

(No Model.)

3 Sheets—Sheet 1.

C. SEARS.

TYPE WRITING MACHINE FEEDING MECHANISM.

No. 585,235.

Patented June 29, 1897.

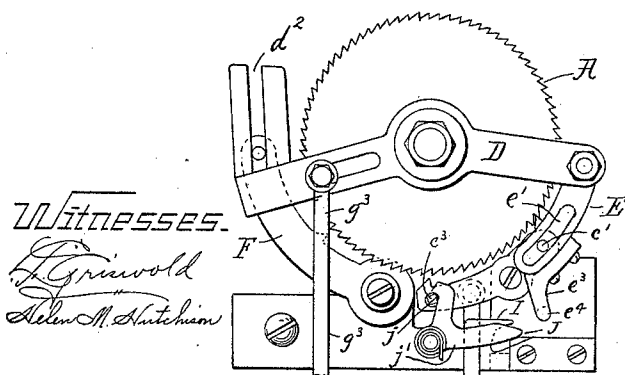
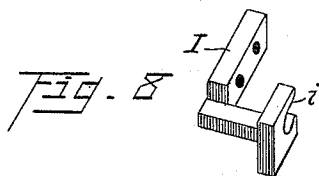
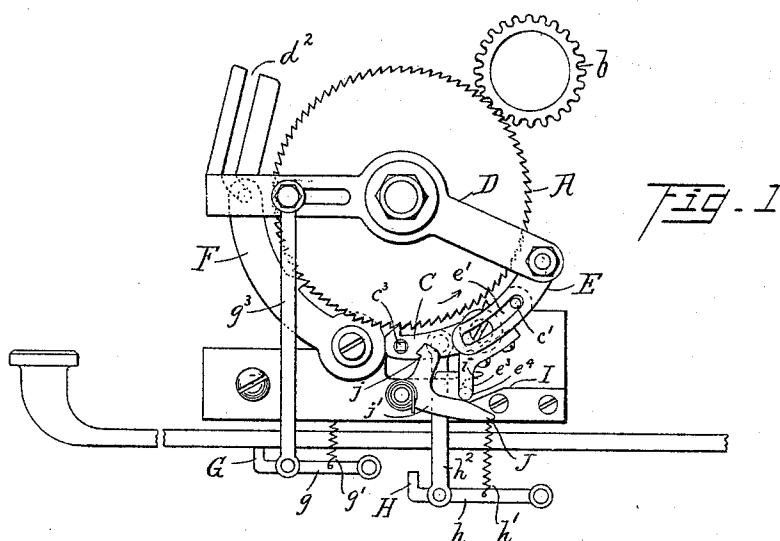


Fig. 2.

