

(No Model.)

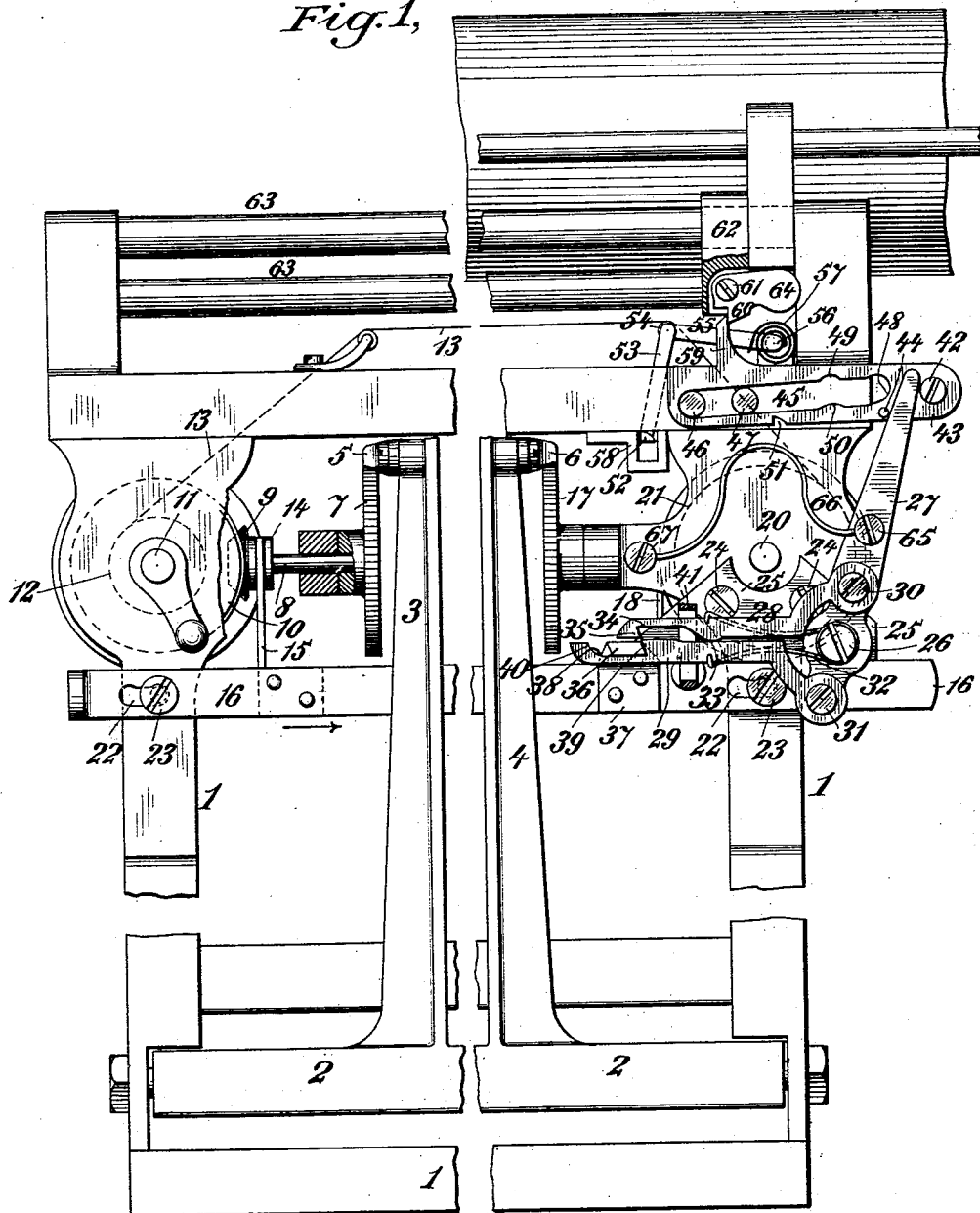
3 Sheets—Sheet 1.

