

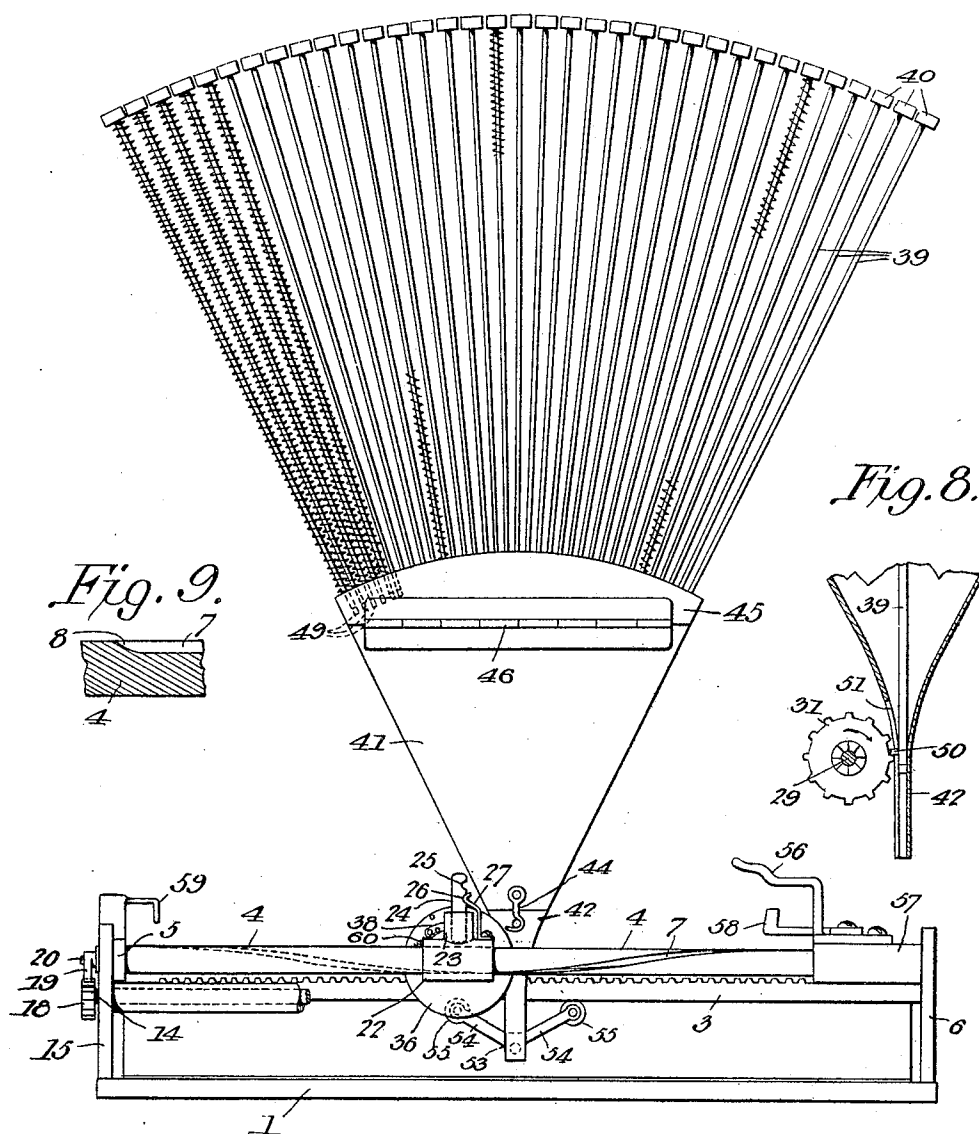
No. 799,683.

PATENTED SEPT. 19, 1905.

W. P. SMITH.
TYPE WRITING MACHINE.
APPLICATION FILED FEB. 15, 1905.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses
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3 SHEETS—SHEET 2.

Fig. 7.

