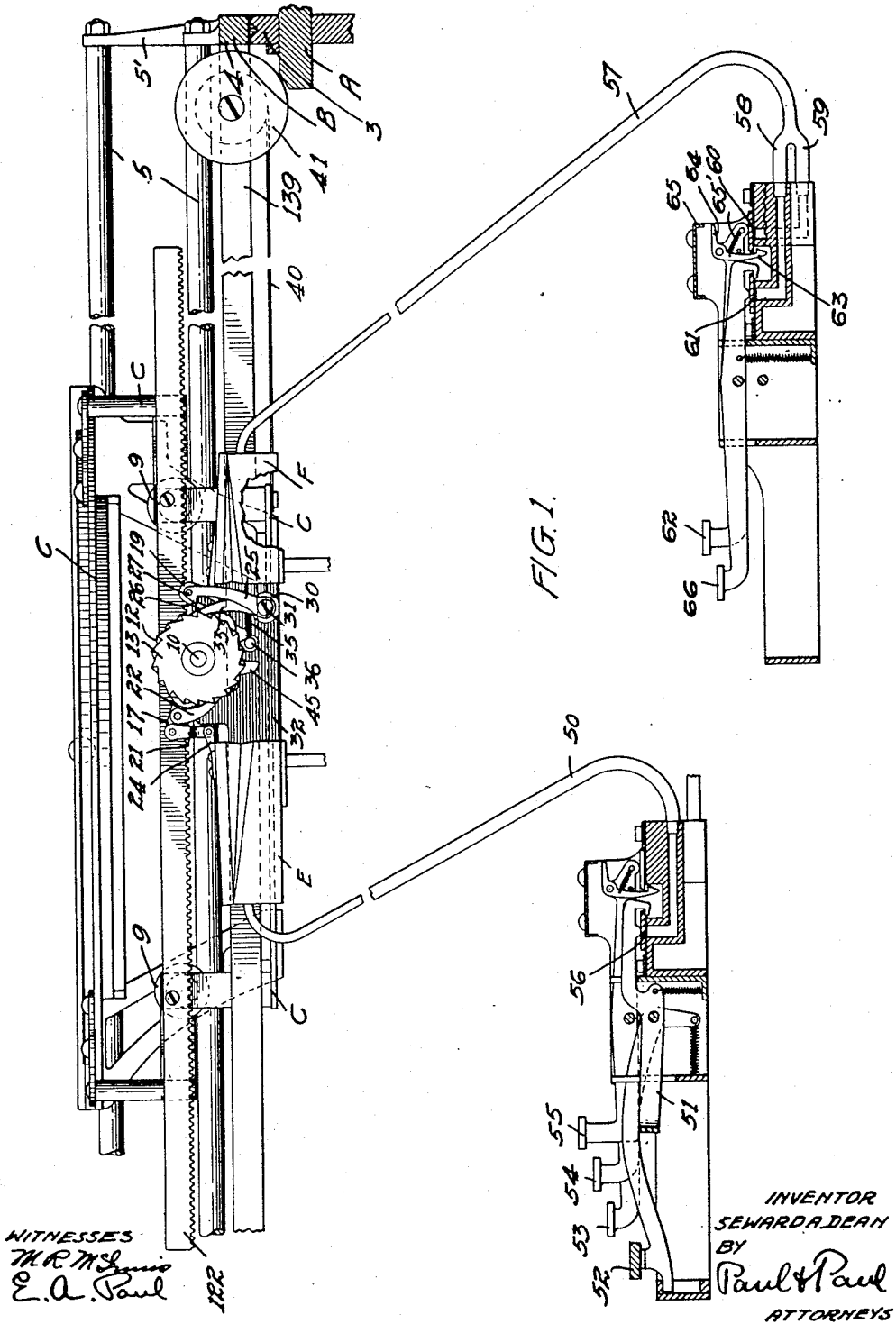


S. A. DEAN.  
 OPERATING DEVICE FOR TYPE WRITER CARRIAGES.  
 APPLICATION FILED JULY 6, 1915.

1,174,696.