Inventor

Charles Sears

By his attorney

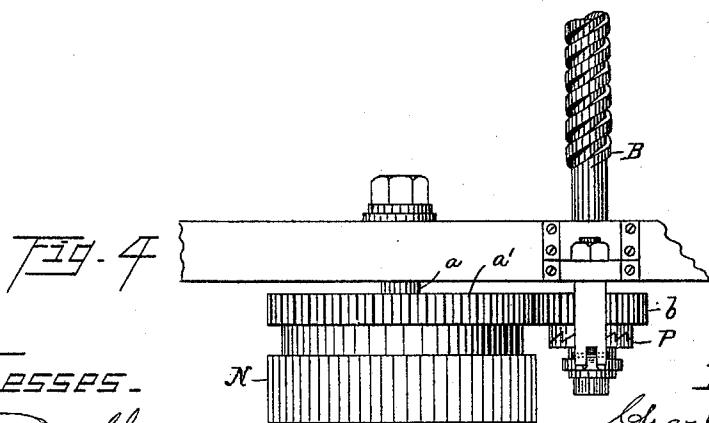
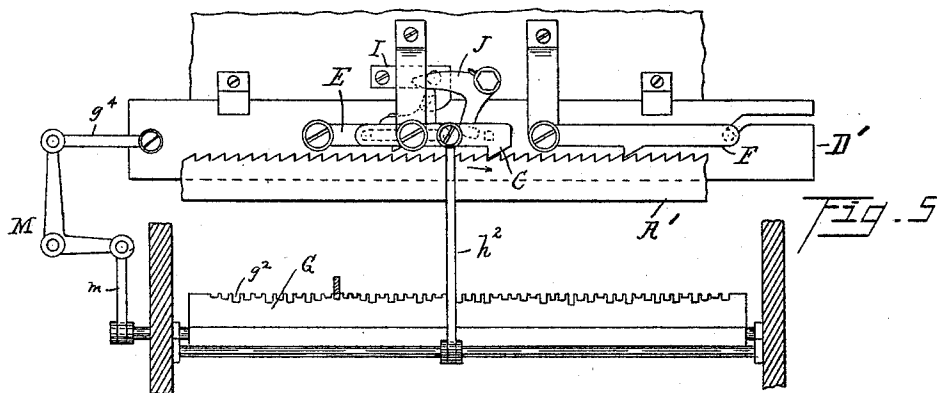
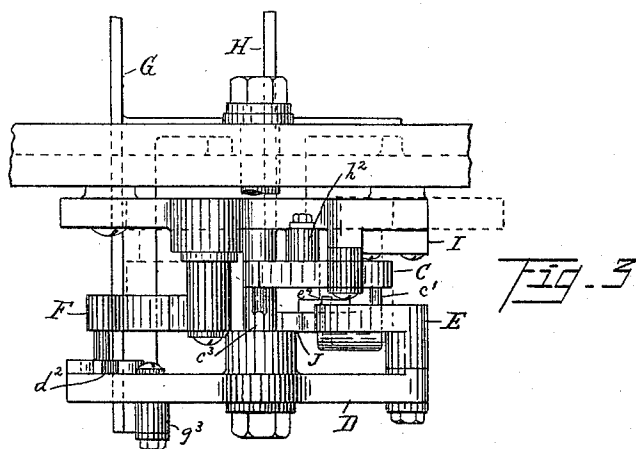
E. L. Thurston

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Witnesses.

L. G. Griswold

John M. Hutchinson

Inventor.

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(No Model.)

