

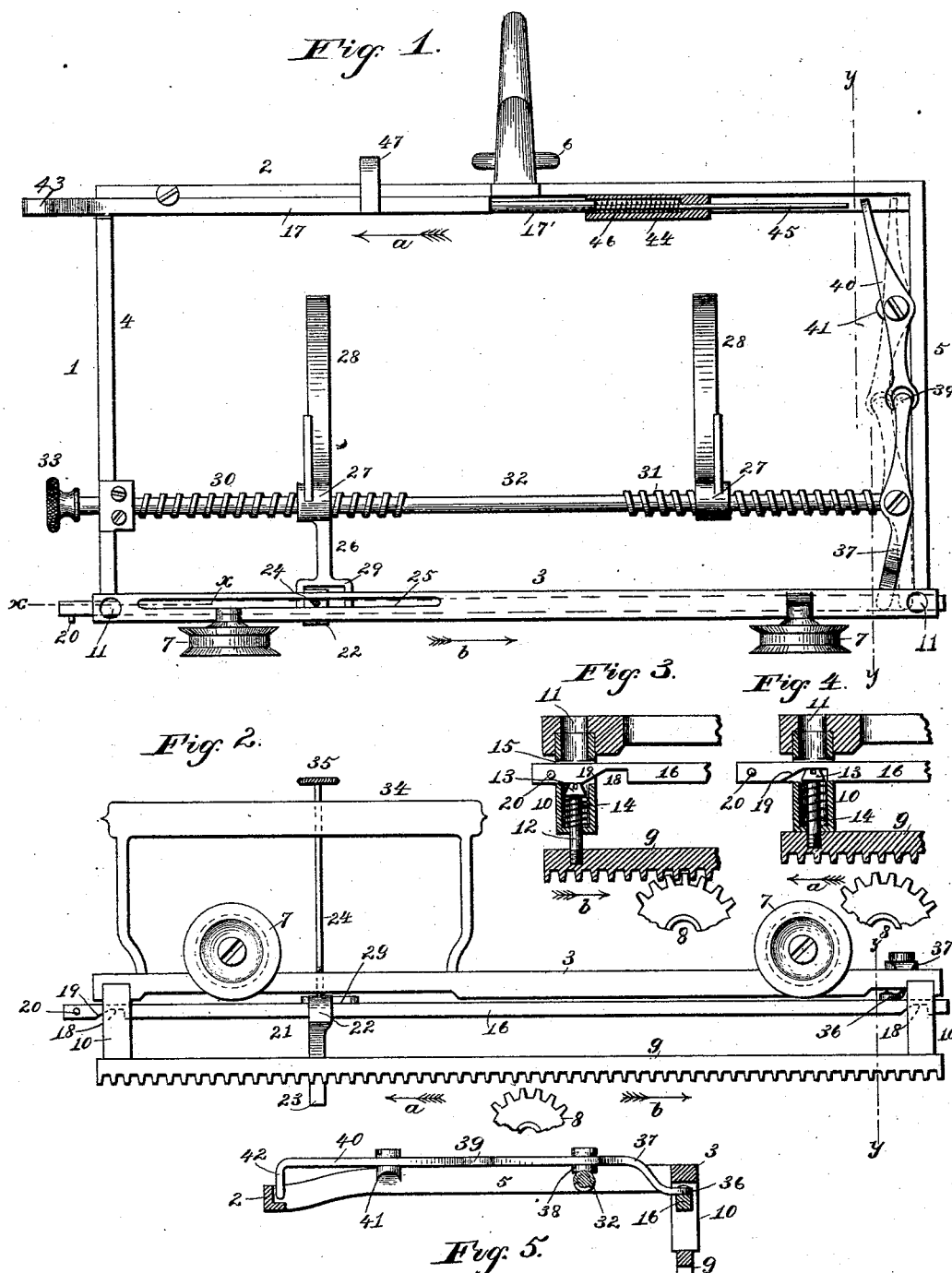
(No Model.)

J. F. McLAUGHLIN.

TYPE WRITER.

No. 421,838.

Patented Feb. 18, 1890.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES F. McLAUGHLIN, OF PHILADELPHIA, PENNSYLVANIA.

TYPE-WRITER.

SPECIFICATION forming part of Letters Patent No. 421,838, dated February 18, 1890.

Application filed May 31, 1889. Serial No. 312,780. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. McLAUGHLIN, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Type-Writers, of which the following is a specification.