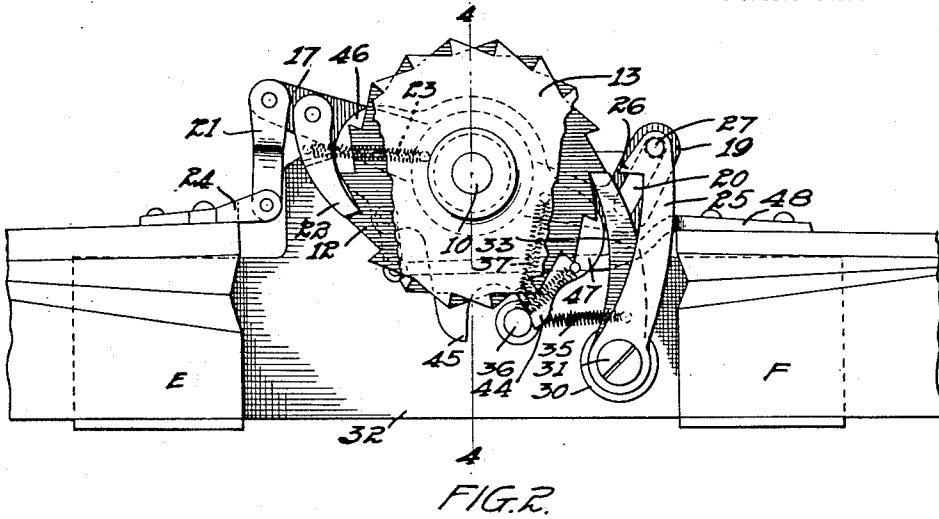
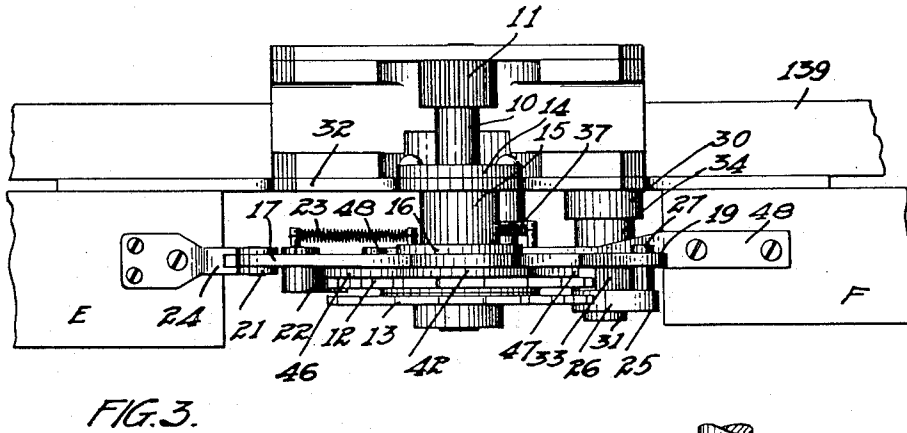
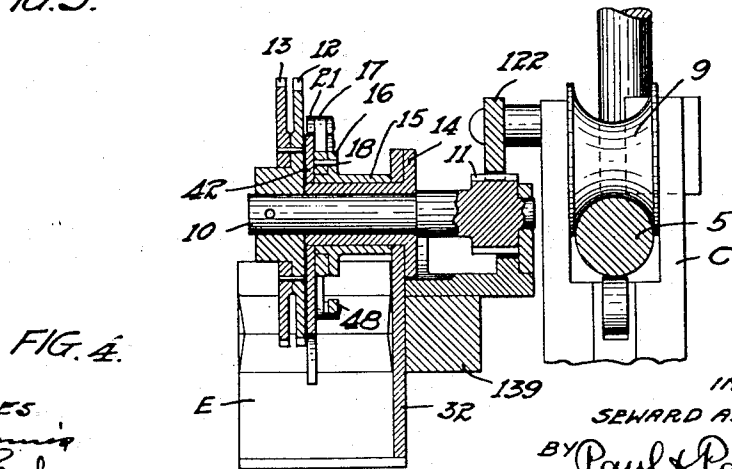
Patented Mar. 7, 1916.  
 3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 3.

