is spaced backward by a dog 7 operated from the key 8 through key lever 9, rock shaft 10 fast thereto, arm 11 also fast to shaft 10, rod 12, and bell crank lever 13 which rocks on a fixed pivot 14 and to an upstanding arm of which lever the dog 7 is pivoted at 18. The pivot 14 of the lever 13 is carried on arm 15 of a bracket 16 fixed to the frame of the machine. A spring 17 tends to return the lever 13 and key connections to normal positions when the key is released. A spring 19 attached at one end to the dog 7 and at the other end to the lever 13, controls the movement of the dog 7 on its pivot 18. The movement of the dog 7 on its pivot 18 is limited positively by a stop pin 20 on the lever 13 which lies within a slot 21 in the dog and is permitted a limited movement or play therein.

To lock the rack against upward movement or displacement by the dog, there is pivotally mounted at 22 on the bracket 16, a hook 23, which, by means of a spring 24, is normally held in the position shown in Figs. 1, 4 and 6. The normal position of the hook 23 with respect to the dog-operating lever 13 is shown in Fig. 6, in which it will be noted the lever 13 serves as a stop to limit the backward movement of the hook under the action of the spring 24. When, however, the lever 13, upon depression of the back spacing key, is rocked clockwise on its pivot

14 from the position shown in Fig. 6 to the position shown in Fig. 7, it acts as a cam to the hook 23 to move the latter forward over the rack against the action of the spring 24.

5 A shoulder 25 on the hook, on the other hand, serves as a stop for the lever 13. When the latter is returned, the spring 24 returns the hook to normal position, as shown in Fig. 6.

10 The various movements of the dog 7 will now be more specifically pointed out. Its normal position, as heretofore stated, is as shown in Fig. 1, where it is depressed and out of engagement with the rack to permit

15 the rack to have its normal feed. This position of the dog is determined by the stop 20, against which the spring 19 causes the dog to bear in such manner that the right hand side of the slot 21 is in contact with the stop.

20 When now the rod 12 is depressed, the lever 13 and the dog turn bodily in clockwise direction about the pivot 14, the tooth of the dog swinging up sufficiently to engage it with the rack, as shown in Fig. 2.

25 The lever 13, in moving the dog into engagement with the rack, also moves sufficiently far over the cam surface on the hook 23 to bring the hook over the rack. The lever 13 does not at this time, however, engage the

30 shoulder 25 on the hook, as shown in Fig. 7. Further movement of the bell crank lever 13 around its pivot 14 causes the pivot 18 to continue moving to the right, carrying with it the dog, and also the rack with which the dog is engaged; the dog serving as a

35 hook to enable the lever 14 to draw the rack back. The dog gradually rocks on its moving pivot 18 counter-clockwise against the action of the spring 19. This movement of the dog causes the left hand side of the slot 21 finally to engage the stop 20, as shown in Fig. 3, whereupon further clockwise movement or overthrow of the lever 13, is prevented.

40 The stop 20 at this time, by preventing depression or counter-clockwise movement of the dog on its pivot 18, prevents the dog from being forced down and out by the rack. The shoulder 25 on the hook 23 is at this time engaged by the lever

45 13, and upward movement of the rack is prevented. Upon release of the back spacing key, the spring 17 moves the bell crank lever 13 toward normal position, carrying with it the dog 7; and simultaneously the

50 spring 19 moves the dog on its pivot until the stop 20 again reaches the right hand side of slot 21, whereupon the lever 13 moving farther, depresses the dog from the rack, and releases the hook 23 to enable the spring

55 24 to remove the hook from the rack, so that the parts are all again in normal position.

In order to prevent back lash of the escapement wheel 3 when the rack is back spaced, the lever 13 carries a dog 26, which

60 in the normal position of the lever 13 is out

of engagement with the escapement wheel (see Fig. 1), but which, when the lever 13 is rocked to back space, comes into engagement with one of the teeth of the escapement wheel (see Fig. 3) and holds the same against backward movement.

It will be noted from the foregoing that in back spacing the angular movement of the dog 7 is slight, and that it exerts what is practically a straight pull on the rack in the direction of movement of the latter. The stop 20 positively prevents overthrow of both lever 13 and dog, and prevents forcible disengagement of the dog from the rack; and the stop 25 is a positive stop to the clockwise movement of the lever 13. These stops are all of a character to withstand hard usage and wear.

Whereas I have shown in the drawings one form or embodiment of the invention, it will be obvious to any one skilled in the art that the structure shown is capable of considerable modification within the scope of the invention.