C. H. SHEPARD.
TYPE WRITING MACHINE.

No. 573,626.

Patented Dec. 22, 1896.

Fig. 1,



WITNESSES:

C. H. Shepard
Ida Macdonald

INVENTOR

Charles H. Shepard
BY
James F. Felt
ATTORNEY

(No Model.)

3 Sheets—Sheet 2.

C. H. SHEPARD.
TYPE WRITING MACHINE.

No. 573,626.

Patented Dec. 22, 1896.

Fig. 2.

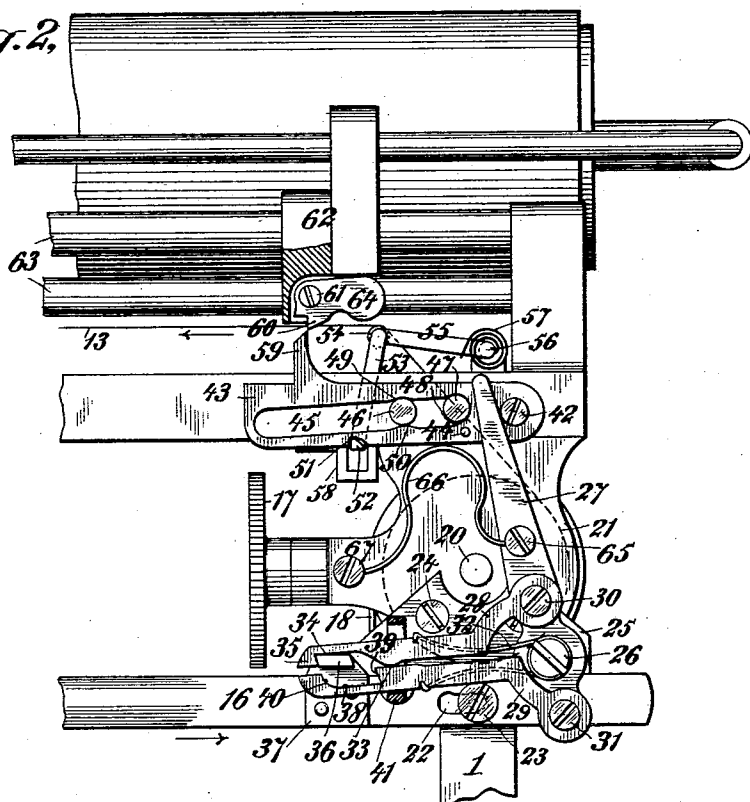
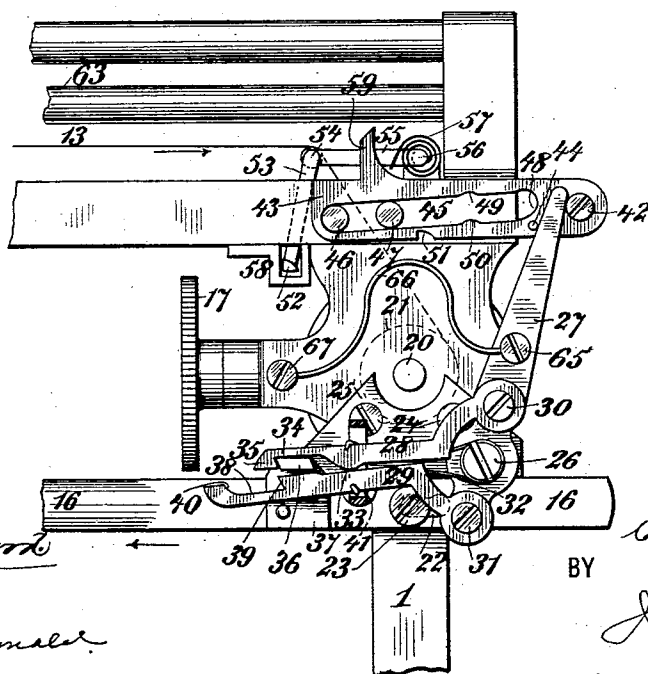


Fig. 3.



