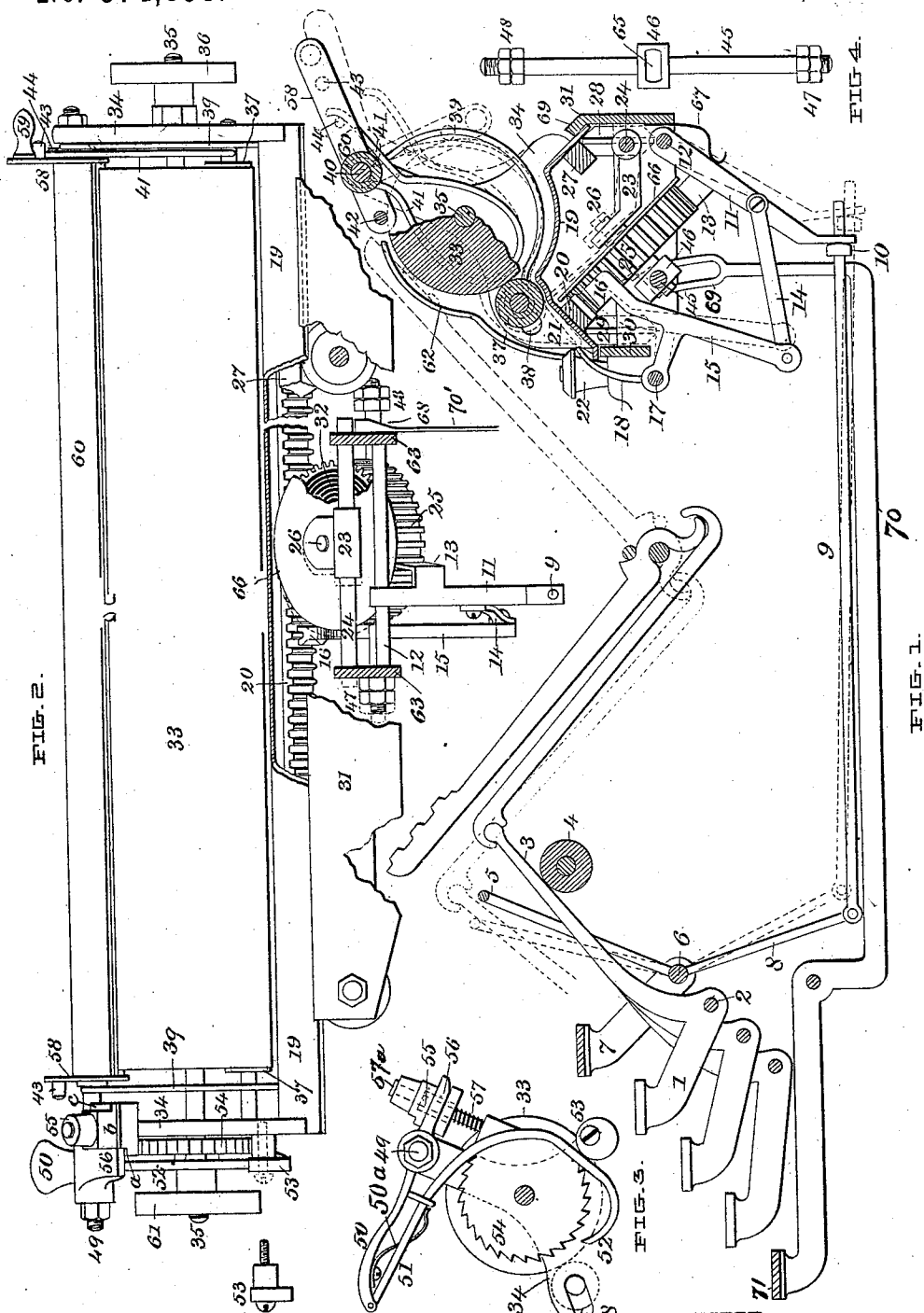


(No Model.)

W. C. FARNUM.
TYPE WRITING MACHINE.

No. 574,893.