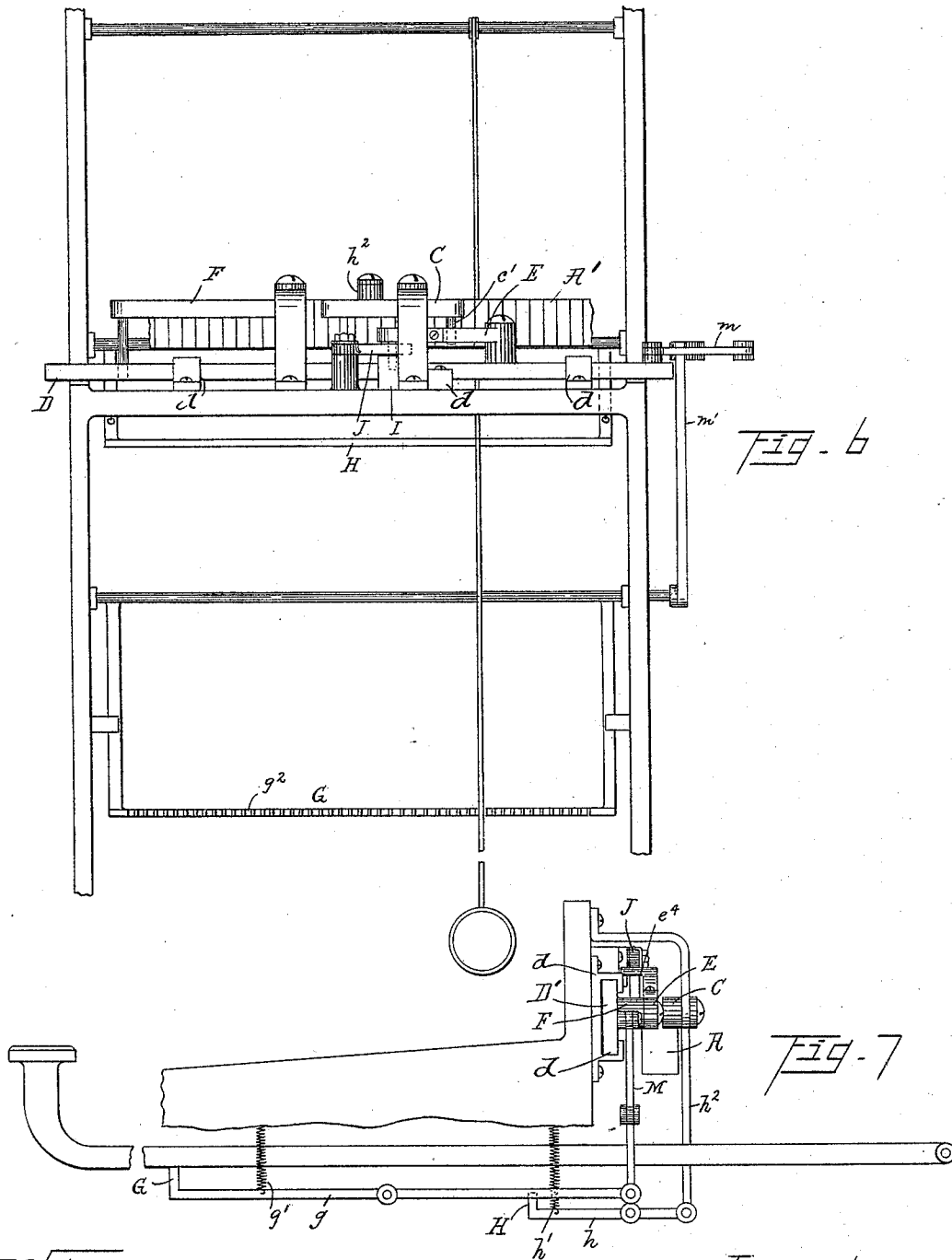
3 Sheets—Sheet 3.

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TYPE WRITING MACHINE FEEDING MECHANISM.

No. 585,235.

Patented June 29, 1897.



Witnesses.

H. Griswold
Helen M. Hutchinson

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UNITED STATES PATENT OFFICE.

CHARLES SEARS, OF CLEVELAND, OHIO.

TYPE-WRITING-MACHINE FEEDING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 585,235, dated June 29, 1897.

Application filed January 14, 1896. Serial No. 575,536. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SEARS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Feeding Mechanism for Type-Writers and Analogous Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to differential feeding mechanism for type-writers, matrix-making machines, and other analogous machines.

The object of the invention is to provide simple and effective feeding mechanism which, whenever any key is depressed, shall cause the advance of the carriage a distance proportionate to the width of the corresponding character.

The invention consists in the construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a side view of that form of my improved mechanism which is adapted to control the movement of a carriage-feeding screw, the parts being in their normal position. Fig. 2 is a side view of the same parts when they have been moved to a position to measure off a certain feed movement. Fig. 3 is a plan view of the same parts when the mechanism for transmitting motion from the ratchet to the feed-screw is shown only by dotted lines. Fig. 4 is a plan view of said transmitting mechanism. Fig. 5 is a rear view of the invention adapted for use in a writing-machine in which the movement of the carriage is controlled by a straight longitudinally-movable ratchet, the Remington machine being an example of the class. Fig. 6 is a plan view thereof. Fig. 7 is a side view thereof. Fig. 8 is a perspective detail of the cam stop-block, which serves a purpose in returning the pawls to their normal position.

The manner of constructing and mounting a suitable carriage and of connecting it either with a feed-screw or with a longitudinally-movable ratchet is well known, and consequently it has not been thought necessary to show any carriage in the drawings.