This invention has reference to improvements in that class of type-writing machines in which a traveling carriage supporting the impression-cylinder is fed forward the space of one letter either automatically after each imprint of a type upon the paper or upon the depression of a specially-provided letter-spacing key.

In machines of this character, after the end of a line of writing has been reached, it is desirable that the movement of the carriage be automatically reversed and returned to its starting-point. Such automatic reverse movements I have shown in Letters Patent granted to me September 13, 1887, No. 369,954; in Letters Patent granted to me August 2, 1887, No. 367,650, and in various pending applications, notably in my application filed June 5, 1888, Serial No. 276,151, and in my application filed September 19, 1888, Serial No. 285,819. In all these cases there is a ratchet or rack bar mounted upon the traveling carriage, and a suitably-actuated feed-bar, operating either directly or indirectly the ratchet or rack bar, propels the carriage forward one letter-space after each imprint, and means are provided for disengaging the ratchet or rack bar from the actuating mechanism when the end of a line of writing is reached, so that by a suitable force, which may be supplied either by a spring or a weight, the carriage can be automatically returned to its starting-point.

In my aforesaid pending applications, and in others of like character, where a rack-bar is used instead of a ratchet-bar, there is a pinion or cog wheel normally engaging the rack-bar, and the feed-arm operates primarily to give a partial rotation to said pinion. When the end of a line of writing is reached, the rack-bar is moved out of engagement with the pinion, after which the return movement takes place; and my present invention, being an improvement upon the inventions shown in my aforesaid applications and pat-

ents, has reference to the means for throwing the rack-bar into and out of engagement with the actuating-pinion, the object being to simplify the mechanism, so as to render the movement of the rack-bar easier and to reduce the cost of the machine. All this will more fully appear from the following detailed description, in which reference is made to the accompanying drawings, which form a part thereof, and in which only so much of the carriage of the type-writer is shown as is required to a clear understanding of my specific invention.

Figure 1 is a plan view, partly in section, of the frame of the type-writer carriage suitably modified in accordance with my invention, and showing only such parts of the carriage as have a co-operative relation to the movable rack-bar. Fig. 2 is a rear elevation of so much of the carriage as is shown in Fig. 1. Figs. 3 and 4 are vertical sectional views on line *x x*, Fig. 1, showing the rack-bar in its two positions; and Fig. 5 is a sectional view on line *y y* of Figs. 1 and 2.

Like numerals of reference indicate like parts throughout all the drawings.

The frame 1 of the carriage is rectangular in shape, being composed of the front and rear bars 2 3 and the side bars 4 5, and constructed substantially in the manner described in my aforesaid applications, with such slight differences as are required to adapt the same to the special features of my present invention.

The carriage is supported at the front by an anti-friction roller 6, journaled to the front bar 2 about midway of its length and arranged, in a manner well understood by those skilled in the art to which this invention relates, to travel on a track on the main frame of the type-writer. (Not here shown.) At the rear the carriage is supported on another track or rod (not here shown) by means of anti-friction flanged rollers 7 7, suitably journaled in the rear bar of the frame, either directly or in blocks or brackets rising from the same. By preference these rollers 7 7 travel on a supporting-track, and are constructed in the manner set forth in my aforesaid application, Serial No. 300,254; but for the purposes of my present invention this is of no consequence. Thus it will appear that if not otherwise obstructed the carriage may move lon-

