Nov. 20, 1923. 1,474,839

C. W. MARSH

TYPEWRITING MACHINE

Filed Nov. 8, 1921 2 Sheets-Sheet 1

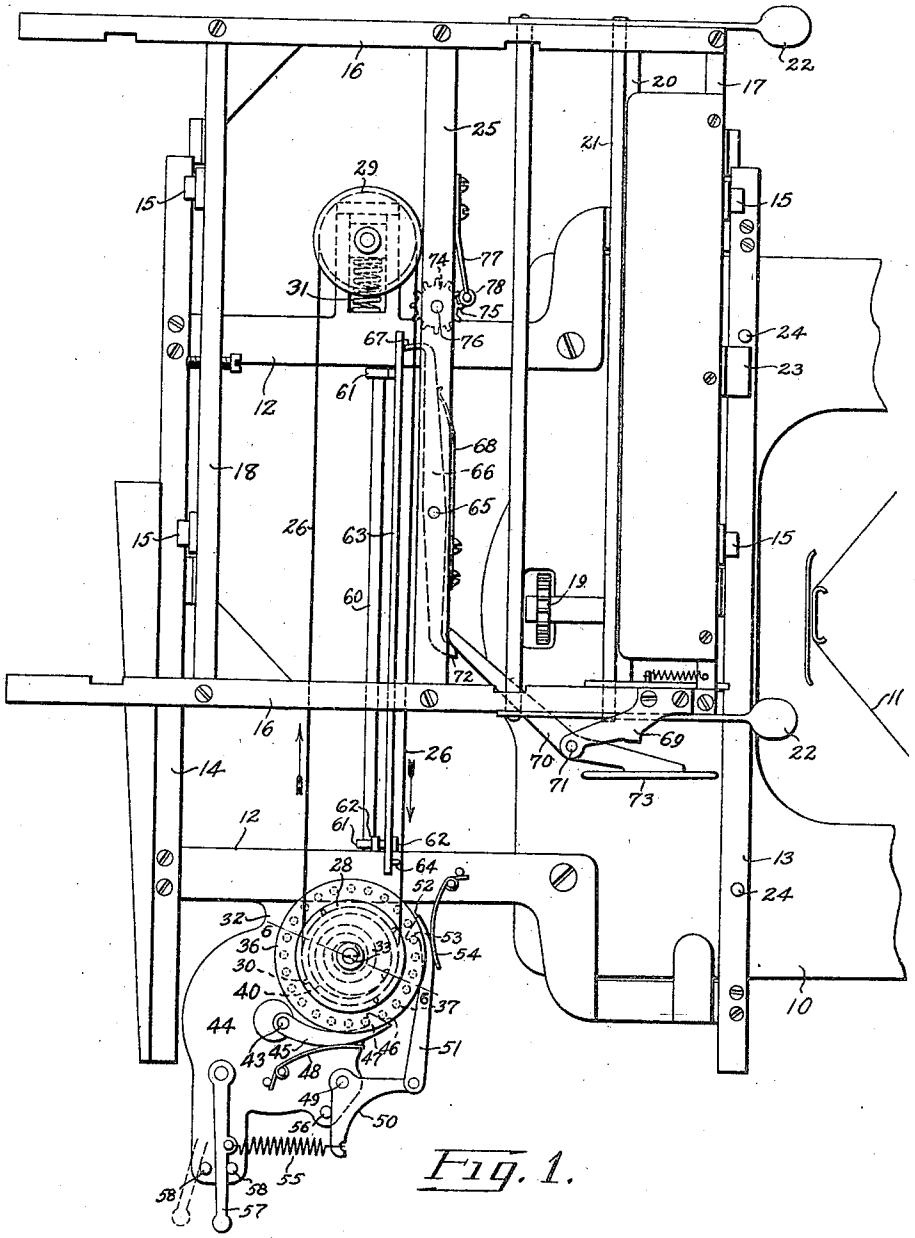


Fig. 1.

INVENTOR.
Clifford W. Marsh
BY Wooster & Davis
ATTORNEYS.