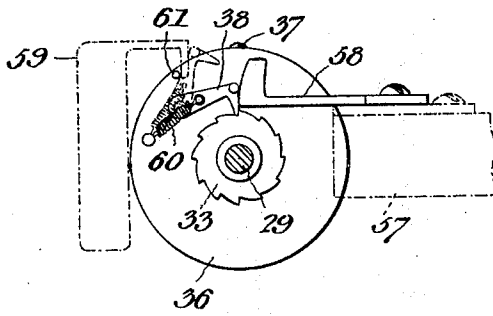


Fig. 6.

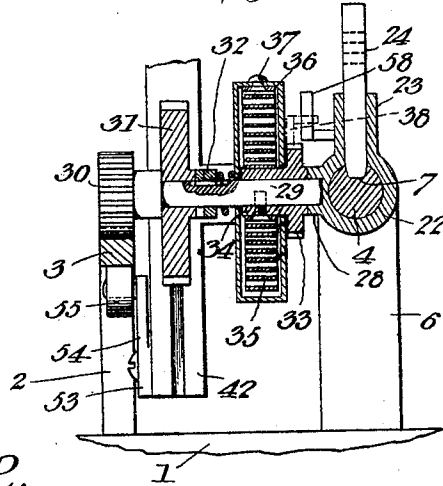
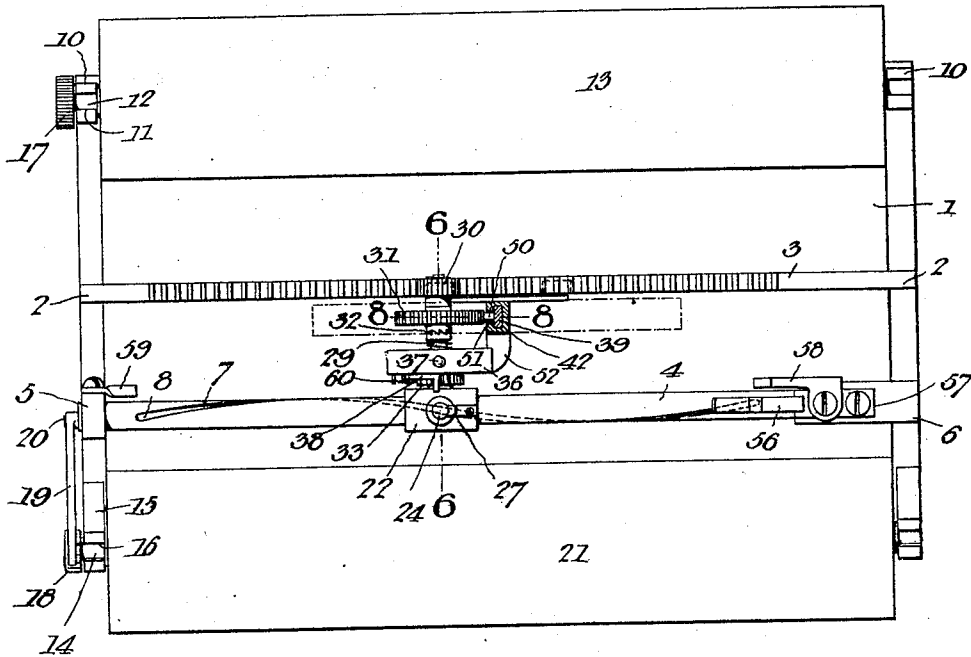


Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 5.