WITNESSES:

B. H. Raymond

da Macanudo

INVENTOR

Charles H. Shepard

BY

Jacob Felbel
ATTORNEY

(No Model.)

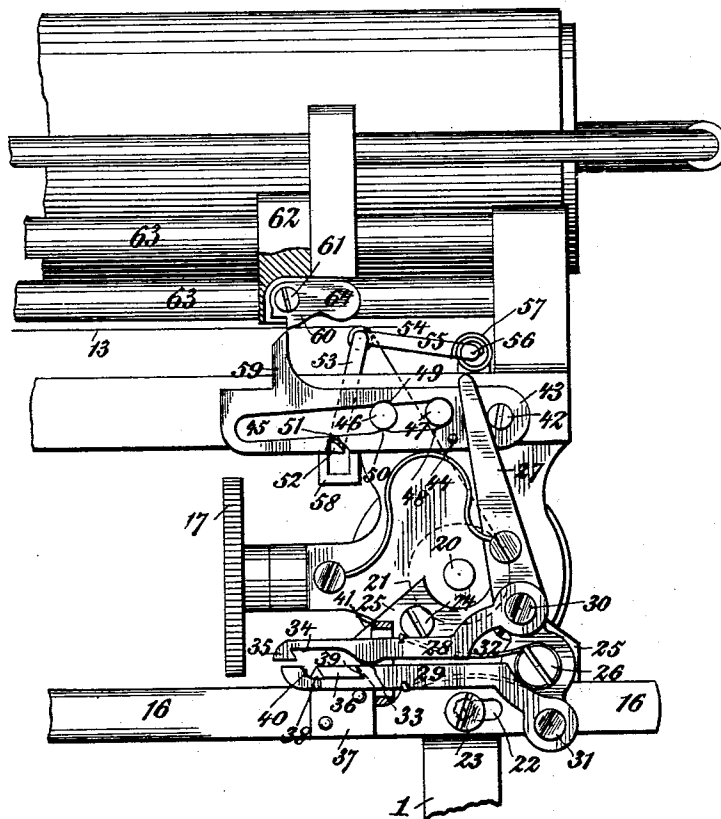
3 Sheets—Sheet 3.

C. H. SHEPARD.
TYPE WRITING MACHINE.

No. 573,626.

Patented Dec. 22, 1896.

Fig. 4.



WITNESSES:

D. A. Raymond
W. J. Hoffman

INVENTOR

Charles H. Shepard
BY
James F. Felt
ATTORNEY

UNITED STATES PATENT OFFICE.

CHARLES H. SHEPARD, OF ILION, NEW YORK, ASSIGNOR TO THE WYCKOFF, SEAMANS & BENEDICT, OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 573,626, dated December 22, 1896.

Application filed June 1, 1894. Serial No. 513,137. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. SHEPARD, a citizen of the United States, and a resident of Ilion, in the county of Herkimer and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My improvements in type-writing machines relate particularly to means for automatically reversing the longitudinal direction of movement of the inking-ribbon, and has for its main object the provision of simple, durable, and effective mechanism therefor.

To this end my invention consists in certain features of construction and combinations of devices, as will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a back view of part of a type-writing machine embodying my invention, some portions of the view being in section and the central portion of the machine being cut away to condense the view. Fig. 2 is a similar view of one side of the machine with the reversing mechanism in a different position. Fig. 3 is a view similar to that last mentioned with the reversing mechanism in still another position, and Fig. 4 is a similar view with the reversing mechanism in yet a different position.

In the several views the same part will be found designated by the same numeral of reference.

For convenience I have shown my invention carried out in that form of machine known as the "Caligraph No. 3;" but it will of course be understood that my improvements may be applied to other types or constructions of machine.

