

C. F. TAYLOR.
TYPE WRITING MACHINE.

No. 511,374.

Patented Dec. 26, 1893.

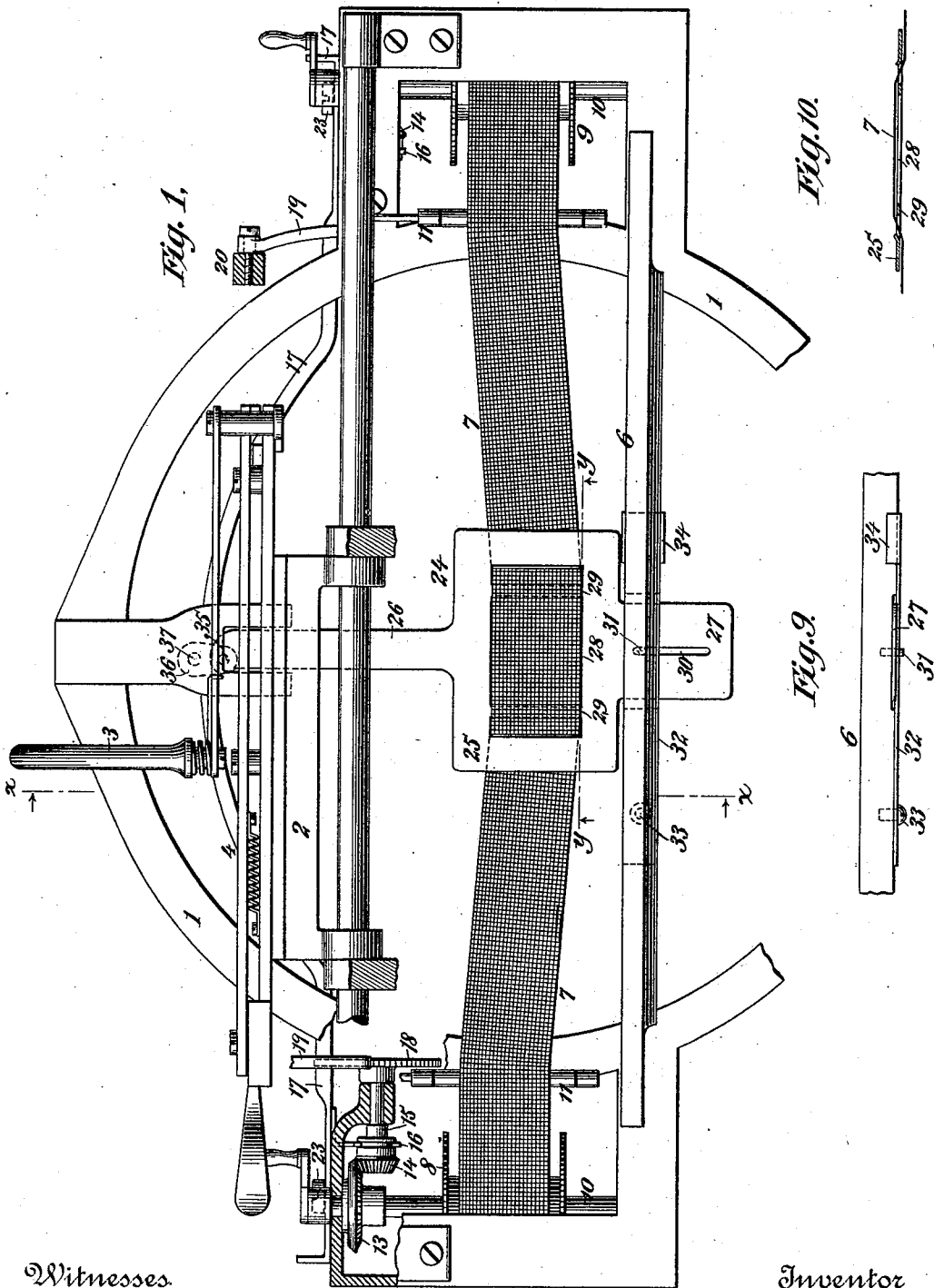


Fig. 1.

Fig. 10.

Fig. 9.

Witnesses
C. E. Ashley
W. Lloyd.

Inventor
Chas. F. Taylor
By his Attorneys
Sonnely & Felbel

C. F. TAYLOR.
TYPE WRITING MACHINE.

No. 511,374.

Patented Dec. 26, 1893.