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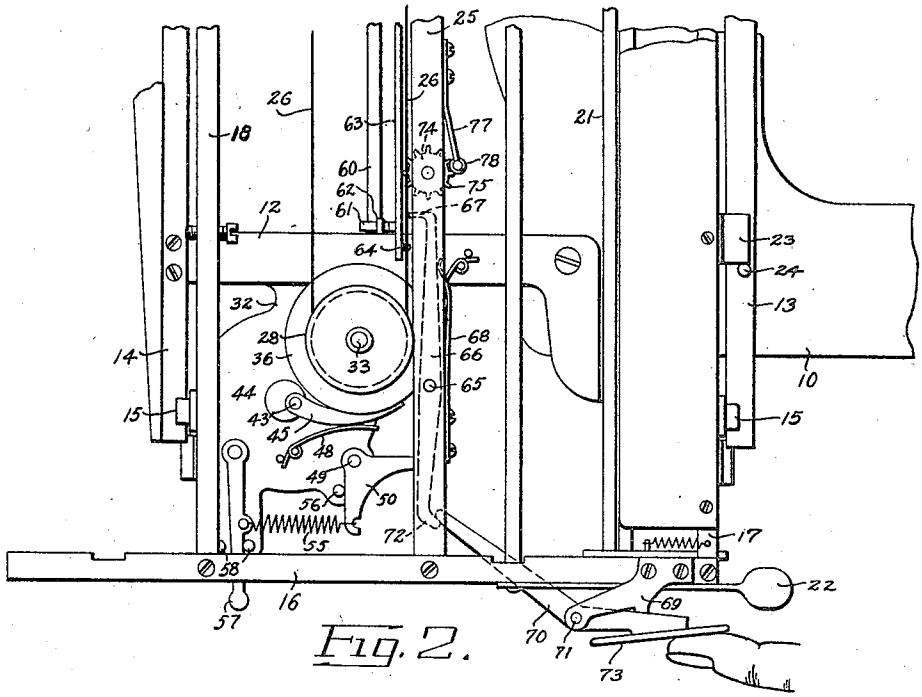


Fig. 2.

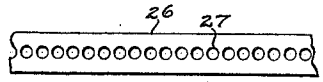


Fig. 3.

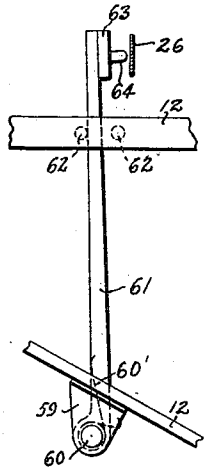


Fig. 4.

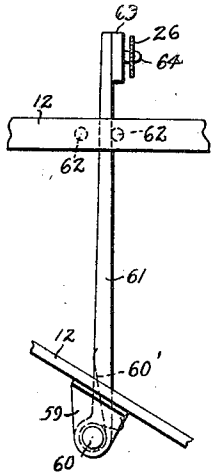


Fig. 5.

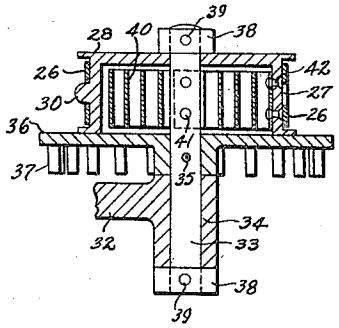


Fig. 6.

INVENTOR.
Clifford W. Marsh
BY Wooster & Davis
ATTORNEYS.

Patented Nov. 20, 1923. 1,474,839

UNITED STATES PATENT OFFICE.

CLIFFORD W. MARSH, OF BRIDGEPORT, CONNECTICUT.

TYPEWRITING MACHINE.

Application filed November 8, 1921. Serial No. 513,666.

To all whom it may concern:

Be it known that I, CLIFFORD W. MARSH, a citizen of the United States, residing at Bridgeport, county of Fairfield, State of Connecticut, have invented an Improvement in Typewriting Machines, of which the following is a specification.