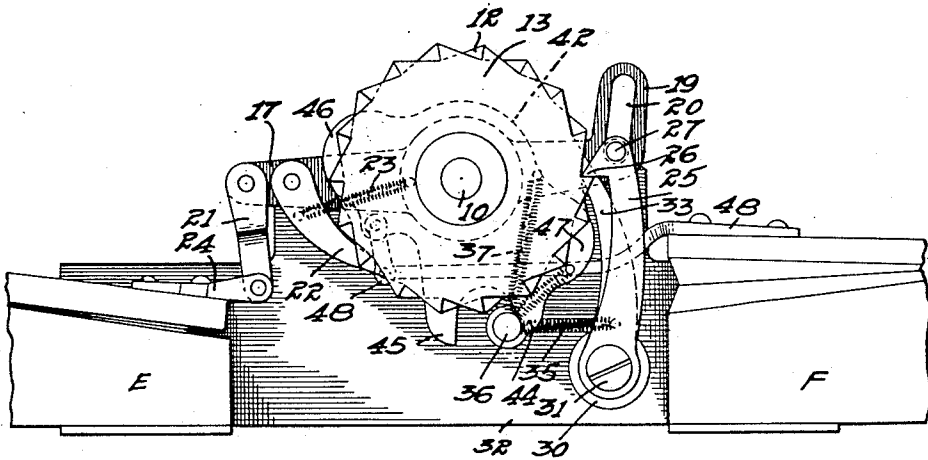


FIG. 5.

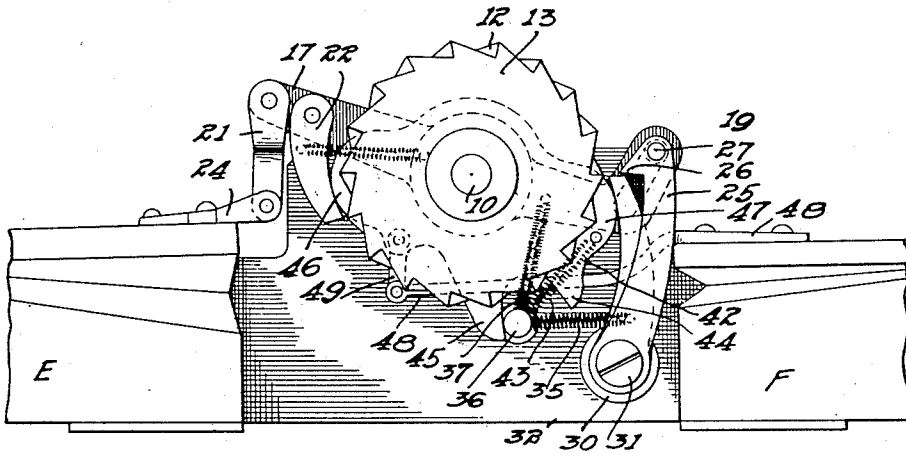


FIG. 6.

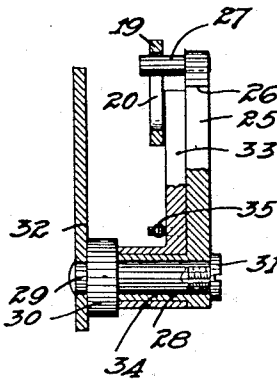


FIG. 7.

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# UNITED STATES PATENT OFFICE.

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## OPERATING DEVICE FOR TYPE-WRITER CARRIAGES.

1,174,696.

Specification of Letters Patent.

Patented Mar. 7, 1916.

Application filed July 6, 1915. Serial No. 38,148.

*To all whom it may concern:*

Be it known that I, SEWARD A. DEAN, a citizen of the United States, and resident of Hastings, Dakota county, Minnesota, have invented certain new and useful Improvements in Operating Devices for Type-Writer Carriages, of which the following is a specification.

This invention relates to improvements in devices designed to operate typewriter carriages, moving the same during the writing operation and the invention relates particularly to the class of typewriters illustrated and described in my pending application, Serial No. 1,784, filed January 12th, 1915, in which there is a stationary keyboard and a movable type carriage with the type mounted upon and moving with said carriage.

The object of the invention is to provide simple mechanism by means of which the type carriage and type carried thereby may be moved transversely one space at a time during the writing operation, and by means of which the carriage may be released and moved back one space at a time, or may be returned to its original position preferably by a suitable spring that is put under tension during the opposite travel of the carriage.

The invention consists generally in the constructions and combinations hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming part of this specification, Figure 1 is a rear elevation of a portion of a typewriter carriage with my improved operating mechanism connected therewith. Fig. 2 is a detail elevation partly broken away showing the ratchet operation and escapement device, Fig. 3 is a plan view of the part shown in Fig. 2, Fig. 4 is a transverse section on line 4-4 of Fig. 2, Figs. 5 and 6 are views similar to Fig. 2, showing the parts in the positions that they occupy in other steps of the operation, Fig. 7 is a partial section and elevation of the locking dogs.

