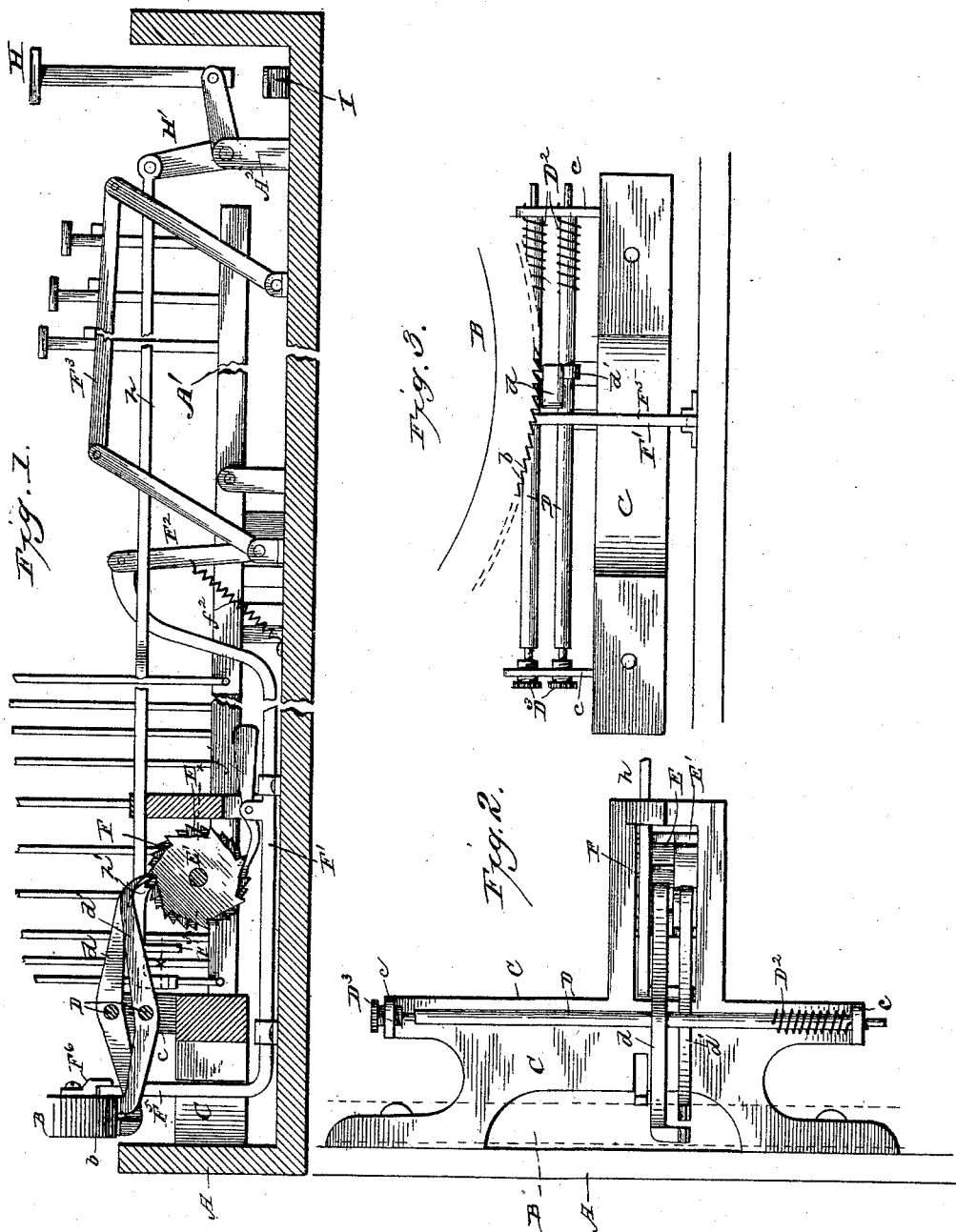


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CARRIAGE FEEDING MECHANISM FOR TYPE WRITING MACHINES.

No. 458,567.

Patented Sept. 1, 1891.