Patented Jan. 12, 1897.



WITNESSES.

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TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 574,893, dated January 12, 1897.

Application filed August 15, 1893. Serial No. 483,183. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM CARLTON FARNUM, of the town of Arlington, in the county of Bennington and State of Vermont, have invented certain new and useful Improvements in Type-Writers, of which the subjoined description, in connection with the accompanying drawings, constitutes a specification.

10 The subject-matter of this patent relates to the paper-carriage and special devices for applying the power for the propulsion of the same, embracing a specially-constructed escape-movement and novel devices for handling the paper and regulating the line-feed.

15 The various branches of the invention are fully elaborated in the drawings, wherein I have shown a side elevation, partly in section, of the devices embodying my improvements in Figure 1. Fig. 2 shows a rear elevation of the same, parts broken away. Fig. 3 is an end elevation of the platen-roller with the line-feeding devices attached. Fig. 4 is a detached detail view of a sliding bar upon 25 which the driving spring-barrel is mounted.

I have shown in the drawings only such parts of the machine as serve to illustrate the invention and only enough of framework as is necessary to support or furnish bearings 30 for the various parts constituting the elements of my invention.

The platform of the paper-carriage is shown at 19 and is a plate shaped to the form shown in cross-section in Fig. 1. The front and rear edges of this platform are bent down to form one side of an inverted-V-shaped way on each margin of the platform. The other or back side of the front way is formed by the edge of the rack 20, and the groove thus 40 formed runs on the upper edges of the roller 29. The opposite way is made by attaching a bar 27 to the under side of the platform, as seen in Fig. 1, and this way runs on the top of the roller 28. The rear edge of the platform is prevented from getting off its proper bearings on the rollers 28 by an overlapping guard or gib 69. This is an important device to prevent displacement of the carriage on its back traverse preparatory to printing a new line and is not liable to disengagement from the carriage, being integral therewith. A sufficient number of these rollers to sustain

the carriage properly in any position of its traverse are provided. At each end of this platform an upright end piece is erected, 55 which end pieces furnish the bearings for the platen-roller and the friction contact-rolls, which rotate in contact with the platen-roller and confine the paper being operated on. The platen-roller 33 carries a knob 36 or 61 60 at either end of its shaft, whereby it may be rotated in either direction. The journals of the lower roller 37 are carried in elongated slotted bearings 38 of the end pieces 34 of the carriage-frame, so that the roll 37 may be 65 forced back out of contact with platen-roll 33. This is accomplished by means of two bent springs 39 39, one end of each of which is coiled around the axis of roll 37 and the other around the pivot-bar 40. Bar 40 is 70 firmly attached at each end to the frame, and upon it the tube 60 is fitted to turn. This tube has attached to it at each end an arm 58 58, which carries the grip-wire 42. This tube and end pieces thus constitute a grip- 75 ping-frame. This grip-wire is held in normal contact with roller 33 or against the paper held between itself and the platen-roller 33 by means of spring 41, which is attached to the platen-roller shaft or to some part of the 80 framework of the machine by one end, while its free end bears against a projection 44 of the arm 58 in a direction to force the grip-wire against the paper. The separation of roller 37 from the platen-roll 33 is effected by 85 depressing handle 59 of lever 58, which lifts the grip-wire 42 off the roller 33, and by depressing lever 58 to the dotted position seen in Fig. 1 carries lugs 43 down against the back side of the bow-springs 39, and by crowding 90 them forward thrusts the journals of roller 37 forwardly in their slotted bearings, and thereby effects the separation of the platen and the press-roll, as indicated.