5 longitudinally upon its tracks from one end of
 the supporting-frame to the other, and it is
 thus moved step by step in one direction by
 the feeding mechanism actuating a pinion 8
 10 and in the other direction by a force supplied
 by a spring or weight. The pinion 8 is fitted
 for engagement with the rack-bar 9, which is
 connected with the rear bar 3 of the carriage-
 frame in the following manner: At each end
 15 of said rear bar there is secured, downwardly
 projecting from the same, a thimble 10, con-
 sisting of a square rod having a cylindrical
 bore, as shown in Figs. 3 and 4, which bore
 communicates with an opening 11, formed in
 20 the corresponding end of the rear bar 3. The
 bore in the thimble does not extend quite
 through the lower end of the same, leaving
 this end closed, except for a small hole formed
 in said end, through which passes a pin 12,
 25 the downwardly-projecting end of which is
 screw-threaded, as shown, and the rack-bar
 9 extends between these pins, to which it is
 connected. Each pin 12 is formed with a
 head 13, in which a slot is formed for the in-
 30 sertion of a screw-driver, and flat beveled
 bearing-surfaces, formed on two opposite
 sides of the head, as shown in Figs. 3 and 4,
 give to these heads the appearance of trun-
 cated cones; but, as will presently appear,
 35 only one of these bearing-surfaces is essen-
 tial. A helical spring 14 is placed within the
 thimble between the lower end of the same
 and the head 13 of the pin 12. The use of
 the openings 11 in the rear bar of the car-
 40 riage-frame will now be apparent, for it al-
 lows the insertion of a screw-driver, by means
 of which the pins 12 are screwed into the
 ends of the rack-bar. Transversely through
 the thimbles are formed rectangular slots 15,
 45 which are in alignment with each other, and
 through these slots extends the rectangular
 sliding bar 16, which is thus parallel both
 with the rear bar 3 of the carriage-frame and
 with the rack-bar 9. This sliding bar 16, be-
 50 ing mounted on the rear of the carriage-
 frame, will hereinafter be referred to as the
 "rear" sliding bar, as distinguished from the
 sliding bar 17, hereinafter described, which
 will be referred to as the "front" sliding bar.
 55 The rear sliding bar passes loosely through
 the rectangular slots 15, so that it can be
 moved longitudinally without perceptible
 friction.

60 On the underside of the rear sliding bar, and
 near each end of the same, there is formed a
 notch or recess 18, one end of which is ver-
 tical, as shown, while the other end of it is
 formed with a beveled face 19, and these two
 notches are at such distance apart that in
 65 one position of the rear sliding bar one of
 them will occupy the position within the bore
 of one thimble, while the other will be within
 the bore of the other thimble, and when the
 rear sliding bar is in this position the helical
 springs 14 will expand and will force the
 pins 12 and the rack-bar secured thereto up-
 wardly to the position indicated in Figs. 2, 4,

and 5, but most clearly seen in Fig. 4. If
 now the rear sliding bar or the carriage is
 shifted longitudinally with relation to the
 other, one of the inclined bearing-faces of
 the heads 13 of pins 12 will act as cams upon
 the inclined faces 19 of the notches 18; or
 these inclined faces may be said to act as
 cams upon the heads of the pins, whereby
 the latter will be forced downwardly against
 the tension of the helical springs 14, carrying
 with them the rack-bar, whereby the latter
 is brought to the position shown in Fig. 3.
 70 Near one end of the bar 16, and beyond the
 outer face of the corresponding thimble 10,
 there is fixed to said bar 16 a laterally-pro-
 jecting pin 20, which, when the bar 16 is dis-
 placed with relation to the carriage-frame in
 one direction, eventually comes in contact
 with the outer face of said thimble 10, and
 75 thus serves as a limiting-stop for the bar 16.
 The displacement of the bar 16 with rela-
 tion to the carriage in the other direction is
 limited by the heads 13 of the pins 12 strik-
 ing against the vertical ends of the notches
 18, as is clearly shown in Fig. 4. Thus it will
 be seen that by shifting the rear sliding bar
 longitudinally with relation to the carriage-
 frame in one direction the rack-bar 9 is de-
 80 pressed, and thus made to mesh with the pin-
 ion 8, while by shifting the rear sliding bar
 with relation to the carriage-frame in the
 other direction the rack-bar is raised, and
 thus thrown out of gear with the pinion 8.

85 As has been stated above, in the normal
 printing operation the pinion 8 is given a
 partial rotation after each imprint, or upon
 the depression of a spacing-key, as in all ma-
 chines of this character, by mechanism not
 here shown, since it forms no part of my
 present invention, so that whenever the rack-
 bar is in its depressed position the carriage
 will be fed forward intermittently to produce
 the spaces between letters and words, and if
 90 the rack-bar is in its raised position the car-
 riage will be free to be returned to its initial
 position by any suitable force, such as is sup-
 plied by a spring or weight. The means for
 thus returning the carriage to its initial po-
 95 sition are not herein shown, nor is this neces-
 sary, since for the purposes of my invention
 any suitable mechanism may be used for this
 purpose, and since my present invention is
 confined to the mechanism for raising and
 100 lowering the rack-bar when the rear sliding
 bar is shifted. The means for thus shifting
 the rear sliding bar are preferably, but not
 necessarily, the same as those shown in my
 application, Serial No. 300,254, slightly modi-
 105 fied, as will presently appear.