In the drawings, A represents a portion of a suitable supporting table and B a main carriage mounted thereon, and capable of longitudinal movement on said table for the purpose of providing line spacing. The main carriage consists preferably of a suitable side bar 3, shown at the right in Fig. 1

of the drawings, and a corresponding bar (not shown) at the other end of the carriage, which bars are connected by the transverse rods 5-5, one of said rods being supported in suitable standards 5', and by a bar 139 that is preferably rectangular in cross section. The main carriage is preferably mounted upon grooved rails 3, one of which is shown at the right in Fig. 1.

The type carriage C is supported upon and guided by the transverse rods 5-5. Said carriage is preferably provided with grooved wheels 9-9, which rest upon one of said transverse rods 5 as shown in Fig. 4 of the drawings. The type carriage is also preferably provided with a suitable rack bar 122.

The above named parts may be substantially the same as the corresponding parts in the mechanism of my former application hereinbefore referred to, and I have, therefore, applied to these parts the same reference characters that are used in my said former application.

Mounted in suitable bearings preferably supported upon the bar 139 is a shaft 10 provided with a pinion 11 that engages with the teeth on the rack bar 122. When this shaft is rotated upon its axis the type carriage is correspondingly moved to the right or left across the main carriage. As the carriage is moved from left to right the printing upon the sheet arranged beneath the carriage takes place. It is desirable, therefore, to have the carriage moved one letter space as each type key or the universal space bar of the keyboard is operated. The shaft 10 has secured to it a suitable ratchet wheel 12, and a second ratchet wheel 13 having corresponding teeth turned in the opposite direction is secured to the ratchet wheel 12, so that said parts constitute in effect a double ratchet wheel with oppositely arranged teeth.

The shaft 10 passes through a sleeve 14 which is secured in a stationary position upon the frame of the main carriage and forms a long bearing in which said shaft rotates. Mounted upon the outer surface of the sleeve 14 is a freely rotating sleeve 15, preferably provided near one end with a circular flange 16. A lever 17 is provided with an opening that fits upon the sleeve 15, so as to bring said lever against the flange 16, and the lever is preferably secured upon

the flange by suitable means such as a pin 18. The lever 17 is preferably provided at one end beyond the circumference of the double ratchet wheel with an inclined arm 19, having a slot 20. The other end of the lever 17 is provided with a link 21 forming means for connecting said lever with a suitable operating arm 24 hereinafter described. The lever 17 is provided with a dog 22 arranged to engage the teeth on the ratchet 12 and to be held normally in contact with said teeth by a spring 23. A dog 25 having a hook 26 at its end is pivoted on a suitable support at the other side of the circumference of the double ratchet wheel and this dog is provided with a pin 27 that projects into the slot 20 in the arm 19 of the lever 17. This dog is arranged in the plane of the bracket 13 and is adapted when thrown forward to engage one of the teeth of said ratchet and thereby to limit the turning movement of the shaft 10.

I prefer to provide the dog 25 with a horizontally extending sleeve 28 at its lower end and to mount said sleeve upon a pin 29 having at one end a collar 30 and provided at the other end with a screw 31 that holds said dog in position upon the pin. This construction forms a broad bearing for the dog on said pin. The end of the pin 29 is preferably supported in a stationary plate 32 forming a part of the frame of the type carriage and said pin may be secured in position by upsetting its end so as to form a rivet head against said plate. The dog 25 turns freely upon the supporting pin 29 and its upper end is moved toward and from the ratchet 13 as the lever 17 is rocked by the operating arm 24.

To prevent backward movement of the ratchet wheel 12 I provide a dog 33 preferably provided with a sleeve 34 that is mounted upon the sleeve 28 of the dog 25 (see Fig. 7). A spring 35 tends to hold the upper end of this dog at all times against the edge of the ratchet 12 (see Fig. 2) thereby preventing reverse movement of the ratchet 12, when the dog 33 is in its normal position. The spring 35 has one end connected to the dog 33 and at its other end preferably connected to a pin 36, suitably supported in the plate 32.

A spring 37 is also preferably provided having one end engaging the pin 36 and the other end engaging the rear end of the lever 17. When the lever 17 is operated by the movement of the arm 24 the rear end of the lever is moved from the position shown in Fig. 2 to the position shown in Fig. 5 and the spring 37 is put under tension. When the operating arm 24 is released the spring 37 returns the lever and the parts carried thereby from the position shown in Fig. 5 to the positions shown in Figs. 2 and 6.