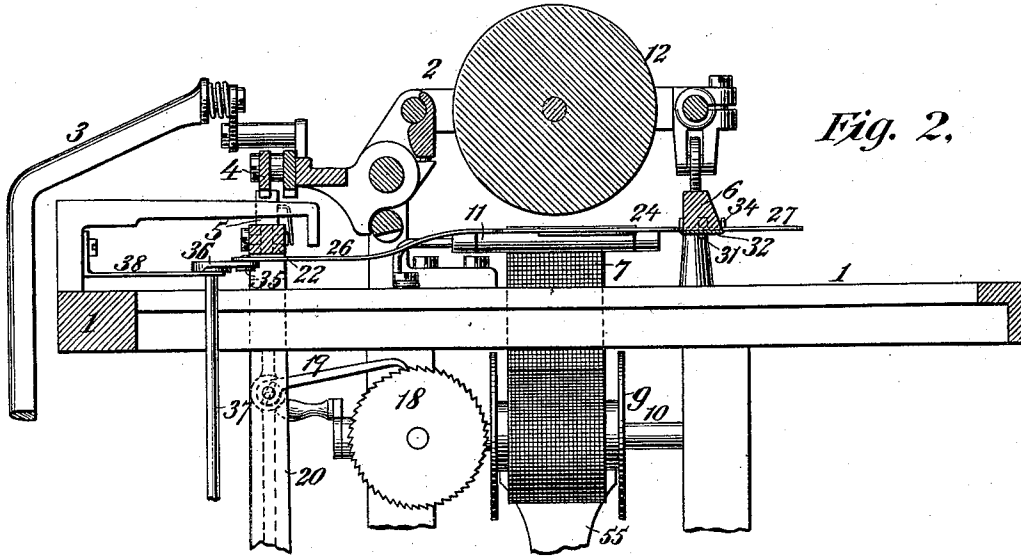


Fig. 2.

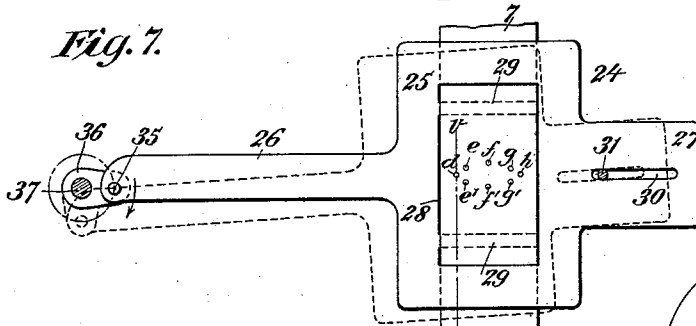


Fig. 7.

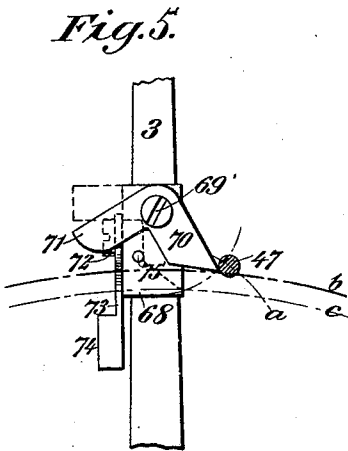


Fig. 5.

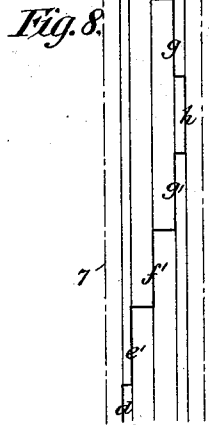


Fig. 8.

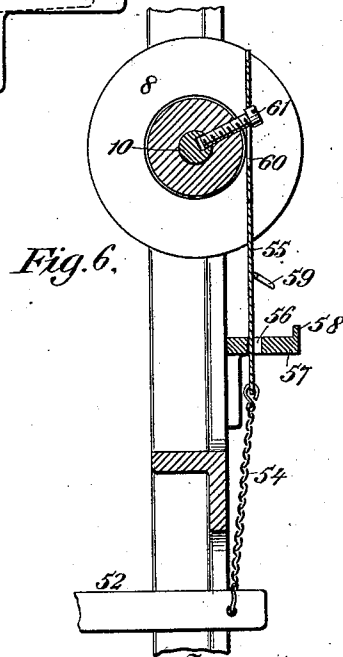


Fig. 6.

Witnesses
C. E. Ashley
H. W. Lloyd.

Inventor
Chas. F. Taylor.
 By his Attorneys
Sonnely & Felbel.

C. F. TAYLOR.
TYPE WRITING MACHINE.

No. 511,374.

Patented Dec. 26, 1893.

Fig. 3.