This invention relates to typewriting machines and particularly to the carriage feeding mechanism therefor. It has for an object to provide means for disconnecting the tension mechanism from the carriage while said carriage is being moved from the position it occupies after a line has been written to a position for starting another line, so that during this movement the operator is not required to overcome the tension of this mechanism, but is required to use only sufficient force to move the weight of the carriage and the elements carried thereby.

It is another object of the invention to provide means to engage and hold a member of the tension mechanism when it is disconnected from the carriage to prevent unwinding of this mechanism.

It is a further object of the invention to provide a carriage feeding device in which the means for reciprocating the carriage moves always in the same direction.

It is a still further object of the invention to provide a carriage feed mechanism of this type in which there is automatic means for rewinding the tension means and maintaining a substantially constant tension thereon.

With the foregoing and other objects in view I have devised the improved mechanism illustrated in the accompanying drawings in which,

Fig. 1 is a plan view of a rear portion of a typewriter showing one form of my invention applied thereto with the parts being shown in the position they occupy when the reciprocating element is connected with the feeding mechanism.

Fig. 2 is a plan view similar to Fig. 1 but showing one-half only of the device, the elements being in the position they occupy when the reciprocating element is disconnected from the feeding mechanism.

Fig. 3 is a plan view of a section of the feeding band.

Fig. 4 is an end elevation of the means for preventing movement of the band when the reciprocating element is disconnected therefrom, said means in the figure being shown disconnected from the band.

Fig. 5 is a view similar to Fig. 4 showing the holding means in the position it occupies when connected with the band, and

Fig. 6 is a fragmentary sectional view of the means for moving the band taken on substantially the line 6—6 of Fig. 1.

The frame of the typewriter is represented by the reference numeral 10 carrying the usual type bars and keys (not shown), the typewriter ribbon being indicated at 11. Secured to the rear of the frame 10 are supporting brackets 12 carrying front and rear parallel rails 13 and 14, respectively, upon which the reciprocating element is mounted to reciprocate on rollers 15. This reciprocating element comprises end rails 16, and front and rear rails 17 and 18, respectively, connected at their ends to the rails 16 so that the reciprocating element in the device illustrated comprises a rectangular frame, as shown. This frame is adapted to receive a carrier or carriage which may either correspond to the standard carriage of a typewriter upon which the platen is mounted, or a carrier comprising, as a unit, a platen, worksheets, and transfer material, substantially as shown in my copending application Serial No. 451,611, filed March 21, 1921. As this removable carriage or carrier forms no part of my present invention, I have not illustrated the same in this application. As disclosed in said copending application, the escapement mechanism, represented by reference numeral 19, is connected with a rack 20 on the reciprocating frame to control the feeding movement thereof in the ordinary manner. The escapement mechanism is as usual manually operable to release the reciprocating element by means of an escapement release bar 21, operable by the finger levers 22 whenever it is desired to move the reciprocating element by hand. The travel of the reciprocating element in opposite directions is limited by engagement of a lug 23 carried thereby with studs 24 on the rail 13.

Extending between the end rails 16 and secured thereto, is a bar 25 upon which is

mounted means for connecting the reciprocating element with the feeding and tension mechanisms. This feeding and tension mechanism, in the embodiment shown, comprises an endless band 26, preferably of metal, which is provided throughout its extent with openings or perforations 27, Fig. 2, and is mounted on a driving drum or pulley 28 and an idler drum or pulley 29, the drum 28 being provided with projecting lugs 30 adapted to enter the perforations in the band to positively move the band when the drum is rotated. The drum 29 is mounted in movable bearings which are moved away from the drum 28 by means of suitable springs 31 to maintain the band taut.