Having thus described my invention, I claim:

1. In a typewriting machine, a power-driven carriage having an escapement rack, a back-spacing dog normally out of engagement with the rack, a support on which the dog is pivoted, said support being also pivotally mounted in the machine, interlocking means on the dog and its support whereby the pivotal movement of the dog on its support is limited in both directions, a spring tending to turn the dog on its pivot into engagement with the rack, but normally restrained from so doing by said interlocking means in one direction, means for moving the support on its pivot to bring the dog to the rack without movement of the dog on its own pivot, and for thereafter moving the dog with the rack to back-space the latter, the rack acting during the back-spacing movement to move the dog on its pivot against the action of said spring until such pivotal movement of the dog is stopped by the engagement of the interlocking means in the other direction.

2. In a typewriting machine, a power-driven carriage having an escapement rack, a back-spacing dog normally out of engagement with the rack, a support on which the dog is pivoted, said support being also pivotally mounted in the machine, interlocking means on the dog and its support whereby the pivotal movement of the dog on its support is limited in both directions, a spring tending to turn the dog on its pivot into engagement with the rack, but normally restrained from so doing by said interlocking means in one direction, means for moving the support on its pivot to bring the dog to the rack without movement of the dog on its own pivot, and for thereafter

moving the dog with the rack to back-space the latter, the rack acting during the back-spacing movement to move the dog on its pivot against the action of said spring until such pivotal movement of the dog is stopped by the engagement of the interlocking means in the other direction, the position of the interlocking means in the latter direction with respect to the position of the pivots of the dog and its support, and with respect to the rack, being such that further movement of the support and overthrow of the rack is impossible.

3. In a typewriting machine, a power-driven carriage having an escapement rack, a back-spacing dog normally out of engagement with the rack, a support on which the dog is pivoted, said support being also pivotally-mounted in the machine, a stop on the dog support to limit the movement of the dog on its pivot toward the rack, a spring tending to turn the dog on its pivot toward the rack, but normally prevented from so doing by the stop, and means for moving the support on its pivot to bring the dog to the rack without movement of the dog on its own pivot, and for thereafter moving the dog with the rack to back-spacing position, the dog, during back-spacing movement, accommodating itself to the angular movement of the support by reason of the aforesaid spring.

4. In a typewriting machine, a power-driven carriage having an escapement rack, a back-spacing dog, a support on which the dog is pivoted, said support being also pivoted in the machine and being movable on its pivot with the dog to back-space the rack, resilient means controlling the movement of the dog on its pivot for keeping the dog from binding with the rack or becoming disengaged therefrom during the back-spacing movement, the dog being in the form of a hook which extends from its pivot in the direction of forward feed of the rack and exerts a pull on the latter in the back-spacing operation.

5. In a typewriting machine, a power-driven carriage having an escapement rack, a back-spacing dog, a support on which the dog is pivoted, said support being also pivoted in the machine and being movable on its pivot with the dog to back-space the rack, resilient means controlling the movement of the dog on its pivot for keeping the dog from binding with the rack or becoming disengaged therefrom during the back-spacing movement, the dog being in the form of a hook which extends from its pivot in the direction of forward feed of the rack and exerts a pull on the latter in the back-spacing operation, and the pivot of the dog lying substantially in a perpen-

dicular line from the pivot of the support to the rack, whereby the angular movement of the pivot of the dog with respect to the rack is slight.

6. In a typewriting machine, a power-driven carriage having an escapement rack, a back-spacing dog, means for moving the dog with the rack to back-spacing position, and means for locking the rack against displacement in the back-spacing operation, said rack-locking means having a cam bearing on said dog moving means, whereby it is operated by the latter, and having a shoulder at the end of said cam bearing to serve as a stop to determine the back-spacing movement of the dog.

7. In a typewriting machine, the combination with a carriage having an escapement rack thereon, of a pivoted dog operating member on which a back spacing dog is pivoted, a spring tending to draw said dog against said rack, an escapement wheel comprising a pinion working in said rack, a hook arranged to retain said rack in mesh with said pinion, a stop on the operating member limiting the drawing of said dog, and means for swinging said dog operating member on its pivot to move said dog against the rack and draw the carriage back.

8. In a typewriting machine, the combination with a carriage having an escapement rack thereon, of a pivoted dog operating member on which a back spacing dog is pivoted, a spring tending to draw said dog against said rack, an escapement wheel comprising a pinion working in said rack, a hook arranged to retain said rack in mesh with said pinion, a stop on the operating member limiting the drawing of said dog, means for swinging said dog operating member on its pivot to move said dog against the rack to draw the carriage back, and an extension on said operating member arranged to arrest movement of said escapement wheel.

9. In a typewriting machine, the combination with a carriage having an escapement rack, of an escapement wheel comprising a pinion working in said rack, a back spacing dog, a spring tending to swing said dog into engagement with said rack, a dog carrier on an upstanding arm of which said dog is pivoted, a second arm on said carrier arranged to lock said escapement wheel, a stop on said carrier holding said dog against the action of said spring, and means for swinging said dog carrier to cause said dog to engage said rack and draw the carriage back.

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Witnesses:

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