In carrying out my invention the ribbon, as usual, is connected to ribbon-spools and is automatically wound step by step from one spool onto the other. When the paying-off spool becomes empty, a shifting bar or switch which controls the means for rotating said spools is automatically moved to throw into gear the devices for winding the ribbon upon said empty spool and to throw out of gear the devices for winding the ribbon upon the

opposite spool. The shifter-bar or switch is first moved in one direction and then in the opposite direction by alternately operating pushing and pulling arms attached to a spring-actuated lever which is connected to a sliding plate or frame that at the proper time is moved by the paper-carriage on its returning stroke and automatically locked by a spring-actuated catch. During this movement of said plate the said lever connected thereto is vibrated to bring either one of said arms into operative relation to the shifter-bar or switch to actuate the same when the sliding plate is released and the power of the spring connected to the lever is left free to act, said spring serving to return the plate and the lever to their first positions against a stop and at the same time to move the switch and change the spool-operating gearing. The sliding plate controlling the lever is automatically released by means of the pressure of the ribbon on a cross-bar of the latch mechanism, which occurs when the ribbon is unwound from either spool and begins to draw tight, all as will now be more fully explained.

1 designates the framework of the machine, at near the base of which is arranged a rocking frame 2, which, as in the Caligraph, forms a part of the universal bar and spacing-frame. Rising from this frame are two arms 3 and 4, bearing, respectively, at their upper ends driving-pawls 5 and 6, the former engaging with a ratchet-wheel 7 on a short shaft 8, mounted in suitable bearings, and provided at its opposite end with a beveled gear 9, that is adapted to be engaged with and disengaged from a beveled gear 10 on a spool-shaft 11, mounted in suitable bearings in the framework and at right angles to the shaft 8. Upon said shaft 11 is mounted to turn therewith a ribbon-spool 12, to which one end of the inking-ribbon 13 is connected. The beveled pinion 9 is provided with a collar 14, with which engages a forked arm 15, secured by rivets or otherwise to the horizontally-arranged shifter-bar or switch 16.

The driving-pawl 6 engages with a ratchet-wheel 17, mounted on a shaft precisely similar to 8, which at its opposite end has a bevel-pinion and collar precisely similar to those marked 9 and 14, but which are hidden in the

view by the framework and by reason of the fact that the parts at this side of the machine are shown in elevation instead of in section. A forked arm 18, riveted to the shifter-bar 16, is provided to engage the hidden collar of the spool-driving pinion on the shaft bearing the ratchet-wheel 17. This pinion engages a bevel-gear on the ribbon-spool shaft 20 in precisely the same manner that the bevel-gear 10 is engaged by the bevel-pinion 9 at the other side of the machine. Upon the spool-shaft 20 is mounted to turn therewith a ribbon-spool 21, to which is connected the other end of the inking-ribbon 13. The shifter-bar or switch 16 is slotted near each end, as at 22, and is supported on the framework of the machine by screws 23. The shifter-bar is thus capable of being moved longitudinally and through the arms 15 and 18 to simultaneously slide the spool-rotating pinions on their shafts. At Fig. 1 the pinion 9 is in mesh with the gear 10, while the pinion at the opposite side of the machine is out of engagement with its gear. When the shifter-bar is moved in the direction of the arrow at Fig. 1, the last-mentioned gears are put into engagement and the gears 9 and 10 are separated to change the direction of movement of the ribbon; but this shifting does not take place until the ribbon-spool 12 is filled, and then the action is accomplished automatically and by the means which will now be described.