Witnesses

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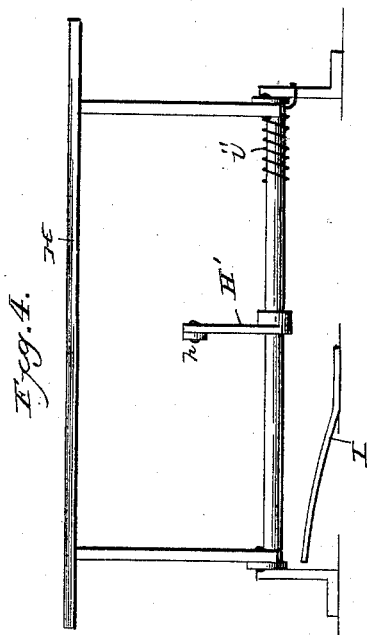
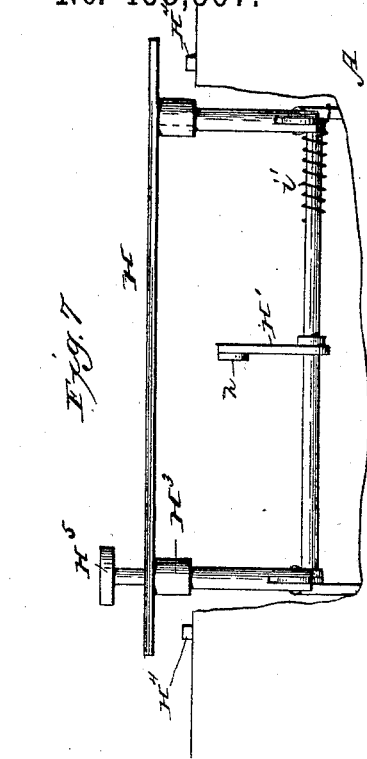
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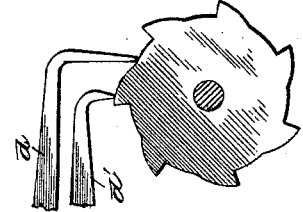
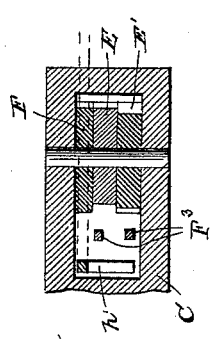
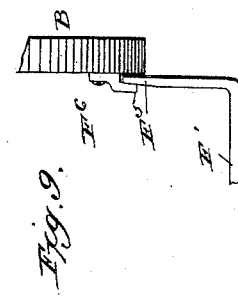
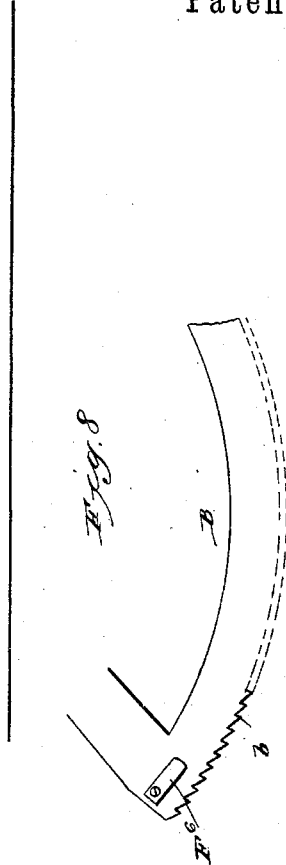
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# UNITED STATES PATENT OFFICE,

JAMES F. FRANKEY, OF DODGE CITY, KANSAS.

## CARRIAGE-FEEDING MECHANISM FOR TYPE-WRITING MACHINES.

SPECIFICATION forming part of Letters Patent No. 458,567, dated September 1, 1891.

Application filed April 12, 1890. Serial No. 347,627. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES F. FRANKEY, of Dodge City, in the county of Ford and State of Kansas, have invented certain new and useful Improvements in Type-Writing Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to improvements in type-writers, particularly such as described in my prior application, Serial No. 333,993, filed December 16, 1889, the object of the invention being to provide a feeding mechanism requiring but little or no extra pressure on the key-levers, which shall be simple, accurate, and enable the space-key to feed the platen on the downward stroke, whereby the chances of printing a letter in the space between words is reduced to the minimum.

To these ends the invention consists, primarily and broadly stated, in a type-writer having a rack-bar controlling the platen and with which two independently-movable pawls engage, and means for operating said pawls alternately by means of the key-levers.

It consists, further, in operating said pawls by means of a toothed wheel or wheels rotated by the key-levers and the teeth of which engage the pawls alternately; and it consists, finally, in certain novel details of construction and combinations and arrangements of parts to be hereinafter described, and pointed out particularly in the claims at the end of this specification.