Driving means are provided for moving the band always in the same direction and also maintaining a constant tension thereon. A supporting bracket 32 is carried by one of the brackets 12 and the shaft 33 carrying the drum 28 is mounted to rotate in a bearing 34 in this bracket. Also mounted on this shaft and secured so as to turn therewith by any suitable means, such as a pin 35, is a disc 36. Provided on one side thereof adjacent its periphery are literally extending studs or pins 37. The drum 28 is mounted to turn on the shaft 33 and this drum, the disc 36 and the bearing 34, are retained in proper relative positions by means of collars 38 secured on the shaft by any suitable means, such as pins 39. As stated above the drum 28 is mounted so that it may turn on the shaft 33, but it is connected therewith by means of a convolute spring 40, one end of this spring being secured to the shaft 33 at 41 and the other end secured to the drum at 42. It will, therefore, be apparent that if the shaft 33 is held stationary, the tendency of the spring 40 to unwind will tend to rotate the drum 28, and transmit the tension of the spring to the band 26.

Means is provided for automatically winding this spring 40 and maintaining a substantially constant tension thereon and, therefore, also on the band 26. Mounted on the bracket 32 is a suitable motor, preferably a small electric motor, constantly rotating a crank element 43, the casing of the motor being represented by numeral 44. Pivoted to the crank 43 is a pawl 45 which is provided at its free end with an inclined edge 46 and a hook 47 adjacent said incline. A spring 48 is mounted on the casing and tends to hold the pawl 45 in engagement with the pins or studs 37 on the disc 36. Also pivoted to the casing of the bracket at 49 is a bell crank 50 one arm of which is pivoted to a second pawl 51 having an inclined edge 52 and hook 53 at its free end. This pawl is also held in engagement with studs or pins 37 by means of a spring 54. To the other arm of the bell crank is connected a spring 55, and this spring tends to turn the bell crank on its pivot to pull on the pawl 51, a stop pin 56 being provided to limit this movement. The other end of the spring 55 is connected to any suitable means for varying the tension of the spring, such as a pivoted lever 57, for which is provided stops 58 to hold it in either one of different position.

The operation of this mechanism is as follows:

As the motor is rotating constantly the pawl 45 is constantly reciprocated by means of the crank 43, and as it is moved to the left, as viewed in Fig. 1, it engages a pin 37 and rotates the disc 36 in a clockwise direction, as viewed in this figure, a distance equal to the distance of the throw of the crank 43, which is substantially the same as the distance between any two adjacent pins 37. Continued movement of the crank 43 will move the pawl 45 to the right, as shown in Fig. 1, and as the disc 36 is prevented from moving in a counterclockwise direction, as viewed in this figure, by means of the pawl 51 the hook of pawl 45 will slide by and engage the next adjacent pin 37. Thus it will be evident that the disc 36 is rotated in a clockwise direction, as viewed in this figure, by a step by step movement and the spring 40 will be wound thereby. When this spring has been wound to such an extent that its tension exceeds that of spring 55, then on movement of the pawl 45 to the right as the crank 43 rotates, the pull of this spring 40 on the pawl 51 will stretch spring 55, and the hook on the pawl 45 cannot slide by the next adjacent pin 37 to engage the same. The effect of this is that so long as the tension of the spring 40 is in excess of spring 55, the disc 36 will oscillate back and forth on each revolution of the crank 43, and this action will be continued until the band 26 has been allowed to move sufficiently to unwind spring 40 to such an extent that its tension is less than that of the spring 55. When this condition occurs the spring 40 is again wound by the action of the pawl 45. It will thus be apparent that the tension on the band 26 is automatically maintained substantially constant, and that this tension may be varied by varying the tension of the spring 55.

The means for connecting and disconnecting the reciprocating element to and from the band 26 will now be described.

