

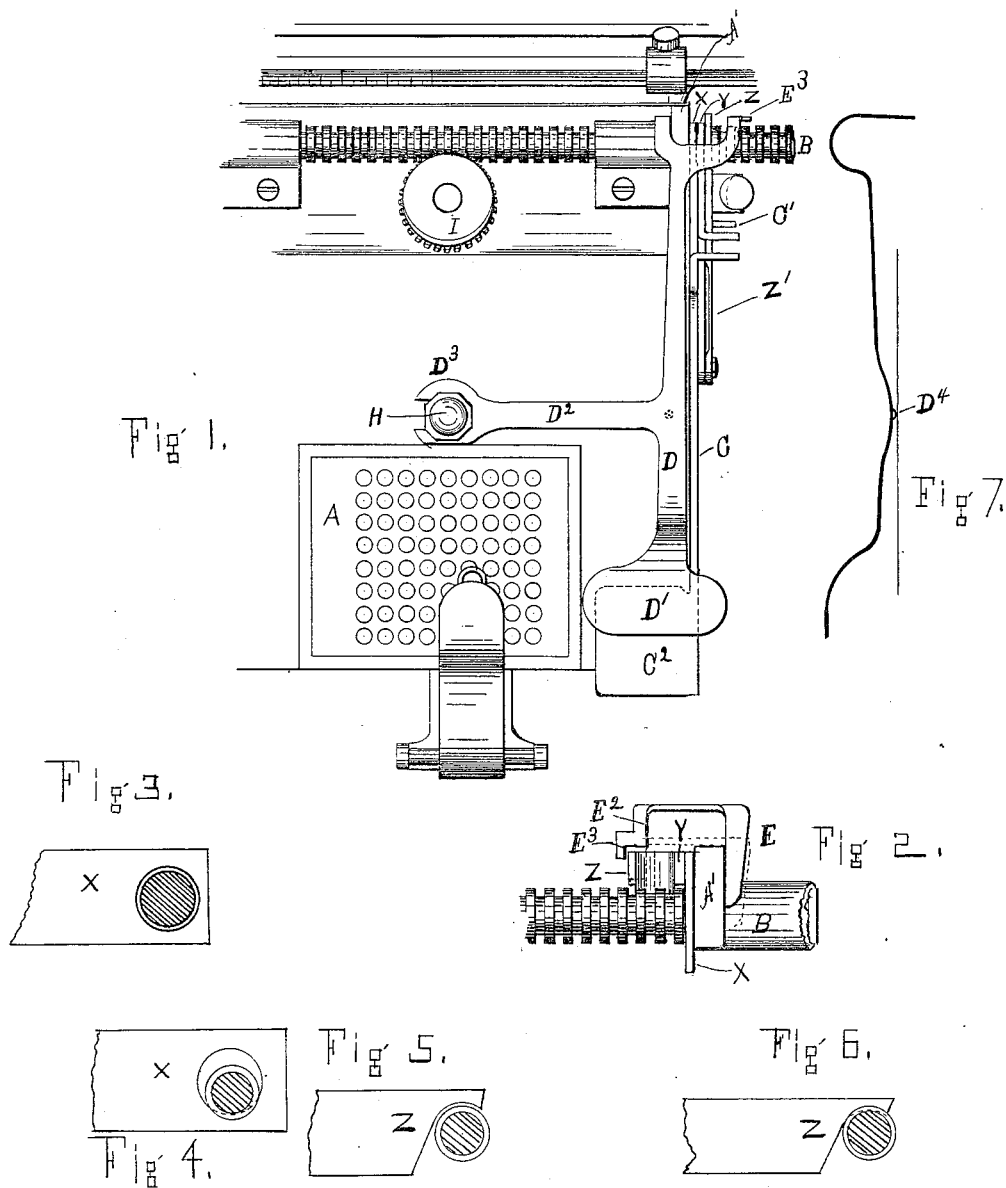
(No Model.)

J. F. STEWARD.

VARIABLE SPACING MECHANISM FOR TYPE WRITING MACHINES.

No. 344,213.

Patented June 22, 1886.



Witnesses.  
S. L. Steward  
M. W. Steward.