Referring to the accompanying drawings, Figure 1 is a side elevation of a feed mechanism for type-writers constructed in accordance with my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a rear elevation of the pawls and their carriers, showing a section of the gear-segment. Fig. 4 is a rear elevation of the space-key and its frame. Fig. 5 is a horizontal section through the center of the ratchet-wheels, showing the end of the space-key bar. Fig. 6 is a view of a modified form of toothed wheel and ratchets. Fig. 7 is a detail of a modified form of independent space-key. Figs. 8 and 9 are details of a lock-

ing device for the key-levers when the platen has reached the end of its movement.

Like letters refer to like parts.

I have not deemed it necessary herein to illustrate the type-basket and type-levers, as the same form no part of my present invention, being either of the ordinary well-known types, as illustrated, for instance, in the Remington or Caligraph machines, or as illustrated in my prior application before referred to, it being sufficient to say that in the drawings A indicates the frame of the machine, and B the gear-segment pivoted on the frame and gearing with the rack on the platen similar in all respects to that described in my said application, only that in the present instance the lower arc of the segment is provided with teeth *b*, instead of the pin arrangement.

A' indicates the keys and key-levers, only a few of which are shown for the sake of clearness.

Secured to the frame A, beneath the segment, is a support or frame C, extending toward the front of the machine and provided with upwardly-extending arms *c* at each side, the extreme forward end of the support C being, if desired, connected to a cross-piece or rearward extension of the frame A.

Mounted loosely in bearings in the supports C are two horizontal shafts D, one above the other and capable of a limited longitudinal movement, and on these shafts are rigidly mounted the pawls *d* *d'*, having their pawl ends arranged in line with each other and adapted to normally engage the same tooth of the rack-bar, or more properly rack-segment *b*. As just stated, the shafts D are capable of a limited longitudinal movement, and a spiral spring D<sup>2</sup> is mounted on each shaft, one end being connected thereto and the opposite end being connected to the support C, the tendency of the spring being, first, to hold the pawls in engagement with the rack-segment by reason of its tension, and, secondly, to hold the shafts and pawls to one extreme of their movement. Thus it will be seen that the platen and gear-segment, acting under the influence of the ordinary propelling-spring, will move the pawls and shaft to

the opposite extreme of their movement against the tension of the spring  $D^2$ , and if said pawls are released alternately from engagement with the gear-segment said segment will be allowed to move forward intermittingly. The extent of such movement may be easily and conveniently regulated by forming the end bearings for the shaft in set-screws—such, for instance, as  $D^3$ —working through one of the arms  $c$ , and against which the shoulder  $c^3$  on the shaft abuts.

In order now to give the proper alternate movement to the pawls by the depression of successive keys, a wheel having teeth  $E E'$ , adapted to engage with the forwardly-extending arms of the pawls  $d d'$ , respectively, is journaled in the support  $C$ , said teeth being either formed on an integral wheel or on wheels connected together, and are arranged alternately—that is to say, the teeth  $E'$  project in line with the spaces between the teeth  $E$ , and vice versa. Thus when said wheel is rotated first one pawl is moved and then the other, such rotation being caused by the operation of the key-levers, preferably through the medium of the following instrumentalities:

Connected rigidly to or formed integral with the toothed wheels is a ratchet-wheel  $F$ , having a number of teeth corresponding to and arranged in line with the teeth  $E E'$ , and mounted in bearings in any suitable support, preferably slightly below said wheel, is a rod  $F'$ , reciprocated by means of a bell-crank lever  $F^2$ , and a grid or frame  $F^3$ , adapted to be engaged by the key-levers  $A'$ , similar to the arrangement in my before-mentioned application, and carrying at the rear end a pawl  $f'$ , the pawl end of which engages the teeth on the ratchet-wheel. The pawl is held in engagement with the ratchet-teeth, preferably by gravity, the front end being for this purpose extended and made somewhat heavier than the rear or pawl end. Now it will be seen that if the rod and pawl  $F' f'$  are given a longitudinal reciprocation corresponding in extent to the distance between the teeth on the ratchet-wheel said wheel will be rotated one tooth at a time, and at each movement one or the other of the pawls will be actuated and the platen permitted to move the desired distance. It will be further noted that a spring, such as  $f^2$ , is employed to return the rod and pawl to original position after each movement of the key-levers, and that the pawl is so arranged as to engage with the ratchet-wheel only during such return movement, the result being that when the key-levers are depressed and the impression made the platen is stationary and only moves forward during the return movement of the key-levers. The teeth  $E E'$ , it will be understood, are of sufficient width to permit of the necessary movement of the pawls without danger of said pawls moving out of contact therewith. With this arrangement it is, as just explained, impossible to permit a feed

of the platen or carriage at any time except during a return movement of the key-levers, and while such arrangement can be made operative and effective for making the spaces between the words by employing a blank key-lever it is very desirable that the spaces between words should be made by the downward movement of the space-key, and in order to accomplish this result a space-key is employed for actuating the ratchet and toothed wheels independent of the pawl  $f'$ , and during the downward stroke of said space-key lever.