At the right-hand end of the platen as it 95 stands before the operator is a line-feed ratchet 54, which is actuated by lever 50 (pivoted on the frame at 49) and pawl 51. The point 52 of this pawl engages the teeth of the ratchet on its under side and may be held in 100 such engagement constantly by means of a retractile spring 50^a, or such spring may be dispensed with, and when it is desired to move the ratchet the pawl can be put in engage-

ment with the ratchet by simply pinching the lever 50 and the pawl 51 together, the effect of which is to lift the point 52 into engagement with the teeth. A small eccentric back-stop, adjusted by a set-screw 53, is provided to adjust or limit the back fall of the pawl, so that its point, when thrown into action, will catch the tooth properly. The line-feed space is regulated by a space-block 55, which is fitted to slide vertically and turn around upon stud 57^a; but as far as the other features of this invention are concerned this is not an essential, as the same purpose may be accomplished by means of the eccentric back-stop 53. This space-block has several steps on its various sides, as seen at *a*, *b*, and *c*, Fig. 2, arranged to coincide with the teeth of the ratchet, and the projecting lip 56 of the lever 50 is adjusted to act upon the upper side of whichever of these steps is turned, so as to fall under it. The block 55 is chambered on its under side to receive the upper end of the expanding-spring 57, which acts to force the block upwardly. This block may be depressed while the lever 50 is held, so that lip 56 is out of contact with any of the steps, and can then be turned so as to bring a different step under the lip. When lever 50 is raised, the block 55 is depressed until it strikes the spring-seat, and the limit and extent of this movement, as well as that of ratchet 54, depend upon which of the steps, a high or a low one, is under lip 56. A guide-plate 62 is provided above roll 37 to direct the sheet of paper during its insertion in the machine from roll 37 up to and under the grip-wire 42.

During the normal process of printing the carriage is propelled by means of a hollow escapement-pinion gear 25, which I have termed "scape-wheel," and which is actuated by an internally-coiled spring 32, Fig. 2, and meshes with the rack 20, which is an appurtenance of the carriage. This scape-wheel turns on a stud 26, which is an attachment of a frame composed of a sliding bar 24 and a bracket-arm 23. Bar 24 slides in holes or ways in cross-girths 63 63 of the machine-frame to an extent equal to one-half of the step movement of the carriage. The stud 26 extends below the spring-barrel or scape-wheel 25, and its lower end enters a slot 65 in a block 46, integral with feed-gage slide-rod 45, which slides with the bar 24 and is provided at each end with two check-nuts 47 and 48, which limit its movement. A vertical slotted yoke 69 fits over this rod and is integral with a long rearward extension 70 of the lower key-lever 71. The scape-wheel 25 has a peripheral flange 66, which overhangs the top edge of the carriage-rack 20, by means of which and the rack under it, when the carriage is lifted by its front edge, the pinion-frame turns on the bar 23 and the scape-wheel is drawn out of mesh with the back pallet. This disengagement of the scape-wheel from the back pallet is necessary in running back the carriage for a new line. The spring 32 is so

attached and adjusted with reference to the scape-wheel that when the carriage is backed it winds up the spring.

The action of the scape-wheel is controlled by means of two pallets, 13 a projection of arm 11 and 16 a projection of arm 15. The front pallet 16 is pivoted on center 17 and engages the teeth of the carriage-rack 20, while the back pallet is pivoted at 12 and engages the teeth of the scape-wheel. The two arms are connected by link 14, so that both act simultaneously. When the front edge of the carriage is lifted up for the purpose of sliding it back, a lip 21 on its front edge engages the finger 18, which is a fixed attachment of the front pallet-arm 15, and forces it back, thereby maintaining the normal relation of pallet 16 with the carriage-rack, and at the same time and by the same means, in connection with the link 14 and arm 11, the pallet 13 is disengaged from the scape-wheel 25, and is so held as long as the carriage is held up. One or more guide-rolls 22 are also provided, each having a flange at its top which overhangs the front edge of the carriage-platform and limits its upward and forward movements. The pallets are actuated by means of rock-shaft 6, to which is attached the spacing-key lever 7. A bail 5 extends upwardly from this rock-shaft and spans the upper arms of the whole bank of printing-keys (one of which is seen at 1 3) on the front side. Another arm 8 depends from this rock-shaft, the lower end of which is connected with the back pallet-arm by the rod 9. When a printing-key, as 1, is depressed so as to throw arm 3 to the front, it encounters bail 5 and throws it over into the dotted position, thereby, through rod 9, pushing back pallet-arm 11 and disengaging pallet 13 from the scape-wheel 25. This accomplished and all checks to the uncoiling tendency of spring 32 being removed, it exhibits its force by rotating the scape-wheel backwardly on the rack 20 to the limit of the slip of the escapement-frame in its bearings or until the jam-nuts 48 strike against the feed-gage 68, which arrests further slip. The said gage is provided with or attached to an arm or lever 70 and is rigid therewith. When the key-lever returns to its idle position, the spring 67, which bears against pallet-arm 11 with a tendency to push pallet-arm 13 into engagement with the scape-wheel, acts, and at the same moment that it throws pallet 13 into engagement with the scape-wheel 25 it withdraws pallet 16 out of engagement with rack 20, thus removing all obstacles to the spring 32 exerting itself through the scape-wheel to propel the carriage along until its further progressive movement is arrested by the jam-nuts 47 striking the frame of the machine. Thus the diameter of the scape-wheel becomes a lever in which the power is constantly applied to its axle or in its center, but the resistance and the fulcrum are, at each stroke of a printing-key, alternately transposed, so that on the down-