To understand the operation of the invention as illustrated in the drawings, it must be assumed that the feed-screw in one case and

the straight ratchet in the other case are subject to the continuous action of a force tending to move them in the feeding direction. The arrows on the ratchets of the two forms of the invention indicate the direction in which said parts are constantly impelled to move and do move when released by the retaining devices.

It is one of the common constructions in machines of this character to apply a tension in this manner to the carriage or to the mechanism for moving it, wherefore it is not thought necessary to show any specific mechanism for this purpose. The part in Fig. 4 indicated by N may represent a spring-barrel containing a spring for this purpose. The tension is usually applied directly to the carriage in the class of type-writers shown in Figs. 5 to 7.

Referring to the parts by letters, A represents a ratchet (shown in Figs. 1 to 4) which is circular in form. A modified form of the ratchet is shown in Figs. 5 to 7. As shown in these figures, the ratchet is straight and is indicated by A'. On the same shaft is a pinion a', which is rigidly connected with the ratchet. The feed-screw B, which is suitably mounted, carries a pinion b, which meshes with the pinion a', whereby any movement of the ratchet A results in a simultaneous and proportionate movement of the feed-screw.

The straight ratchet A' may be rigidly connected with the carriage, which is a common construction.

The movement of either the ratchet A or A' is normally prevented by a retaining-pawl C, which is pivoted to a fixed support.

D represents a movable selecting-plate having a movement which is the same in kind as the movement of the ratchet—that is to say, in that embodiment of the invention employing a ratchet-wheel the plate is pivoted on the same center as said wheel, but is adapted to move independently. In the construction shown in Figs. 1 to 3 the selecting-plate is loosely mounted on shaft a. In the embodiment of the invention containing the straight longitudinally-movable ratchet the selecting-plate, which is indicated by D', is supported in fixed brackets d, in which it may move longitudinally in a path parallel to said ratchet.

A selecting-pawl E is pivoted to the plate D, as shown in Figs. 1 to 4, and to plate D',

as shown in Figs. 5 to 7. Suitable mechanism is provided for moving the two pawls C and E into and out of engagement with the ratchet. This result is effected by means of
 5 a pin c' on the pawl C, which enters a slot e' in the pawl E. The pin c' is secured to a part of the pawl C, which extends on the opposite side of the pivot to the pawl-tooth. This construction permits the pawl E to be moved
 10 past one or more teeth of the ratchet without affecting the pawl C, but when either of the pawls is moved out of or into engagement with the ratchet the other one is caused to move in the reverse direction.

15 The plate D, as shown, receives its motion from a rocking frame which is pivoted to the sides of the machine. The frame includes a horizontal notched bar G, which extends transversely across the machine beneath all
 20 of the key-levers, and the side arms g , which are rigid with said bar and are pivoted to the sides of the machine-frame. The said frame formed by the said bar and arms is held up in its normal position relative to the key-levers by a spring or springs g' . The notches
 25 g^2 in the bar are beneath the key-levers, and their depth is inversely proportionate to the width of the characters which the key-levers operate. In the construction shown in Figs.
 30 1 to 3 this frame is connected by a link g^3 with a part of plate D, which lies on the opposite side of the center from that on which the pawl E is connected.

In the form of the invention shown in Figs.
 35 5 to 7 the plate D' is connected with one arm of a pivoted bell-crank lever M by a link m . The other arm of said lever is connected by a link m' with an arm g^4 , rigidly connected with the said frame. A second bar H lies
 40 beneath the key-levers. Its ends are secured to the arms h , which are pivoted to the fixed supports. These arms and bar form a rocking frame which is normally held up by a spring or springs h' . A link h^2 connects said
 45 frame with the pawl C. The bar H is so placed that it is not touched by a key-lever until said lever has nearly completed its downward stroke.