Attached to the framework by screws 24 is a supporting or base plate 25, to which is pivoted at 26 a lever 27, which carries two arms 28 and 29, the former being pivoted at 30 and the latter at 31, said pivots being on opposite sides of the pivot of the lever and equidistant therefrom. The said arms are arranged substantially horizontally and parallel with the shifter-bar which they actuate. The arms 28 and 29 are kept pressed against each other by a wire spring 32, which is coiled around the pivot of the lever at its center and has one branch or member connected to the upper arm and the other branch or member connected to the lower arm. The upper arm 28 is provided with a swell or cam 33 on its under side, which at all times bears against the upper edge of the lower arm, and said upper arm is also formed with a cut-away or notch 34 and with a hook 35, the said notch adapting the hook to catch upon the inner end of a lug or offset 36 upon a plate 37, riveted or otherwise secured to the shifter-bar. The lower arm 29 is cut away at 38 to form a shoulder 39, adapted to bear against the outer end of said offset 36, and with a curved or cam-like end 40, adapted to act at the inner end of the offset and slightly depress said arm, as will be hereinafter more fully explained. The upper and lower arms pass through a guide or loop 41, connected to the shifter-bar, and of a size sufficient to allow the pawls to move up and down alternately. The upper arm of the lever 27 is considerably the longer and extends up to a

stud 42 on a sliding plate or frame 43, which is provided with a pin 44 on the opposite side of said lever, and which is also formed with an inclined slot 45, running longitudinally of the plate, through which extend two round pins 46 and 47, projecting rearwardly from the main frame. The ends of the slot 45 are rounded, the one to fit about the pin 46 and the other to fit about the pin 47, said pins forming bearings or guides for the plate and also stops to limit its sliding movements, the pin 46 limiting the movement of the plate toward the right (considered from the back of the machine) and the pin 47 limiting the movement of the plate toward the left. The right-hand end of the slot (viewed from the rear of the machine) is curved upward slightly, as at 48, and the metal at the upper edge of said slot is formed with a notch 49, in line with a cam or protuberance 50 in the metal at the lower edge of the slot.

On the under side of the sliding plate is formed a notch 51, adapted to receive a catch 52 on the lower end of a pendent arm 53, pivoted at 54 to an inwardly-projecting arm 55, pivoted at 56 on the framework, and provided with a coiled spring 57, tending normally to hold the catch in its uppermost position. The catch works in a guideway 58 on the under side of the framework, which acts as a stop to the upward movement of said catch and its arm when out of engagement with the sliding plate. Projecting upwardly from the sliding plate is a spur 59, adapted to be engaged at certain times by a lug 60, pivoted at 61 to a part of the paper-carriage 62, which slides upon guide-rods 63. Said lug is provided with a weighted end 64 to insure its maintenance in a pendent position and in proper condition to engage said spur.

To the lever 27 at 65 is connected one end of a curved spring 66, whose opposite end is attached at 67 to the framework, said spring being constructed and arranged to move the upper arm of the lever and the sliding plate toward the right, as will more clearly appear from the following description of the mode of operation of the mechanism.

Referring to Fig. 1, the parts are shown in the positions which they occupy when the spool 21 has been filled and the reversing-mechanism switch has just thrown into engagement the gears 9 and 10 to cause the ribbon to wind upon the spool 11. Immediately before this reversing action took place the plate 43 and the lever 27 and other parts occupied the positions shown at Fig. 4, (except that the spool 21 was full,) and said plate and said lever were released by the pull or pressure of the inking-ribbon upon the arm 55, which was sufficient to depress the catch 52 and remove it from the notch 51, whereupon the spring 66 operated to throw said plate and said lever toward the right (looking from the back of the machine) and into the position shown in Fig. 1. During these movements of the plate and lever the shoulder 39 of the