$H$  indicates the space-key carried by a bell-crank lever  $H'$ , mounted in bearings in upwardly or forwardly extending arms  $a^2$  of the frame  $A$ .

$h$  is a rod connected to the upwardly-extending arm of the bell-crank lever and carrying at its rear end a pawl-point  $h'$ , which engages with the ratchet-teeth at the top of the wheel  $F$  and rotates said wheel the distance of one tooth as the space-key  $H$  is depressed. Each of the pawls  $d d'$  is provided with a downward extension  $F^3$ , around which the end of the rod  $h$  extends, as shown in Fig. 5, for the purpose of throwing both of said pawls out of engagement with the rack segment or bar when the key  $H$  is depressed an abnormal distance, thereby permitting the platen to move freely in either direction. The space-key  $H$  is held normally elevated by means of the spring  $i'$ , surrounding the shaft of the bell-crank lever  $H'$ , and having one end attached thereto and the opposite end attached to one of the upwardly-extending arms  $a^2$ , and the distance which said key shall be depressed to determine whether a space shall be made or whether the pawls shall be thrown out of engagement with the rack-segment is gaged by the relatively heavy spring-stop  $I$ , mounted on the front of the frame  $A$ , with its spring end in position to come in contact with the space-key at the moment it reaches the point where the necessary movement corresponding to an ordinary space has taken place, but will require an additional pressure sufficient to overcome the tension of the spring  $i$  to pass beyond this point, and thereby release both of the pawls to free the platen. The teeth on the bar or segment and the pawls, it will be understood, may be so shaped as to permit of the free return of the platen without the necessity of disengaging the pawls.

It is preferred to arrange the toothed and ratchet wheels, together with the bell-crank levers, at the center of the machine, as shown in Fig. 1, although such arrangement is not absolutely essential, and while I have described in detail the construction of the specific parts it is obvious that the mechanical structure of the same may be considerably changed without departing from the spirit of my invention. For instance, instead of employing two toothed wheels or lines of teeth they may be dispensed with and a single line

of teeth employed, the necessary alternate movement being secured by making the ends of the pawls of different length, as shown in Fig. 6; but care must be had in this instance to space the teeth and pawls properly or the feed will be irregular.

In lieu of the spring-stop for the independent space-key, the arrangement shown in Fig. 7 may be used. The space-key H is formed with bearings H<sup>3</sup> at each end, through which work loosely the uprights mounted on the bell-crank levers, suitable shoulders being provided thereon, on which the space-key rests, and suitable stops H<sup>4</sup>, provided on the frame, for limiting the downward movement of the space-key. One of the uprights just referred to extends up through the space-key, and is provided with a button or key H<sup>5</sup>. Thus when the space-key itself is depressed the rod h will be drawn forward until the key rests on stops H<sup>4</sup>, which is just far enough to give the proper feed, but not to disengage both pawls; but if the little supplemental key H<sup>5</sup> be depressed it will go farther and draw the rod far enough to disengage both pawls.

A very important and desirable feature in type-writers is to prevent more than one type from striking when the platen has moved to the end of the line, thereby preventing any blurring of letters by one striking over the other, to accomplish which I provide a lock for the key-levers when the platen has reached the end of its movement. The arrangement is shown in detail in Figs. 8 and 9, and consists simply of an extension of the bar F', provided at the end with a hook or engaging projection F<sup>5</sup>, which normally rests in proximity to the segment B, and a similar hook or projection F<sup>6</sup> on the said segment, which as the segment makes the last space passes in front of the hook F<sup>5</sup> and prevents the rod F' from moving forward, and of course thereby preventing any further movement of the pawl f' or of the ordinary key-levers. This mechanism may, it is obvious, be adapted and applied to any ordinary type-writer, it being for the purposes of this invention only necessary to have the lock operated by the platen at its last movement to lock the key-levers or type-bars.

Having thus described my invention, what I claim as new is—

1. In a type-writer having a platen and printing mechanism, the combination, with the rack-bar controlling the platen, of the two independent pawls engaging the rack-bar and independently movable bodily in the direction of the length of said bar, and connections between said pawls and the key-levers for operating the pawls alternately, substantially as described.