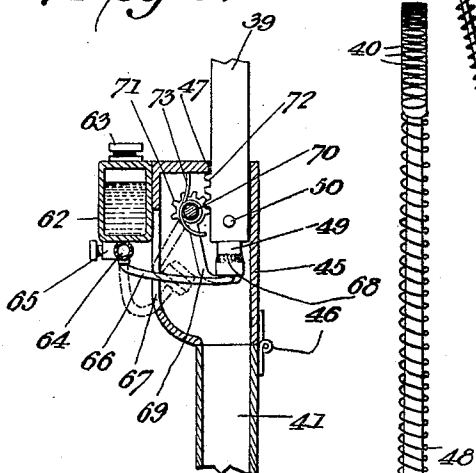
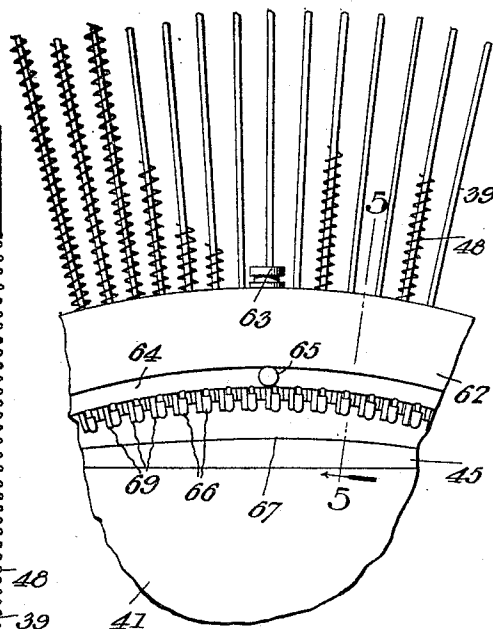
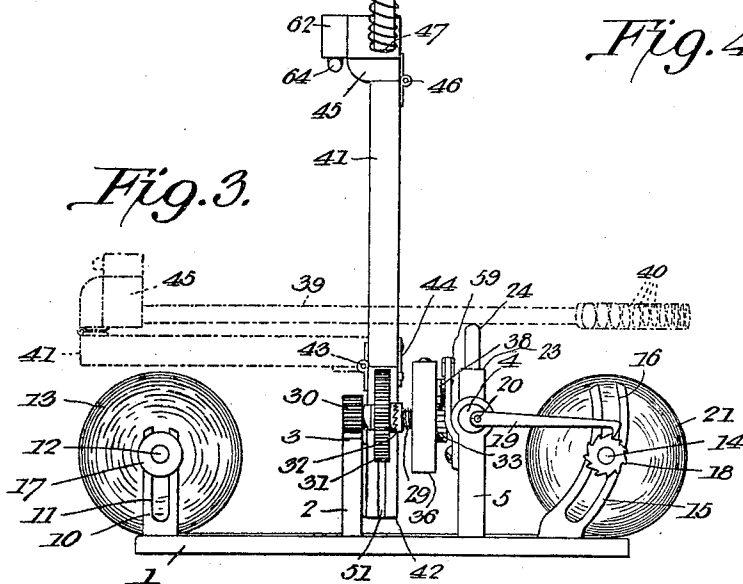


Fig. 4.

Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM P. SMITH, OF ST. LOUIS, MISSOURI.

TYPE-WRITING MACHINE.

No. 799,653.

Specification of Letters Patent.

Patented Sept. 19, 1905.

Application filed February 15, 1905. Serial No. 245,749.

To all whom it may concern:

Be it known that I, WILLIAM P. SMITH, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented a new and useful Type-Writing Machine, of which the following is a specification.

This invention relates to type-writing machines, and, among its several objects, is particularly designed to effect folding of the machine into compact form when not in use without removing the carriage or dismantling any of the parts of the machine.

It is furthermore designed to provide novel paper-feed mechanism which is automatically actuated by the return of the carriage, to effect a step-by-step advance of the carriage through the medium of the operation of the type-bars in a simple and improved manner, to provide for storing up energy in a spring for automatically returning the carriage, to provide for automatically releasing the carriage-return mechanism and to reset the same, and to effect inking of the type in a simple and approved manner without the employment of an inking-ribbon.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a front elevation of a type-writing machine embodying the features of the present invention. Fig. 2 is a plan view thereof with the keys removed and the key-casing broken off. Fig. 3 is an end view of the machine, showing the same folded in dotted lines. Fig. 4 is an enlarged fragmentary view of a portion of the key-casing to show the inking apparatus. Fig. 5 is a detail cross-sectional view on the line 5 5 of Fig. 4. Fig. 6 is an enlarged detail cross-sectional view on the line 6 6 of Fig. 2. Fig. 7 is a detail view of the means for tripping the spring-actuated carriage-return mechanism. Fig. 8 is an enlarged detail sectional view taken vertically through the lower end of the key-bar casing on the line 8 8 of Fig. 2. Fig. 9 is a detail sectional view taken longitudinally through one end of the spiral groove in the rotatable paper-feeding bar.