arm 29, being in contact with and acting on the lug 36, operated to move the shifter-bar toward the left, (looking from the back,) and at the same time the arms 53 and 55 were caused to ascend under the influence of the spring 57, the tension or pull of the ribbon being relieved as soon as the shift takes place. Tension is put in the ribbon when it has entirely unwound from either spool, and under the driving power the ribbon is tugging at its fastening device on the unwound spool. When the plate 43 slides toward the right, it is also caused to rise slightly, owing to the inclined slot therein and the pins 46 and 47. In rising the point of the spur 59 is thus brought into the plane or path of travel of the lug 60 on the paper-carriage and into the proper position to be acted upon by said lug. When this shift occurred, it took place without reference to the position of the paper-carriage or the lug 60 thereon; that is to say, the lug 60 may have been at the opposite end of the machine when the shift occurred, as the shifting operation is wholly independent of the position of the lug 60 or the position of the paper-carriage. If the lug 60 should be on the opposite or left-hand side of the spur when the shift takes place, said lug on meeting said spur will ride over the same (both devices being beveled) and will, owing to the weighted end of the lug, automatically drop behind the spur, as shown at Fig. 1, and into a position to reset the shifting mechanism. Now on a return movement of the paper-carriage (effected by the arm of the operator for the beginning of a new line) the lug 60 will act to slide the plate in the direction of movement of the carriage to vibrate the lever 27 and put the spring 66 under tension, and at the same time, by reason of the inclined slot in the plate, the latter will be gradually slightly depressed until the notch 51 aligns with and is engaged by the catch, at which time the point of the spur has been carried down to a plane low enough to escape from the lug 60 on the paper-carriage. This escape of the spur and the lug is insured by the coöperation of the cam 50 on the plate and the fixed pin 46.

After the spur and the lug have parted company and the plate and the lever have been relatched or reset the carriage will move back and forth upon its ways without affecting the reversing mechanism until the spool 11 shall have been filled and the plate and the lever have again been unlatched by the pressure of the inking-ribbon. Thus it will be seen that the paper-carriage is entirely free from the reversing mechanism at all times, excepting immediately after a reversal has been made, and then it coöperates with the said mechanism only during one return movement of the paper-carriage and for the purpose of resetting the reversing mechanism.

Referring to Fig. 2, wherein the reversing mechanism is shown as reset and the ribbon about to feed from the spool 21, it will be ob-

served that the hook 35 on the arm 28 rests in engagement with the inner end of the lug 36 and in readiness to move the switch or shifter-bar in the direction of the arrow when the catch-plate is released and the lever 27 is vibrated by its spring, which movements of course take place when the spool 21 has discharged the ribbon thereupon and the direction of travel of the ribbon needs reversing.

Referring to Fig. 3, the ribbon-spool 21 is shown as empty and the switch as having been shifted through the releasement of the catch-plate and lever. On the next return trip of the carriage the reversing mechanism will be again reset by the engagement of the lug 60 and the spur. During this relatching the shoulder 39 on the arm 29 takes a bearing against the outer end of the lug 36, so that when the lever 27 is next released the shifter-bar will be moved in the direction of the arrow at Fig. 3, which will bring the parts back into the positions shown at Fig. 1.

Referring to Fig. 4, the reversing mechanism is shown as reset and the ribbon is about to feed or wind upon the spool 21. When this spool becomes full, the plate 43 will be automatically unlatched by the pressure of the ribbon, and the spring will throw the lever 27 outwardly and cause the arm 29 to move the switch, so as to disengage the driving-gears of the spool 21 and reengage the driving-gears of the spool 12, as shown at Fig. 1.

Fig. 1 shows the position of the parts just after the switching has occurred to cause the ribbon to wind on the spool 12 and before the spring mechanism has been reset.

Fig. 2 relates to Fig. 1 and shows the parts just after the resetting of the switching mechanism.

Fig. 3 shows the parts just after the shift has been made to wind the ribbon back onto the spool 21, but before the resetting of the spring mechanism.

Fig. 4 relates to Fig. 3 and shows the parts immediately after resetting. When the spool 21 has filled, then the parts shift to the position shown at Fig. 1.

In moving the lever 27 from the position shown at Fig. 1 to that shown at Fig. 2 the cam-face 40 on the arm 29, contacting with the inner end of the lug 36, operates to vibrate the arm 29 downwardly to insure the hook 35 catching upon said lug, and when said lug has been thus caught the cam or swell 33 of the arm 28 bears upon the top edge of the arm 29, as shown at Fig. 2, and maintains the latter in its depressed position.