2. In a type-writer having a platen and printing mechanism, the combination, with the rack-bar, of the two pawls engaging the rack-bar and independently movable in the direction of the length of said bar, a toothed

wheel on which the pawls rest, and connections between said wheel and the key-levers, whereby the former is rotated intermittently by the movement of the latter, substantially as described.

3. In a type-writer having a platen and printing mechanism, the combination, with the rack-bar controlling the platen and two pawls, independently movable, engaging the rack-bar and movable bodily in the direction of the length of the bar to hold the platen against longitudinal movement, of the toothed wheel on which the pawls rest, the ratchet-wheel connected thereto, the reciprocating pawl engaging the ratchet-wheel, and the frame connected to the pawl and operated by the key-levers for reciprocating the same, substantially as described.

4. In a type-writer having a platen and printing mechanism, the combination, with the rack-bar controlling the platen and two independently-movable pawls engaging the rack-bar and movable bodily in the direction of the length of the bar, of the wheel having the alternately-arranged teeth for operating the pawls alternately, a frame operated by the key-levers, and a pawl operated by the frame for rotating the toothed wheel, substantially as described.

5. In a type-writer having a platen and printing mechanism, the combination, with the rack-bar controlling the platen and two pawls independently movable longitudinally of and engaging the rack-bar, of the wheel having the alternately-arranged teeth for operating the pawls alternately, the ratchet-wheel connected thereto and having a number of teeth corresponding to the number of teeth on the toothed wheel, a frame operated by the key-levers, a pawl engaging the ratchet-wheel, a rod connected to said pawl, and a bell-crank lever connecting said rod and frame, substantially as described.

6. In a type-writer having a platen and printing mechanism, the combination, with the rack-bar, independently-movable pawls engaging said rack-bar, and toothed wheel engaging said pawls to operate the same alternately, of the spring-pressed pawl operated by the character-keys for rotating the wheel during the upward stroke of the key-lever, an independent pawl, and a space-key connected thereto for rotating the wheel during the downward stroke, substantially as described.

7. In a type-writer, the combination, with the rack-bar and pawls operated by the key-levers to feed the platen during the upward movement of the key-levers, of an independent space-key and connections between the same and said pawls for operating the same during the downward stroke of the space-key, substantially as described.

8. In a type-writer having a platen and printing mechanism, the combination, with the rack-bar controlling the platen and two independently-movable pawls d d', operated

alternately by the key-levers, of a space-key and independent connections for said space-key, whereby the pawls may be operated by the upstroke of the character-key levers and the downstroke of the space-key, substantially as described.

9. In a type-writer having a platen and printing mechanism, the combination, with the rack-bar controlling the platen and pawls *d* and *d'*, engaging the rack-bar and operated by the key-levers to feed the platen during the upward movement of the key-levers, of an independent space-key and connections controlled thereby for operating the pawls during the downward movement of the key, a spring-stop for arresting such downward movement, and pins on the pawls with which the space-key connections engage, whereby said key may be depressed against the tension of said stop and the pawls elevated by means of the pins, thereby throwing the pawls out of engagement with the rack-bar, substantially as described.

10. In a type-writer having a platen and printing mechanism, the combination, with the rack-bar and complementary parts, the two independently-movable pawls engaging the rack-bar and having the downward extensions, the toothed wheel having the alternately-arranged teeth, as described, the ratchet-wheel connected thereto, the spring-pressed pawl drawn forward by the key-levers, and the spring for retracting the same and rotating the wheels, of the space-key, the independent pawl-point engaging said ratchet-wheel and connected thereto for rotating said

wheel during the downward stroke of the space-key, the rod connected to the space-key and passing around the projections on the pawls, and the spring-stop for retarding the space-key before the said rod is brought into contact with said projections, substantially as described.

11. In a feed mechanism for type-writers, the combination, with the rack-bar, of the pawls engaging therewith, mounted on the longitudinally-movable shafts, the springs for holding said shafts at one extreme of the movement and the pawls in engagement, and means for operating said pawls alternately, substantially as described.

12. In a type-writer, the combination, with the rack-bar controlling the platen, the feed-pawls, and the rod moved by the key-levers for operating the pawls, of the projection movable with the platen and engaging said rod to lock the same and prevent the key-levers from operating, substantially as described.

13. In a type-writer, the combination, with the segment B for controlling the platen, of the rod F', the feed-pawl operated thereby, the locking projection on the rod, and a co-operating projection on the segment for preventing the movement of the rod when the segment reaches the end of its movement, substantially as described.

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Witnesses:

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