stroke of a printing-key the scape-wheel rolls backwardly on the rack, while on the up-stroke the scape-wheel throws the paper-carriage forward one step. In the use of this escapement-movement it will be observed that the carriage-rack and the scape-wheel frame are alternately set free to be moved by the action of one only and the same spring, whereby an extra spring to return a moving pallet to its position of initiative movement, as is generally found in movements of this character, is dispensed with, the abutment of resistance to the spring being alternately shifted from the front to the rear of the spring at each printing-key stroke.

Hence I claim as my invention the following:

1. The combination with a rack, of a scape-wheel pinion, means connected with the said pinion for rotating it, means connected with the said pinion for reciprocating it in the direction of the travel of the rack, two connected escapement-pallets, one coacting with the rack and one with the pinion, and means connected with one of the pallets for oscillating them, substantially as specified.

2. The combination with the finger 18 connected with the front pallet-arm, of the front and back pallet-arms and pallets, the sliding scape-wheel the paper-carriage provided with a lip and the rack, substantially as specified.

3. The combination of a pivotal grip-wire frame and a support allowing its oscillation, with the clamping-rolls and the springs attached to the said rolls, the said springs being arranged for contact with the said frame and to be operated thereby substantially as set forth.

4. The line-feed space-block constructed with the described step-faces and fitted to turn and slide upon a fixed stud, in combination with the platen-roll provided with a ratchet, and means, substantially as shown, interposed between the space-block and the ratchet for simultaneously depressing the

block and propelling the ratchet, substantially in the manner described and for the purposes set forth.

5. The line-feed space-block constructed with the described step-faces and fitted to turn upon a fixed stud and adapted to slide up and down thereon, in combination with the platen-roll provided with a ratchet, and means, substantially as shown, interposed between the space-block and the ratchet for simultaneously depressing the block and propelling the ratchet, the extent of sliding motion of the said block governing the turning of the said ratchet and platen-roll, substantially in the manner described and for the purpose set forth.

6. The combination in a type-writer with the mechanism for rotating the platen-roll to produce the line-spaces, of a stepped and pivoted space-block adapted to slide up and down as well as to be rotated, the extent of sliding motion of the said block governing the turning of the said ratchet and platen-roll and such sliding motion depending on the position of the said space-block as turned to bring one step or another under the lever, substantially as specified.

7. In a type-writer the combination with the paper-carriage and the platen-roll of the described rack and scape-wheel, means for rotating the scape-wheel, means for reciprocating the scape-wheel in the direction of the line of travel of the carriage, two connected pallets adapted to coact with the carriage-rack and the scape-wheel and means connected with one of the pallets for actuating it, all constructed and actuated to operate in the manner and for the purpose specified.

In witness whereof I have hereto subscribed my name this 12th day of August, A. D. 1893.

WILLIAM C. FARNUM.

In presence of—

FRANKLIN SCOTT,
WILLIAM WILCOX.