Like characters of reference designate corresponding parts in each and every figure of the drawings.

For the support of the several parts of the present machine there is a frame including a base or bed plate 1 to rest upon a table or other support, with the upper face of the bed-plate constituting a flat horizontal platen over which the paper is fed and against which the type strike. At opposite ends of the bed-plate are corresponding posts 2, which support a rack-bar 3, that is toothed upon its upper side. At about the same height and in substantial parallelism with the rack-bar there is a cylindrical rotatable bar or shaft 4, having its ends journaled in the posts 5 and 6, rising from opposite ends of the bed-plate. This shaft is provided with a spiral groove or guideway 7, the left-hand end of which, as best indicated in Figs. 2 and 9 of the drawings, terminates short of the adjacent end of the shaft in an outwardly-inclined end wall 8 for a purpose as will be hereinafter described.

At the back of the bed-plate are posts 10, rising from opposite ends of the plate, each post being provided with a longitudinal slot or bifurcation 11 for the loose reception of one end of a roll-holder in the nature of a spindle 12, upon which is a paper-roll 13, from which the paper extends forwardly across the flat top of the bed-plate 1 to a receiving roll-holder 14, having its ends loosely mounted in posts 15, rising from the bed-plate, each of said posts being provided with an arcuate slot or bifurcation 16, struck from a point between the front and rear posts. One end of the roll-holder 12 is provided with a suitable knob or hand-wheel 17 for convenience in manually rotating the roll-holder, and the adjacent end of the other roll-holder 14 is provided with a ratchet-disk 18, through the medium of which a step-by-step rotary movement is imparted to the roll-holder 14 by a ratchet-dog 19, terminally pivoted, as at 20, eccentrically upon the adjacent end of the rotatable paper-feeding shaft or bar 4. It will here be explained that the two rolls of paper rest upon the bed-plate in order that that portion of the paper between the two rolls may lie flat against the plate, whereby the roll-holder 12 gravitates in the slotted posts 10 under the reduction of the paper-roll 13, while the roll-holder 14 works upwardly under the influence of the increase in diameter of the other paper-roll 21. It will now be understood that the slot 16 of the post 15 is struck

from the longitudinal axis of the shaft 4 as a center in order that the dog 19 may remain in engagement with the ratchet-disk 18 in every elevated position thereof.

5 Upon the paper-feeding shaft 4 there is a slide 22, preferably in the nature of an open-ended tube having an open-ended guideway or socket 23 rising from the top of the slide and within which works an upright pin 24,
10 designed to have its lower end fit within the spiral guideway 7, and thereby rotate the shaft 4 when the slide 22 is moved to the left by the mechanism which will be hereinafter explained. This pin projects above the top
15 of the socket 23 and in its upper projected portion is provided with upper and lower notches or seats 25 and 26, with which the upper free end of a spring 27 is designed to alternately engage, said spring being carried
20 by and rising from the slide. When the spring is in the lower notch 26, the pin will be held up out of the spiral guideway 7, and therefore have no influence to rotate the shaft 4 when the slide is moved thereon. When
25 the spring is engaged with the upper notch 25, the pin is held down in engagement with the spiral guideway, so as to rotate the shaft 4 when the slide is slid thereon. As best shown in Fig. 6 of the drawings, a bearing
30 28 is provided upon one side of the slide between the rack-bar 3 and the shaft 4, and a spindle 29 has one end rotatably mounted in this bearing and its opposite end provided with a pinion 30, traveling upon the station-
35 ary rack 3, whereby the spindle is supported in a substantially horizontal position transversely between the shaft 4 and the rack 3. Upon this spindle 29 there is a drive-gear 31, which is connected to the spindle by a clutch
40 32, so as to be locked with the spindle and rotate the same in the direction of the arrow shown on Fig. 8 and to permit loose rotation of the gear upon the spindle in the opposite direction for a purpose as will hereinafter appear. The gear 31 is located adjacent
45 the pinion 30, and a ratchet-disk 33 is mounted upon the spindle adjacent the other end thereof and is provided with an extended hub 34, fixed to the spindle in any suitable manner. This hub 34 extends between the ratchet-
50 disk 33 and the gear 31, with a coiled spring 35 embracing the hub and having its inner end connected thereto. A cylindrical case 36 incloses the spring and has the outer end of the latter connected to the case, as at 37.
55 Upon the exterior of the case is a spring-dog 38, best shown in Figs. 1 and 7 of the drawings, and in mesh with the ratchet-disk 33, whereby rotation of the spindle 29 when driven
60 in the direction of the arrow on Fig. 8 by the gear 31 operates to store up power in the spring for use in automatically returning the carriage, as will be hereinafter explained.