The function of the portions of the mecha-

nism already described is to cause the carriage as the same appears in Fig. 1 to move from right to left one step at a time through the movement of the operating arm 24, Fig. 1 being a rear elevation of a portion of the typewriter carriage. Looking at it from the front this movement of the carriage is from left to right as required in the printing operation. It is desirable, however, to provide means whereby the carriage may be returned or moved from right to left for the purpose of back spacing or to begin a new line of printing.

To return the carriage, or move it backward, I provide a suitable tape 40 having one end connected to the type carriage and having its other end connected to a spring controlled spool 41. As the carriage is moved from left to right in the printing operation the tape 40 is unwound from the spool 41 and the spring connected with said spool is wound up. If the dogs 22 and 33 are disconnected from the ratchet 12 the type carriage C will be moved backward by the power of the spring actuated spool 41. For the purpose of releasing these dogs I provide a cam plate 42 mounted upon one end of the sleeve 14 between the lever 17 and the ratchet 12 (see Fig. 4). A spring 43 is connected to this plate and also to the stationary pin 36. This spring tends normally to hold the cam plate in the position shown in Figs. 2 and 5 of the drawings. A notch is formed in the lower edge of the cam plate 42 thus providing two shoulders 44 and 45 which are at opposite sides of the pin 36. These shoulders form stops that engage the pin 36 and limit the rocking movement of said cam plate. The cam plate is provided at one end with a cam surface 46 and at the other end with a cam surface 47. Said cam plate is connected to an operating arm 48 by means of a link 49. When it is desired to free the ratchets from the dogs 22 and 33 the operating arm 48 is depressed and thereby the cam plate 42 is turned upon its bearing from the position shown in Figs. 2 and 5 to the position shown in Fig. 6. During this movement the cams 46 and 47 engage the dogs 22 and 33 and move said dogs out of engagement with the teeth of the ratchet 12 and hold them in the position shown in Fig. 6 of the drawing. The type carriage is now free to be moved backward or from right to left by means of the spring actuated spool 41.

For actuating the operating arms 24 and 48 I may provide any suitable means, such as typewriter keys having any suitable connection through said arm, whereby when the keys are operated said arms will be depressed, the movement of the arm 24 actuating the lever 17 and the movement of the arm 48 turning the cam plate 42 all as hereinbefore described. I prefer, however, to

provide in connection with each of these operating arms a pneumatic motor E similar to the pneumatic motors illustrated and described in my prior application for patent hereinbefore referred to. As here shown the operating arm 24 is connected to the top plate of one of said pneumatic motors E and as said plate is depressed in the manner described in my aforesaid application, said arm moves with it and actuates the lever 17.

In Fig. 1 of the drawings I have shown two detailed sections of a keyboard, similar to that illustrated and described in my former application. The pneumatic motor E is connected to this keyboard by means of a suitable tube 50 and I have shown at the left of Fig. 1 the tube 50 from the pneumatic motor E extending to the keyboard and connected with a duct controlled by the lever 51 that is arranged to be actuated whenever the space bar 52 or any one of the type keys 53, 54 and 55 is depressed, all as described in my aforesaid application. The lever 51 actuates the valve 56. With this arrangement of the parts whenever the space key 52 or any one of the type keys 53, 54 or 55 is operated the type carriage C is moved one letter space from left to right. Said carriage can move only one space owing to the engagement of the hook 26 on the dog 25 with the teeth of the ratchet 13, when said ratchets have been turned one notch by the operating arm 24.

I may desire to move the type carriage backward a single space only for back spacing or I may desire to move the carriage back to its original position to begin a new line of printing. I prefer to provide means connected to the operating arm 48 by which either of these movements can be effected. For this purpose I prefer to provide a pneumatic motor F similar to the pneumatic motor E and to secure the operating arm 48 to the movable plate of said motor. This motor is connected by a tube 57 extending to the keyboard and preferably having branches 58 and 59 connected with ducts that are normally closed by the valves 60 and 61. A back space key 62 is provided with a hooked dog 63 arranged to operate the valve 60. The dog 63 is provided with a short horizontal arm 64 adapted to engage a tripping plate 65 in the upward movement of the rear end of the key 62, thereby moving the lower end of the dog away from the valve against the tension of a spring 65'. With this arrangement when it is desired to move the type carriage backward one space at a time for back spacing the key 62 is depressed. The valve 60 is opened momentarily and then closed, as the arm 64 of the dog engages the tripping plate 65. This action will cause the operating arm 48 to turn the cam plate 42 into position to disengage the dogs 22 and 28 from the teeth

of the ratchet 12, and almost immediately to release said cam plate and permit it to be restored to its normal position by the spring 43. During this interval, however, the type carriage will have been moved backward a single letter space only by the action of the spring actuated spool 41, connected with the type carriage by the tape 40. If, however, the type carriage is to be returned to its original position to begin a new line of printing, a return key 66 connected with the valve 61 is actuated and the valve 61 will remain open as long as this key is depressed, and the type carriage will continue its reverse or return movement as long as said key is depressed or until the carriage reaches the limit of its return movement.