Mounted in brackets 59 secured to braces of the brackets 12 below the reciprocating carriage, is mounted a shaft 60 to which is secured, so as to turn therewith, two substantially vertically extending spaced levers 61 adapted to swing between a pair of stops 62 on the brackets 12, and which are connected at their upper ends by a bar 63 carrying adjacent one end thereof a pin 64

projecting at substantially right angles to the band 26, this pin being adapted to enter any one of the perforations in the band when the reciprocating element or carriage is disconnected therefrom, and to hold the band against movement. Suitable springs 60′ are provided tending to press the free end of these levers toward the band 26 and to hold the pin 64 in a perforation in the band. Pivotally mounted at 65 on the bar 25 of the carriage or reciprocating element is a lever 66 provided with a projection 67 adapted to enter in any one of the perforations in the band 26, and a suitable spring 68 tends to press this end toward the band and retain this projection in an opening therein. Fulcrumed on a bracket 69, secured to the reciprocating element, preferably the end rail 16, is a second lever 70, its pivotal point being indicated at 71. One arm of this lever is adapted to press against the curved end 72 of lever 66, and on the other arm is mounted a disc or plate 73 adapted to be engaged by the operator to swing the lever on its pivot. Also mounted upon the bar 25 is a sprocket 74 provided with teeth 75 to mesh with the perforations in the band 26, this sprocket rotating on a pivot 76. A spring 77 is secured to the bar 25 and is provided at its free end with a roller 78 riding over the teeth 75 on the sprocket 74.

The operation of this device is as follows:

After a line has been written the carriage being fed to the left or downwardly, as viewed in Fig. 1, the band 26 moving in the direction of the arrows, the carriage is moved to the right or upwardly, as viewed in Fig. 1, by the operator pressing on the plate 73. This turns the lever 70 counterclockwise, as viewed in Fig. 1, and the lever 66 clockwise to withdraw the projection 67 from engagement with the perforation in the band 26, and at the same time it allows the bar 63 to move toward the band under the action of the spring 60′ and the pin 64 to enter a perforation in the band. The lengths of the projections 67 and 64 are so proportioned that the pin 64 must enter a perforation in the band 26 before the projection 67 is withdrawn from its perforation. This arrangement prevents the carriage or reciprocating element being disconnected from the band until the holding means, represented by the pin 64 and the levers supporting the same, has been connected with the band. This holding means prevents movement of the band and unwinding of the spring 40 when the reciprocating element is disconnected therefrom. It will be apparent that when the projection 67 is withdrawn from engagement with the band, the carriage or reciprocating element is free to be moved to the right, or upwardly, as viewed in Fig. 1, to a position for the beginning of the next line. During this free movement of the carriage or reciprocating element the sprocket 74 rotates, and when the end of the free movement is reached, the action of the spring 77 and roll 78, as it tends to seat between two teeth 75, will position the reciprocating element or carriage so that the projection 67 will be in line with a perforation 27 in the band 26, and as the operator removes her hand from the plate 73 this projection will be inserted in the band by the action of the spring 68. As the spring 68 is stronger than the springs 60′ the end of the projection 67 presses against the bar 63 and withdraws the pin 64 of the holding mechanism from the band, so that now the band is free to move under the action of the spring 40 and to feed the carriage or reciprocating element forwardly under the control of the escapement mechanism 19. It is to be noted that the projection 67 does not press against the bar 63 until it has been inserted in a perforation 27, and so cannot withdraw the pin 64 and release the band from the holding mechanism until the carriage or reciprocating element has been connected with the band.

It will be apparent from the foregoing description that, after a line has been written and it is required to move the carriage backwardly to write the next line, it is disconnected from the feeding or tension mechanism, and that the operator in moving the carriage backwardly is not required to shift the same against the tension of the feeding mechanism, but that the carriage is free to move independently thereof, and the operator has to overcome only the friction of the supporting means for the carriage. This mechanism is especially valuable in use for machines having a comparatively heavy carriage which requires greater tension on the feeding mechanism to properly feed the same in rapid operation.

It will further be apparent that this connecting and disconnecting means is very simple in construction and, therefore, is not liable to be easily gotten out of order.

Having thus set forth the nature of my invention, what I claim is:

1. The combination in a typewriter having a tension mechanism and a reciprocating element, of means to connect said element and tension mechanism for movement of said element in one direction, and means to disconnect the same to allow the free movement of said element in the opposite direction.

2. The combination in a typewriter having a tension mechanism and a reciprocating element, of means to connect said element and tension mechanism for movement of said element in one direction, means to disconnect the same to allow the free

movement of said element in the opposite direction, and automatic means to put tension on said tension mechanism.