The type-bars 39 are arranged vertically to
65 move endwise, their upper ends being pro-

vided with the usual keys 40 and their lower ends working in a case or carriage 41, which is converged downwardly, the type-bars being arranged to radiate vertically from the bottom
of the case. This case is provided with a 70 separate funnel-shaped bottom section 42, lying between the rack 3 and the shaft 4, with its lower open end in close proximity to the bed-plate, the main upper part of the case being connected to the bottom section by a 75 hinge 43, there being a suitable fastening device in the nature of a latch 44 disposed upon the opposite side of the case to render the hinge-joint rigid during the operation of the machine. At the top of the case 41 there
80 is a segmental top section 45, hinged to the body-section, as at 46, opposite the hinge-joint 43, whereby these parts may be folded downwardly, as indicated in dotted lines in Fig. 3 of the drawings, thereby to fold the machine
85 in compact form when not in use. Each type-bar 39 is in the nature of a flat metallic spring-bar, which works through a guide-opening 47 in the top of the case-section 45, as best indicated in Fig. 5 of the drawings. 90 A spring 48 embraces each type-bar and bears against the top of the case and the under side of the adjacent key 40, whereby the type-bar is yieldably held in its elevated position with the type 49 upon its lower end normally lo-
95 cated within the top section 45. As hereinbefore indicated, the type-bars radiate from the funnel-shaped bottom section of the casing, and when any type-bar is depressed by pressing downwardly upon its key 40 the 100 type and the lower end of the type-bar will pass down into the funnel 42, and by reason of the flexibility of the type-bar it will bend so as to pass vertically downward through the funnel-shaped bottom section, so as to
105 strike the type squarely upon the paper beneath the funnel. When pressure is relieved from the key, the spring 48 will automatically elevate the type-bar to its original position. During the downward movement of
110 each type-bar a projection 50 upon one side of the lower portion of the bar engages the gear 31 through a slot 51 in the lower portion of the guide-funnel, thereby turning the spindle 29 by the downward movement of each and every
115 type-bar, which operates to store up energy in the spring 35. When the type-bar springs upwardly, the projection 50 of course rotates the gear in the opposite direction, from which it will be understood that the clutch 32 inter-
120 locks the gear 31 with the spindle 29 to rotate the latter during downward movements only of the type-bars and permits of the gear rotating loosely in a backward direction during upward movements of the type-bars. In
125 addition to storing up energy in the spring the rotation of the spindle 29, which is of course only slight, causes the pinion 30 to rotate, and thereby travel one tooth along the rack 3, thereby to move the carriage one step

from the left to the right as the result of the operation of each type-bar.

For the support of the type-bar case the funnel-section 42 is connected to the spring-case 36 by a bracket 52, and to prevent rotation of the casing upon the spindle 29 under the influence of the type-bar case a bracket 53 is secured to the funnel-section 42 and provided with upwardly directed and diverged arms 54, which are offset laterally, so as to lie beneath the track or rack-bar 3, and are provided at their upper ends with antifriction-rollers 55, traveling against the under side of the track, so as to prevent tilting of the type-bar case and the spring-case upon the spindle 29.