I claim as my invention:

1. Means for moving the type carriage of a typewriter for letter spacing comprising, in combination, a rack bar secured to said type carriage, a rotatable shaft having a pinion engaging said rack bar, a double ratchet on said shaft having oppositely arranged teeth on the ratchet members, a lever with its fulcrum arranged concentric with said shaft, a dog upon said lever arranged to engage the teeth of one of said ratchet members, a pivoted dog provided with a hook adapted to engage the other ratchet member, means for actuating said lever, and means connected with said lever for moving said hook into engagement with a tooth upon one ratchet member when said ratchets have been moved one step by said lever.

2. Means for moving a typewriter carriage for letter spacing, comprising, in combination, a rack bar secured to said carriage, a rotatable shaft having a pinion engaging said rack bar, a double ratchet on said shaft provided with oppositely arranged teeth, a lever having a dog arranged to engage the teeth of one of the ratchet members, means for actuating said lever, and a stop, operated by said lever, and arranged to engage the other ratchet member when said ratchet has been turned a distance equal to one tooth space.

3. Means for moving a typewriter carriage for letter spacing, comprising, in combination, a rack bar secured to said carriage, a rotatable shaft having a pinion engaging said rack bar, a double ratchet on said shaft provided with oppositely arranged teeth, a lever having a dog arranged to engage the teeth of one of the ratchet members, means for actuating said lever, a stop, operated by said lever and arranged to engage the other ratchet member when said ratchet has been turned a distance equal to one tooth space, and a dog preventing reverse movement of said double ratchet.

4. Means for moving a typewriter carriage for letter spacing, comprising, in combination,

bination, a rack bar secured to said carriage, a rotatable shaft having a pinion engaging said rack bar, a double ratchet on said shaft provided with oppositely arranged teeth, a lever having a dog arranged to engage the teeth of one of the ratchet members, means for actuating said lever, a stop, operated by said lever and arranged to engage the other ratchet member when said ratchet has been turned a distance equal to one tooth space, a dog preventing reverse movement of said double ratchet, and means for disengaging said dogs at will from said ratchet to permit a reverse movement of said carriage.

5. Means for moving a typewriter carriage for letter spacing, comprising, in combination, a rack bar secured to said carriage, a rotatable shaft having a pinion engaging said rack bar, a double ratchet on said shaft provided with oppositely arranged teeth, a lever having a dog arranged to engage the teeth of one of the ratchet members, means controlled by suitable letter and space keys for actuating said lever, a stop, operated by said lever and arranged to engage the other ratchet member when said ratchet has been turned a distance equal to one tooth space, a dog preventing reverse movement of said double ratchet, and means for disengaging said dogs at will from said ratchet to permit a reverse movement of said carriage.

6. Means for moving a typewriter carriage for letter spacing, comprising, in combination, a rack bar secured to said carriage,

a rotatable shaft having a pinion engaging said rack bar, a double ratchet on said shaft provided with oppositely arranged teeth, a lever having a dog arranged to engage the teeth of one of the ratchet members, means controlled by suitable letter and space keys for actuating said lever, a stop, operated by said lever and arranged to engage the other ratchet member when said ratchet has been turned a distance equal to one tooth space, a dog preventing reverse movement of said double ratchet, and means controlled by a suitable key for disengaging said dogs at will from said ratchet to permit a reverse movement of said carriage.

7. Means for moving a typewriter carriage for letter spacing, comprising, in combination, a rack bar secured to said carriage, a rotatable shaft having a pinion engaging said rack bar, a double ratchet on said shaft provided with oppositely arranged teeth, a lever having a dog arranged to engage the teeth of one of the ratchet members, means controlled by suitable keys arranged upon a stationary key-board for actuating said lever, a stop, operated by said lever and arranged to engage the other ratchet member when said ratchet has been turned a distance equal to one tooth space, a dog preventing reverse movement of said double ratchet, and means for disengaging said dogs at will from said ratchet to permit a reverse movement of said carriage.

In witness whereof, I have hereunto set my hand this 2nd day of July, 1915.

SEWARD A. DEAN.