The downward movement of any key-lever
 50 causes a downward movement of the notched bar, and the extent of this movement is inversely proportionate to the depth of the notches or directly proportionate to the width of the corresponding character. The move-
 55 ment of the bar causes through the described connecting mechanism a proportionate movement of the selecting-plate D or D'. The movement of the plate moves the pawl E past one, two, three, four, or more teeth on the
 60 ratchet, as the case may be. Then just before the key-lever reaches the end of its stroke it strikes the bar H, and in completing its stroke it moves said bar sufficiently to cause the pawl C to be withdrawn from its
 65 engagement with the ratchet. This movement of pawl C causes a reverse movement of pawl E, and the tooth thereof engages with

one of the ratchet-teeth. The ratchet there-
 upon being freed from the retaining-pawl
 moves in the feeding direction, carrying the
 70 pawl E with it until said pawl reaches the position from which it was moved, whereupon the movement of the ratchet and pawl is stopped. Then the pawl C is rocked until it
 75 engages with the ratchet, and the pawl E is withdrawn from said engagement, and the parts are again in position to repeat the operation. The feed movement of the ratchet is always equal to the antecedent selecting or counting movement of the pawl E, which
 80 may be said to count off the number of teeth on the ratchet which correspond with the desired feed movement, and this, as before explained, is always proportionate to the width
 85 of the characters.

The feed movement of the ratchet may be stopped by the engagement of the end of the slot e' with the pin c' , and the force of the spring h' may be relied upon to return the
 pawl C into engagement with the ratchet
 90 and to withdraw the pawl E from such engagement; but I prefer to employ for these purposes a cam-block I, having an inclined or cam notch i , and an arm e^3 , rigidly secured to the pawl E, having a pin e^4 , which enters
 95 this notch. As the pawl E, moved by the ratchet, returns to its normal position this pin enters this notch and engages with the inclined edge thereof. This draws the pawl E out of engagement with the ratchet and
 100 stops it at substantially the same instant, and this movement of the pawl E causes the pawl C to move into engagement with said ratchet.

In order to make it more certain that the
 105 pawl C will be held out of engagement with the ratchet while the said ratchet is making its feed movement, I provide a spring-latch J, having a shoulder j , which is adapted to engage with a pin c^3 on the pawl C. This
 110 latch has an arm j' , which extends into the path of the pin e^4 , whereby said latch is held back when the parts are in their normal position. When the pawl E begins its movement, the latch is released and it flies for-
 115 ward and its end strikes the pin c^3 . When the pawl C is retracted, the shoulder on the latch passes over the pin and holds said pawl away from the ratchet until upon the return
 120 of the pawl E to its normal position the pin e^4 strikes said arm, thereby withdrawing said latch and permitting the movement of the pawl C.

In the invention as shown I employ a stop-
 125 pawl F as an additional means for stopping the ratchet at the desired point in case the mechanism heretofore described should fail at any time to effect said result. This pawl is therefore intended to insure greater certainty in the operation of the mechanism here-
 130 tofore described. This pawl is pivoted to a fixed support and is provided with a pin which enters a cam-slot d^2 in the selecting-plate D. When said plate begins its movement, the

slot therein causes the pawl F to be withdrawn, and just as the plate in its return movement nearly reaches its normal position said slot causes a movement of said pawl into engagement with the ratchet. Since the selecting-plate necessarily accompanies the ratchet in its feed movement, the pawl F will act unfailingly and stop the ratchet, even if the pawl E is not drawn out of and into engagement with the ratchet at the proper time.

In Fig. 4 a clutching device P of a common form is shown, whereby the pinion b, which is loosely mounted on the feed-screw, may be connected to or disconnected from said screw. This is a construction which will permit the reverse movement of the feed-screw to return the carriage to a starting-point for the beginning of a new line. Any other suitable mechanical expedient which will permit the backward movement of the carriage may be employed.