In relatching the reversing mechanism, when in the position shown at Fig. 3, the cam or swell 33 on the inward movement of the arm 28 contacts with the outer end of the lug 36 and operates to lift said arm and throw the hook 35 thereon above the plane of said lug and thus enable the arm 29 to rise simultaneously with its movement in an outward direction, so that the shoulder 39 may take a

position against the outer end of said lug 36, in order that the shifter-bar may be moved to the position shown at Fig. 1 upon the next release of the reversing mechanism.

5 From the foregoing it will thus be seen that, with a mechanism arranged at one end of the machine only, the longitudinal travel of the ribbon may be automatically reversed when either of the two spools becomes empty, and
10 that such change in the direction in the travel of the ribbon is effected by a spring-actuated mechanism, which is automatically set by a movement of the paper-carriage and which is released for action by the pull or pressure
15 of the inking-ribbon itself when it becomes necessary for the ribbon to change its direction of travel.

Various forms or constructions of shifter-bar or switch and spool-rotating means may be
20 employed without departing from the spirit of my invention, and many changes in detail construction may be made in the reversing mechanism herein shown within the limits of my improvements, while at the same time it
25 will be understood that the invention may be carried out in other forms or constructions of type-writing machines and which would necessarily involve more or less change in construction and arrangement of the devices
30 composing the reversing mechanism and the resetting devices.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a type-writing machine, the combination of an inking-ribbon, means for moving
35 it longitudinally in two directions, a switch, a spring-actuated switch-moving mechanism, a latching mechanism connected to the latter, a paper-carriage, and a device thereon for
40 actuating said latching mechanism and causing it to set the spring-actuated switch-moving mechanism.

2. In a type-writing machine, the combination of an inking-ribbon, means for moving
45 the same longitudinally in two directions, a switch, a spring-actuated switch-moving mechanism, a sliding plate connected thereto, a paper-carriage for moving said plate in one direction, and a catch for holding said plate
50 when moved in this direction.

3. In a type-writing machine, the combination of an inking-ribbon, means for moving
the same longitudinally in two directions, a switch, a spring-actuated switch-moving
55 mechanism, a sliding plate connected thereto and having simultaneously both an endwise and a widthwise movement, a paper-carriage, and a catch for locking said plate and the switch-moving mechanism.

4. In a type-writing machine, the combination of an inking-ribbon, means for moving
60 the same longitudinally in two directions, a switch, a spring-actuated switch-moving mechanism, a sliding plate connected thereto and provided with a spur, a paper-carriage
65 provided with a lug to engage said spur and move said plate endwise, means for simulta-

neously causing said spur and lug to gradually part company, and a catch adapted to engage said plate when the disengagement
70 of the spur and the lug has been effected.

5. In a type-writing machine, the combination of an inking-ribbon, means for moving
it longitudinally in two directions, a switch, a switch-moving mechanism, a sliding plate
75 provided with an inclined slot and a spur, a fixed pin or pins occupying said slot, a paper-carriage, a pivoted lug thereon, and a catch for said plate.

6. In a type-writing machine, the combination of an inking-ribbon, means for moving
80 it longitudinally in two directions, a switch, a switch-moving mechanism, a sliding plate connected thereto and provided with an inclined slot, a notch, a cam and a spur, a paper-
85 carriage provided with a pivoted and weighted lug, a pin or pins occupying said slot, and a spring-actuated catch contrivance consisting of the catch proper, the two pivoted arms, over one of which the ribbon passes, and the spring.
90

7. In a type-writing machine, the combination of an inking-ribbon, a pair of ribbon-
spools, means for alternately rotating said spools, a switch connected thereto, a spring-
95 actuated switch-moving mechanism, a latching device connected to the latter, a paper-carriage adapted to actuate said latching device, and a catch contrivance adapted to lock the said latching device; the inking-ribbon being
100 arranged to pass over said catch contrivance and to bear down upon the same when the ribbon needs reversing and to thereby cause the said catch contrivance to release the latching device and the spring-actuated
105 switch-moving mechanism.