Inventor.  
John F. Steward

# UNITED STATES PATENT OFFICE.

JOHN F. STEWARD, OF CHICAGO, ILLINOIS.

VARIABLE-SPACING MECHANISM FOR TYPE-WRITING MACHINES.

SPECIFICATION forming part of Letters Patent No. 344,213, dated June 22, 1886.

Application filed July 14, 1884. Serial No. 137,619. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN F. STEWARD, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful  
5 Improvements in Variable-Spacing Mechanism for Type-Writing Machines, of which the following is a full description, reference being had to the accompanying drawings.

My invention relates to escape-feed mechanism for type-writers; and it consists in the devices hereinafter more fully described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a plan view of the improvement as applied to the Hall typewriter, showing as much of the latter as is necessary to illustrate my invention. Fig. 2 is an end view of the escapement springs and plates, showing their relation to the rack-bar and to my device for controlling the scope of the escapement. Figs. 3 to 6, inclusive, are details of the escapement mechanism. Fig. 7 is a side view of the device for controlling the scope of the escapement.

A is the plate of the machine, (the equivalent of what in many other forms of machine may be considered the finger-board,) adapted to vibrate vertically as pressure to produce the letter is applied to it and removed. To the edge of the bed of the carriage, beneath the plate, by means of the pin C', and free to be vibrated thereon, is the lever C. This lever passes along by the side of the bed of the carriage so far that an eye produced in its end may surround the rack-bar B, which it does loosely. The lever C at its lower end is provided with a broad horizontal surface, C', upon which the finger may be pressed. Beneath the lever to raise it is a spring. (Not shown.) The normal position of the lever is close beneath and substantially parallel with the plate A. The lever C is of such thickness at its end X as to enter into the spaces of the rack-bar, which it encircles.

Y is a plate of metal, which, as far as this invention is concerned, serves but to separate the plate X of the lever C from the spring-plate Z. The latter plate is thinned at Z', so as to have elasticity. The scope of movement of the spring-plate Z is such that when permitted it will jump to the right as far at least as two pitches of the teeth of the rack-bar B.

The movement of the lever C, produced either by the pressure of the plate upon it in printing a letter or pressure upon the lever itself, permits a feed movement of but one step at a time, one for each letter and one for the space before the following word.

D is the supplemental spacing-key—a lever located over the plate A, and having at its lower end the broad plate D' in such relation to the finger-board, as the plate A may be considered, that it may be easily reached by one or any finger that may be free, while the other or others are on the keys. This lever has a projection, D<sup>2</sup>, which terminates in a crotch, D<sup>3</sup>. Through this crotch passes the screw H, which serves to secure the lever to the plate. The lever D terminates at its upper end in a fork, which is deflected downward and spans the plates X, Y, and Z. The normal position of this lever is such that its forked end lies upon the frame-work of the machine, as shown in Fig. 2 in dotted lines. The pressure of the finger upon the broad part D' raises the forked end to the position shown in full lines in same figure. A swell, D<sup>4</sup>, on the under side of the lever, rests upon the plate A, and serves as a pivot of vibration.

To return the lever to its position of rest, a spring or its equivalent must be provided. This I accomplish by making the part D<sup>2</sup> serve as a spring, its resistance to torsion serving to return the lever to its position close over the escapement mechanism. The part E of the lever D is made straight and to drop alongside the part A' of the frame, so that it cannot be moved to the right by the escapement-spring striking it. The other fork of the lever is made with the vertical shoulders E<sup>2</sup> and E<sup>3</sup>.

In the drum I is coiled a spring which tends to rotate it, and, being toothed and made to engage the notches of the rack-bar, it serves as power for propelling the mechanism to produce lines of writing whenever this power is freed to exert itself by the escapement.

The lever C, the plates X, Y, and Z, the rack-bar B, the spring-drum I, and the part A', or equivalent detent, may be comprised under the general term "escape-feed mechanism."