It will now be understood that the spindle 29 travels upon the track 3 and the shaft 4 through the medium of the pinion 30 and the slide 22, thereby to constitute a carriage for the support of the type-bar case and the feed mechanism whereby the carriage is moved with a step-by-step movement from the left to the right of the machine as the writing operation progresses. During the movement of the carriage from the left to the right the pin 24 is supported in an elevated position by the spring 27 in order that the slide 22 may move upon the shaft 4 without rotating the same. When the carriage reaches its right-hand limit, the upper end of the pin 24 engages beneath an elevated trip 56, carried by the stationary bearing 57 for the right-hand end of the shaft 4, said bearing being in turn carried by the adjacent post 6. This trip 56 overhangs the shaft 4 and depresses the pin 24 into the spiral guideway 7. As soon as the pin 24 becomes seated in the guideway 7 the dog 38 upon the spring-case 36 comes into contact with a stationary trip 58, carried by the bearing 57 and offset at the inner side of the shaft 4, whereby the dog 38 will be lifted from the ratchet-disk 33 and the coiled spring 35 thereby released to rotate the spindle 29 in a backward direction, and through the medium of the pinion 30 traveling upon the track 3 the carriage will be automatically returned to the left-hand side of the machine in a very simple and efficient manner. During the return movement of the carriage the pin 24 upon the slide 22 works in the spiral groove 7 of the shaft 4, thereby rotating the shaft, which in turn operates the dog 19 (shown in Fig. 3 of the drawings) to turn the roll-holder 14, and thereby feed the paper one space preparatory to writing another line. Upon reaching the left-hand limit of its movement the dog 38 upon the spring-case 36 strikes a trip 59, carried by the adjacent post 5, whereby the dog is returned into engagement with the ratchet-disk 33 preparatory to storing up energy in the coiled spring 35. The tripping of the dog 38 at opposite limits of the carriage has been indicated in Fig. 7 of the drawings, the full-line position indicating the right-hand limit

and the dotted trip 59 indicating the relation of the parts at the left-hand limit. It will here be noted that the dog 38 is yieldably held in engagement with the ratchet-disk 33 by means of a helical spring 60, connected at opposite ends to the dog and the spring-case 36 in such a manner that the connection of the spring with the dog lies at one side of the pivotal support of the latter when the dog is in engagement with the ratchet-disk 33 and is shifted to the opposite side of the pivotal support when the dog is lifted by the trip 58, so as to hold the dog elevated, as in dotted lines, against the stop 61 upon the spring-case 36 until the dog is depressed by coming into contact with the trip 59. With respect to the rotation of the shaft 4 by the pin 24 it will here be explained that as the carriage approaches its left-hand limit the bottom of the pin 24 wipes across the upwardly-inclined or cam end 8 of the guideway 7 (best shown in Fig. 9 of the drawings) and is thereby automatically elevated out of the guideway, the spring 27 of course snapping into the notch or seat 26, so as to maintain the pin out of the spiral guideway during the feeding of the carriage from the left to the right of the machine.

As hereinbefore indicated, it is proposed to dispense with the usual inking-ribbon, and in lieu thereof there is an ink-reservoir 62, which is arcuate in shape and carried by one side of the laterally-enlarged top section 45 of the type-bar case. This reservoir has a filling-opening in the top thereof, which is provided with a suitable closure 63, and across the bottom of the reservoir is a supply pipe or passage 64, at the middle of which there is a suitable valve 65 for controlling the supply of ink from the reservoir to this pipe or passage. A flexible service-pipe 66 leads from the supply-pipe 64 inwardly through an opening 67 in the top section 45 to an ink-pad 68, which normally lies against the face of the adjacent type 49 and is carried by the lower end of an arm 69. The upper end of this arm is mounted to swing back and forth upon a shaft 70, said arm being loosely rotatable upon the shaft and provided with a toothed segment 71, embracing the shaft and in mesh with teeth 72 upon the adjacent edge of the lower end portion of one of the type-bars. When the type-bar is in its normal elevated position, as shown in Fig. 5, the ink-pad 68 is held against the face of the type by reason of the toothed segment 71 being engaged with the teeth 72 of the type-bar. When the type-bar is depressed, the segment 71 is rotated to swing the arm and ink-pad into the dotted-line position, there being a spring 73 connected to the top section of the casing and the arm 69 in such a manner as to hold the arm and the ink-pad out of the path of the type-bar to prevent interference therewith. When the type-bar is again elevated to its normal position, the teeth 72 thereof will mesh with the gear 71, and there-

by automatically return the ink-pad to its normal position in engagement with the face of the type against the influence of the spring 73. It will of course be understood that there is one such inking mechanism for each and every type-bar, and the flexible pipe 66 is employed to permit of the necessary swinging movements of the ink-pad. By means of this inking mechanism the type are always maintained in a properly-inked condition and are not so frequently choked by accumulations thereon as when an inking-ribbon is employed. Moreover, the ink-reservoir may be readily charged through the filling-opening thereof without removing the reservoir and without dismantling any of the parts of the machine.