3. The combination in a typewriter having a tension mechanism and a reciprocating element, of means to connect said element and tension mechanism for movement of said element in one direction, means to disconnect the same to allow the free movement of said element in the opposite direction, and means to prevent movement of the tension mechanism when the said element is disconnected therefrom.

4. The combination in a typewriter having a feeding device and a reciprocating element, of means to connect said element and feeding device for movement of said element in one direction, means to disconnect the same to allow free movement of said element in the opposite direction, and means controlled by said disconnecting means for preventing feeding movement of said device when said element is disconnected therefrom.

5. The combination in a typewriter having a tension mechanism and a reciprocating element, of means to connect said element and tension mechanism for movement of said element in one direction, means to disconnect the same to allow the free movement of said element in the opposite direction, and means controlled by said disconnecting means for preventing movement of said tension mechanism when said element is disconnected therefrom.

6. The combination in a typewriter, of a reciprocating element, a feeding mechanism comprising a perforated band and means for moving the band, means adapted to enter one of said perforations to connect said element and the band for movement of said element in one direction, and means for withdrawing said means from said perforation to allow free movement of said element in the opposite direction.

7. The combination in a typewriter, of a reciprocating element, a feeding mechanism comprising an endless band and means for moving said band, means adapted to connect the element and the band for movement of said element in one direction, and means for disconnecting the element from the band to allow free movement of the element in the opposite direction.

8. The combination in a typewriter, of a reciprocating element, a feeding mechanism comprising a perforated endless band and means for moving said band, means carried by said element adapted to enter a perforation in the band to connect the element and the band for movement of said element in one direction, and means for removing said latter means from the perforation to allow free movement of the element in the opposite direction.

9. The combination in a typewriter, of a reciprocating element, a feeding mechanism comprising a perforated band and means for moving the band, means carried by the element adapted to enter one of the perforations to connect said element and the band for movement of said element in one direction, means for withdrawing said latter means from said perforation to allow free movement of said element in the opposite direction, and means controlled by said disconnecting means to engage the band and prevent movement thereof when said element is disconnected therefrom.

10. The combination in a typewriter, of a reciprocating element, a feeding mechanism comprising a perforated endless band and means for moving said band, means carried by said element adapted to enter a perforation in the band to connect the element and band for movement of said element in one direction, means for removing said latter means from the perforation to allow free movement of the element in the opposite direction, and means controlled by the removing means adapted to enter a perforation and prevent movement of the band when the element is disconnected therefrom.

11. The combination in a typewriter having a tension mechanism and a reciprocating element, of means to connect said element and tension mechanism for movement of said element in one direction, means to disconnect the same to allow the free movement of said element in the opposite direction, means to prevent movement of the tension mechanism when the said element is disconnected therefrom, and automatic means for maintaining a substantially constant tension on said tension mechanism.

12. The combination in a typewriter having a tension mechanism and a reciprocating element, of means to connect said element and tension mechanism for movement of said element in one direction, means to disconnect the same to allow the free movement of said element in the opposite direction, means controlled by said disconnecting means for preventing movement of said tension mechanism when said element is disconnected therefrom, and automatic means for maintaining a substantially constant tension on said tension mechanism.

13. The combination in a typewriter, of a reciprocating element, a feeding mechanism comprising an endless band and tension mechanism for moving said band, means adapted to connect the element and the band for movement of said element in one direction, means for disconnecting the element from the band to allow free movement of the element in the opposite direction, and automatic means for maintaining a substantially constant tension on said tension mechanism.

14. The combination in a typewriter, of a

reciprocating element, a feeding mechanism comprising a perforated band and tension mechanism for moving said band, means adapted to enter one of said perforations to connect said element and the band for movement of said element in one direction, means for withdrawing said means from the perforation to allow free movement of the element in the opposite direction, and means for maintaining a substantially constant tension on said tension mechanism.

In testimony whereof I affix my signature.

CLIFFORD W. MARSH.