Mounted upon the rear sliding bar 16 is a
 casting 21, consisting of an expanded block
 22, through which a rectangular slot (not
 shown) is formed for the passage therethrough
 110 of the bar 16, and a tail-piece 23, extending
 downwardly from the expanded head, which,
 when the carriage travels in the direction of
 its feed indicated by arrow *b*, eventually

comes in contact with a fixed lug (not shown) on the main frame of the type-writer. This casting 21 is adjustable upon the rear sliding bar, and can be clamped in any adjusted position by means of a screw-rod 24, which passes through a slot 25 in rear bar 3, and through a screw-threaded hole in the upper part of the casting. The casting is adjusted upon the rear sliding bar 16 by means of an arm 26, formed on and projecting from a boss 27 of one of the two paper-guides 28 28, and provided with a forked end 29, constructed to embrace the expanded head 22 of casting 21. The prongs of this fork, however, are sufficiently far apart to allow the casting to remain relatively fixed, while the carriage, with the arm 26, may move a limited distance, as will hereinafter appear.

The paper-guides 28 are adjustable, as described in my former application, by means of right and left handed screws 30 31 on the rod 32, and passing through nuts formed in the bosses 27. The rod 32 is journaled in the side bars 4 5 of the carriage and extends beyond the bar 4, where it is provided with a milled-head 33, by means of which it may be rotated. It will now be understood that by rotating the rod 32 the paper-guides 28 will be adjusted toward and from each other, and simultaneously with such adjustment the casting will be moved along bar 16, provided the clamp screw-rod 24 has first been loosened. The screw-rod 24 is extended upwardly in front of and above the scale-frame 34, and is provided with a milled head 35, by means of which it may be manipulated. This screw-rod 24 thus serves as a pointer or indicator for the scale displayed upon the frame 34, but not shown in the drawings, because the same is engraved on the front side of the scale-plate. The point to which the casting 21 is adjusted on the rear sliding bar determines the end of the line of printing, for, according to the position of this casting on the bar 16, it will come in contact with the fixed lug on the frame of the machine hereinbefore referred to, but not shown, sooner or later, and since the paper-guides are adjusted together with the casting 21 the end of the line of writing will always have a definite relation to the edge of the paper.

To a point near the end of the rear sliding bar 16, adjacent to the side bar 5, is loosely pivoted the downwardly-projecting end 36 of a lever 37, centrally pivoted by a screw, pin, or other suitable means to a lug 38, projecting inward from the side bar 5 of the carriage. The other end of the lever 37 is connected by a knuckle-joint 39 with another lever 40, centrally pivoted to a lug 41, projecting from the side bar 5. The joint 39 may be a ball-and-socket joint, with a limited longitudinal play to permit the joined ends of the levers to pass to either side of the central line, or any other suitable joint may be used. The lever 40 has its other or free end turned downward to form a finger 42 (indicated in Fig. 5) in the line of

travel of the front sliding bar 17, mounted on the front bar 2 of the carriage-frame, and which I therefore designate as the "front" sliding bar. This front sliding bar is movable longitudinally on the inner side of the front bar 2, and passes through a bearing in the side bar 4. It is provided beyond the side bar 4 with a head 43, designed to operate the line-spacing mechanism of the machine; but neither the construction of the head nor of the said line-spacing mechanism is here shown or described, as they form no part of this invention, and are fully shown and described in my former application.

The front sliding bar 17 may be rectangular in shape throughout a portion of its length, and is then reduced to a cylindrical form, as shown at 17', which reduced portion enters a sleeve 44, fixed on the front bar 2. Beyond this cylindrical portion 17' the bar 17 is still further reduced for the remainder of its length, as shown at 45, which reduced portion extends through and beyond the end of the sleeve 44 within a short distance of the finger 42 of lever 40, and surrounded within the sleeve by a helical spring 46, abutting against the end of the sleeve and the cylindrical portion 17' of the bar, respectively. The rectangular part of the bar 17 is provided with a hook-shaped lug 47, projecting over the front bar 2, and arranged to come in contact with a stop (not shown) on the main frame of the type-writer when the carriage moves in the direction of the arrow *a*.