Having thus described the invention, what is claimed is—

1. In a type-writing machine, the combination with a platen, of a carriage, a type-bar guide carried by the carriage, and type-bars working upon the guide, the guide being foldable toward the platen in the normal condition of the type-bars.

2. In a type-writing machine, the combination with a platen, of a carriage, a type-bar guide hinged upon the carriage to fold in one direction toward the platen and provided with an outer section hinged to fold in the opposite direction, and type-bars working upon the guide-sections and normally carried by the outer section only to permit folding of the guide-sections.

3. In a type-writing machine, the combination with a substantially horizontal platen, of a carriage, a type-bar guide rising from and hinged to the carriage to fold toward the platen and provided with an upper section hinged to fold in the opposite direction, and type-bars working upon the two sections and rising thereabove, said type-bars being normally elevated and carried by the top section only to permit folding of the type-bar guide.

4. A type-writing machine having a type-bar guide, and type-bars working upon the guide, the guide being foldable in the normal condition of the type-bars.

5. A type-writing machine having a type-bar guide made up of foldable sections, and type-bars normally carried by the outer section only, the type-bar guide being foldable in the normal condition of the type-bars.

6. A type-writing machine having a type-bar guide formed of hinged sections and provided with a funnel-shaped exit, and endwise-movable type-bars working in the guide and through the exit thereof, the type-bars being flexible to bend when passing through the exit and carried by the outer section of the guide, the sections of the guide capable of being folded in the normal condition of the type-bars.

7. In a type-writing machine, the combination with a platen, of a type-bar guide having a funnel-shaped exit leading toward the platen,

and a series of normally straight endwise-movable type-bars working in the guide and through the exit thereof, each type-bar being flexible to bend on entering the exit and to work therethrough into coöperation with the platen.

8. In a type-writing machine, the combination of a type-bar, an ink-reservoir, a movable ink-pad in communication with the reservoir and normally in contact with the face of the type, and meshed racks associated with the ink-pad and the type-bar to move the pad out of the path of the bar and to return the pad to the type.

9. In a type-writing machine, the combination of a type-bar, an ink-reservoir, a pivotal arm provided with a segmental rack disposed concentrically with the pivot of the arm, an ink-pad carried by the arm, a flexible supply-tube leading from the ink-reservoir to the pad, and teeth upon the type-bar in mesh with the segment to actuate the arm for swinging the pad out of the path of the type-bar and back into engagement with the type.

10. In a type-writing machine, the combination of a type-bar, an ink-reservoir, a movable ink-pad in communication with the reservoir and normally in contact with the face of the type, a gear associated with the ink-pad, teeth upon the type-bar in mesh with the gear to rotate the latter during the initial movement of the type-bar for moving the pad out of the path of the type-bar and also capable of engaging the gear in the final stage of the return movement of the type-bar to return the inking-pad to the type, and means to maintain the inking-pad out of the path of the type-bar when the teeth of the type-bar are out of engagement with the gear.

11. In a type-writing machine, the combination of a reciprocatory type-bar, an ink-reservoir, a pivotal arm provided with a gear disposed concentrically with the pivotal support of the arm, an ink-pad carried by the free end of the arm and in communication with the ink-reservoir, teeth upon the type-bar and normally in mesh with the gear to maintain the inking-pad in engagement with the type and capable of turning the gear and swinging the pad out of the path of the type-bar during the initial movement of the latter, and a spring to maintain the pad out of the path of the type-bar when the teeth of the latter are out of engagement with the gear, said teeth capable of reengaging the gear in the final stage of the return movement of the type-bar to return the inking-pad to the type.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM P. SMITH.

Witnesses:

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C. E. DOYLE.