When in position of rest, the plate X is so situated that, as it is raised by the depression

of the plate A, the lower margin of its eye will enter into the space of the rack-bar therebeneath. The stops or shoulders  $E^2$  and  $E^3$  are in such a position that they always form a limit to the movement of the spring-plate Z. As the plate A rises and falls in the operation of producing the letters the plates X, Y, and Z are also moved, but, of course, in a reverse direction. The end of Z in the lowermost of its positions rests in the notches of the rack-bar, as seen in Fig. 6; but as the plate is depressed it is raised out of the notches, as shown in Fig. 5. This plate being thinned at Z' and adapted to spring to the right the instant that its margin is raised above the edges of the groove in the rack-bar it will throw so far as to strike the stop  $E^2$  or  $E^3$ , whichever is in position to obstruct it, and the positions of the stops being such that the plate, when thus arrested, is immediately above the notches the spring-plate Z, when depressed, will drop into one of the notches. During the intervals of rest the plate X is in the position relative to the rack-bar (which its eye surrounds) shown in Fig. 3. Vibrating as it does simultaneously with the spring-plate Z—that is, vertically—as the latter is raised out of the notch the former is thrust into the notches from beneath, as shown in Fig. 4, and that just before Z is entirely withdrawn, so that there is always one or the other in engagement with the rack-bar, and hence the feed movement is always controlled by one or the other. When Z is withdrawn by the depression of the plate in producing a letter, it is thrown against the stop  $E^2$  one notch in advance, and when so advanced to that position the return of the plate A drops it into that. While Z is being withdrawn from the notch the margin of the eye in X is being thrust upward into the notch of the rack-bar, so that no feed-movement takes place; but upon the recoil of the plate A after the printing of the letter the plate Z is dropped into whatever notch of the rack-bar is beneath it, which, unless otherwise wished, is but one notch in advance. Thus the feed progresses one step at a time at each recoil of the parts after the printing of a letter until the last letter of the word is reached, after the printing of which two steps in advance of the feeding mechanism must be provided for. To do this, the operator has but to press upon the lever D with such finger as may be free, when the forked end of the lever will be lifted, so that the spring-plate may be free to move farther than the stop  $E^2$ , yet be stopped two steps in advance, so that the feeding mechanism may move two steps before being stopped, and the last letter of each word and first of next have the proper space between. The depression of the plate A effects the feed only through the lever C, a part of its length being beneath the

plate, so that the movement of the former shall carry the latter with it. The lever C is free to move downward, however, independent of the plate A, and hence by pressing upon it the escapement may be made to operate, and the feeding movement be produced without at the same time printing a letter. The plate D' of the lever D, I place in part over the plate C' of the lever C, so that either or both may be depressed by the same movement of the finger. This arrangement is useful especially in spacing between paragraphs, when it is desirable to move onward one or two steps before beginning the new one. If one step is wished, the lever C only is depressed; but if two steps forward are required the lever D is moved downward, and the lever C, being in part beneath it, is also carried with it and the stop  $E^2$  removed, so that the escapement will admit of two steps being taken.

The finger-plates C' and D' may be placed side by side, so that the finger may depress them simultaneously and the same result be produced; but I prefer them arranged as shown. The part or projection E above referred to is not absolutely essential to the operativeness of the other parts, as the spacing-key D may be sufficiently stiff laterally to prevent any side movement of its end; but I prefer to use the projection E, it being the most available means for resisting the action of the spring-plate Z against either of the shoulders  $E^2$  or  $E^3$  and for holding the end of the spacing-key in position.

What I claim is—

1. In combination with the type-carriage and the escape-feed mechanism, a spacing-key provided with two shoulders,  $E^2$   $E^3$ , secured to and moving with the type-carriage and extending forward in proximity to the finger-board, whereby said carriage may be shifted one or two spaces, substantially as described.

2. In combination with the escape-feed mechanism, a spacing-key provided with two shoulders,  $E^2$   $E^3$ , and a detent for preventing lateral movement of the said key, whereby the letter-plate A may be shifted one or two teeth, as desired, substantially as described.

3. In combination with the escape-feed mechanism, a spacing-key having a forked end comprising the shoulders  $E^2$   $E^3$  and the part E, substantially as described.

4. The pivoted lever comprising the following parts: plate D', spring-projection D<sup>3</sup>, having the crotch D<sup>3</sup>, a swell, D<sup>4</sup>, and a forked end having the part E and the shoulders  $E^2$  and  $E^3$ , substantially as described.

JOHN F. STEWARD.

Witnesses:

JAS. GILCHREST,  
A. HART.