8. In a type-writing machine, the combination of an inking-ribbon, means for moving
the same longitudinally in two directions, a switch extending from one ribbon-spool to
110 the other and adapted to be reciprocated, and a switch-moving mechanism consisting essentially of a lever and two oppositely-moving arms adapted one to move the switch in one direction and the other to move it in the opposite direction.
115

9. In a type-writing machine, the combination of an inking-ribbon, means for moving
the same in two directions, a switch connected thereto and provided with a lug, a lever, and
120 two arms attached thereto, one of which is adapted to pull the switch in one direction, and the other to push it in the opposite direction.

10. In a type-writing machine, the combination of an inking-ribbon, means for moving
125 the same in two directions, a switch connected thereto and provided with a lug, a lever provided with two arms pivoted on opposite sides of the fulcrum of said lever, and a spring for pressing said arms together; the arrangement
130 being such that in one movement of said lever one arm is adapted to pull the switch in one direction, and in the movement of said lever in the opposite direction the other of said

arms is adapted to push said switch in the opposite direction.

11. In a type-writing machine, the combination of an inking-ribbon, means for moving the same longitudinally in two directions, a switch connected thereto, a lever provided with oppositely-moving pulling and pushing arms, a spring for pressing said arms together, means for depressing one of said arms, and means for lifting the other of said arms during the vibrations of said lever.

12. In a type-writing machine, the combination of an inking-ribbon, means for moving the same longitudinally in two directions, a switch, a lever provided with oppositely-moving spring-pressed pivoted arms, arranged one above the other, and the lowermost arm having a shoulder and a cam to act against the opposite sides or ends of a lug or abutment on the switch.

13. In a type-writing machine, the combination of an inking-ribbon, means for moving the same longitudinally in two directions, a switch having a lug or abutment, a lever, a pair of oppositely-moving spring-pressed pivoted arms arranged one above the other, the upper arm having a hook and a cam, and the lower arm a shoulder and a cam.

14. In a type-writing machine, the combination of an inking-ribbon, means for moving the same in two directions, a switch connected thereto, a spring-actuated lever carrying oppositely-working switch-moving arms, a latch device connected to said lever, and a catch for said latch device.

15. In a type-writing machine, the combination of an inking-ribbon, means for moving the same in two directions, a switch, a spring-

actuated lever provided with oppositely-working switch-moving arms, a sliding plate connected to said lever and adapted to be moved by the paper-carriage, and a catch for said plate and lever.

16. In a type-writing machine, the combination of an inking-ribbon, a pair of ribbon-spools, means for turning said spools, a switch connected thereto, a spring-actuated lever carrying a pair of oppositely-moving arms, a sliding plate connected to said lever and having an inclined slot, a spur, a notch and a cam, a pivoted and weighted lug on the paper-carriage to engage said spur, a catch to engage said sliding plate, a spring, and the arms adapted to be depressed by the pressure of the ribbon to release said plate and to be elevated by said spring when the pressure of the ribbon is removed.

17. In a type-writing machine, the combination of an inking-ribbon, means for moving the same longitudinally in two directions, a switch connected thereto and extending from one ribbon-spool to the other and adapted to be reciprocated, and a spring-actuated switch-moving mechanism, comprising a lever carrying two oppositely-moving and alternately-working actuating members, one adapted to move the switch in one direction and the other to move it in the opposite direction.

Signed at Hartford, in the county of Hartford and State of Connecticut, this 26th day of May, A. D. 1894.

CHAS. H. SHEPARD.

Witnesses:

JOHN MCCARTHY,
GEO. W. DICKERMAN.