Having described my invention, I claim—

1. In feeding mechanism for type-writers and analogous machines, in combination, a feeding-ratchet, a retaining-pawl pivoted to a fixed support, a selecting-pawl capable of being moved in a path corresponding with that of the ratchet past certain of the ratchet-teeth, the key-levers, a movable bar beneath the key-levers, and mechanism operated by said bar for moving said selecting-pawl as described, and mechanism for moving the two pawls simultaneously and in reverse directions into and out of engagement with said ratchet, at both extremes of the selecting movement of said selecting-pawl, substantially as and for the purpose specified.

2. In feeding mechanism for type-writers and analogous machines, in combination, a feeding-ratchet, a retaining-pawl on a fixed support, a selecting-plate movable in a path corresponding to that of the ratchet, mechanism for so moving it different distances from its normal position, a selecting-pawl pivoted to said plate, and mechanism for moving said two pawls simultaneously in reverse directions into and out of engagement with said ratchet at both ends of the movement of said selecting-plate, substantially as and for the purpose specified.

3. In feeding mechanism for type-writers and analogous machines, in combination, a feeding-ratchet, a retaining-pawl adapted to engage with said ratchet pivoted to a fixed support and extending on both sides of its pivot, a selecting-pawl adapted to engage with the same ratchet, a movable support to which the selecting-pawl is pivoted, the key-levers, and intermediate mechanism for moving said movable support, the selecting-pawl and the part of the retaining-pawl which lies on the opposite side of the pivot from the pawl-tooth, being provided respectively with a slot and a pin which enters and is movable in said slot, and mechanism for moving one of said pawls into and out of engagement with the ratchet, thereby producing the reverse movement of

the other pawl, substantially as and for the purpose specified.

4. In feeding mechanism for type-writers and analogous machines, in combination, a feeding-ratchet, a retaining-pawl pivoted to a fixed support, a selecting-plate movable in a path which corresponds with that of the ratchet, the key-levers, a bar extending beneath said key-levers and adapted to be moved different distances by different keys, mechanism intermediate of said bar and selecting-plate for moving the latter proportionate to the movement of the former, a selecting-pawl pivoted to said selecting-plate, and mechanism for moving said two pawls simultaneously in reverse directions into and out of engagement with said ratchet, substantially as and for the purpose specified.

5. In feeding mechanism for type-writers, and analogous machines, in combination, a feeding-ratchet, a retaining-pawl pivoted to a fixed support, a movable selecting-plate, a selecting-pawl pivoted thereto, the key-levers, a movable notched bar lying beneath said key-levers, mechanism connecting it with said selecting-plate, a second movable bar lying beneath the key-levers, mechanism connecting it with one of said pawls, and mechanism connecting said pawls whereby the movement of one pawl causes the simultaneous movement of the other pawl in reverse direction into and out of said ratchet, substantially as and for the purpose specified.

6. In feeding mechanism for type-writers, and analogous machines, in combination, a feeding-ratchet, a retaining-pawl pivoted to a fixed support and extending to both sides of its pivot, a movable selecting-plate, a pawl pivoted thereto, the part of the first-named pawl on the opposite side of the pivot to the pawl-tooth and the selecting-pawl having respectively a slot and a pin projecting laterally into said slot, mechanism for moving the selecting-plate, mechanism for withdrawing the retaining-pawl, and a fixed cam-stop block for stopping the selecting-pawl on its return movement and withdrawing it from engagement with the ratchet, substantially as and for the purpose specified.

7. In feeding mechanism for type-writers, and analogous machines, in combination, a feeding-ratchet, a retaining-pawl pivoted to a fixed support, a movable selecting-plate, a selecting-pawl pivoted thereto, mechanisms for moving said selecting-plate and pawls, a stop-pawl pivoted to a fixed support, and a cam on said selecting-plate engaging with said last-named pawl for moving the same into and out of engagement with said ratchet, substantially as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES SEARS.

Witnesses:

E. L. THURSTON,
L. F. GRISWOLD.