Assuming now that the casting 21 has been adjusted as desired and clamped to the bar 16, then as the carriage is moved forward in the direction of arrow *b* by the feed mechanism acting upon the pinion 8, with which the rack-bar 9 is then in engagement, as shown in Fig. 3, the tail-piece 23 will be brought into contact with the fixed lug on the main frame, hereinbefore referred to. This lug holds the casting and the bar 16 against further movement, while the carriage is still fed forward. During the feeding motion of the carriage the position of the levers 37 and 40 is, as indicated in dotted lines, with the free end of lever 40, a considerable distance from the end of the prolongation 45 of the front sliding bar 17; but as soon as the rear sliding bar is stopped by the engagement of the tail-piece 23 with the fixed lug on the main frame, and as the feeding motion of the carriage continues the levers 37 and 40 are turned into the position shown in solid lines by reason of the loose pivotal connection between the rear end of lever 37 and the end of the rear sliding bar. This change of position of the levers 37 40 carries the finger 42 at the free end of lever 40 within a short distance from the end of the prolongation 45 of the front sliding bar. The feeding travel of the carriage continues until the heads 13 of the pins 12 are propelled upwardly by springs 14 along the inclined faces of the notches 18, finally abutting against the vertical end of

said notches, as shown in Fig. 4. This upward movement of the pins 12 disengages the rack-bar 9 from the pinion 8, and the carriage, not being now held by the feed mechanism, is free to move backward in the direction of arrow *a* to its initial position, and it is thus moved backward by a suitable spring or weight, as shown in my former patents and applications. Before the return movement of the carriage is completed the lug 47 on the front sliding bar 17 comes into contact with the fixed stop in its path, and the said bar is held against further movement, while the carriage continues its retrograde travel. The spring 46 is thereby compressed between the end of the sleeve 44 and the cylindrical portion 17' of the bar 17, and the finger 42 of lever 40 is brought into contact with the end of the extended portion 45 of bar 17. The outer ends of the levers 37 and 40, and consequently the rear sliding bar 16, will thus be held stationary during the remainder of the retrograde movement of the carriage, while the pivots of the levers and their knuckle-joint ends will move with the carriage until these levers again assume the normal relative position shown in dotted lines in Fig. 1. The rear sliding bar 16 being held stationary, it will be seen that as the carriage carries the rack-bar along with it during the remainder of its return movement the heads 13 of the pins 12 will be forced against the inclined faces 19 of the notches 18, moving downwardly upon said inclined faces until they bear on the under side of the bar 16, thus depressing the rack-bar against the action of the helical springs 14, and again throwing said rack-bar into gear with the pinion 8, as shown in Fig. 3. When now the carriage is again moved forward, the front sliding bar 17 is returned to its normal position by the recoil of the spring 46. On the retrograde movement of the carriage the head 43, on the front sliding bar 17, will operate the line-spacing mechanism, as fully shown and described in my former application, Serial No. 285,819, which for the purposes of this case need not be considered.

It will be seen from the foregoing description that the end of a line of writing is gaged

by the position of the casting 21, while the beginning of a line of writing is gaged by the position on the main frame of the fixed stop, against which the lug 47 on the front sliding bar strikes at the end of the return movement of the carriage; but for the purposes of my present invention I am not dependent upon these means.

Having now fully described my invention, I claim and desire to secure by Letters Patent—

1. In a type-writer having a carriage-feed and automatic return mechanism, the combination, with a rack-bar movable into and out of engagement with the carriage-feed mechanism, of sliding spring-actuated supporting-pins for said bar, and a sliding bar with cam-notches to engage the ends of said pins, substantially as described.

2. In a type-writer having a carriage-feed and automatic return mechanism, the combination, with a rack-bar movable into and out of engagement with the carriage-feed mechanism, of sliding spring-actuated supporting-pins for said bar, slotted thimbles depending from the carriage-frame and receiving the said pins, and a sliding bar extending through the slots in said thimbles and provided with cam-notches to engage the ends of the pins, substantially as described.

3. In a type-writer having a carriage-feed and automatic return mechanism, the combination, with a rack-bar movable into and out of engagement with the carriage-feed mechanism, of sliding supporting-pins for said bar, slotted thimbles depending from the carriage-frame and receiving the said pins, springs surrounding the pins within the thimbles and tending to elevate the rack-bar, and a sliding bar extending through the slots in the said thimbles and provided with cam-notches to engage the ends of the pins, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES F. McLAUGHLIN.

Witnesses:

THOS. H. HUNTER,
WILSON R. KER.