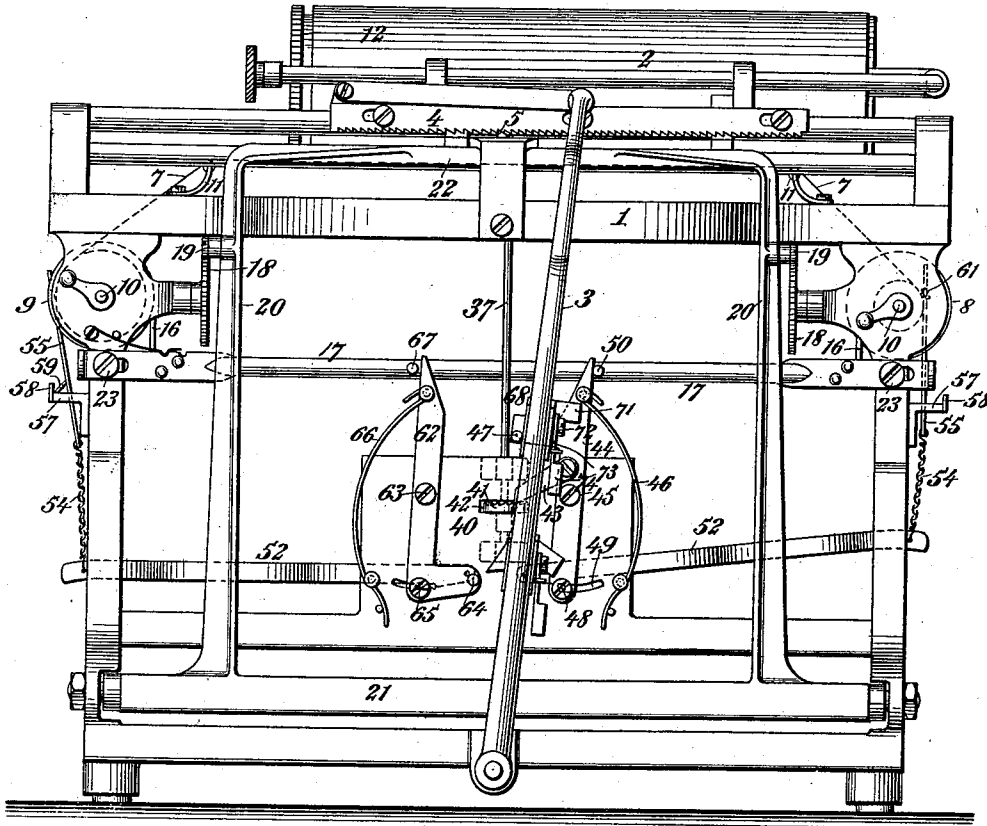
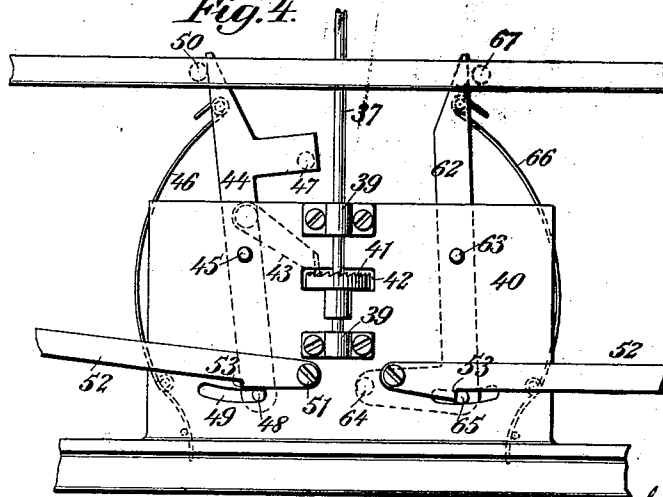


Fig. 4.



WITNESSES:

R. H. Kayrock
Ida C. Macdonald

INVENTOR

Chas. F. Taylor

BY

Sonnely + Fehel
 ATTORNEYS.

UNITED STATES PATENT OFFICE.

CHARLES FAYETTE TAYLOR, OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 511,374, dated December 26, 1893.

Application filed May 27, 1893. Serial No. 475,753. (No model.)

To all whom it may concern:

Be it known that I, CHARLES FAYETTE TAYLOR, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvement in Type-Writing Machines, of which the following is a specification.

My invention relates to that class of type writing machines employing an inking ribbon, and has for its main objects to provide simple and efficient means for automatically moving the ribbon widthwise, and also for automatically reversing the longitudinal movement of the ribbon.

To these ends my invention consists in the various features of construction and combinations of devices hereinafter more fully described and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a top plan view of a portion of a type writing machine showing some of my improvements. Fig. 2 is a vertical section thereof taken at the upper portion of the machine, and at the line *x, x* of Fig. 1. Fig. 3 is a rear elevation of the machine. Fig. 4 is an enlarged detail view, looking from the front of the machine, of some of the devices employed to reverse the movement of the ribbon, and also to move the same widthwise. Fig. 5 is an enlarged detail view, looking from the front of the machine, of a portion of the carriage driving arm and one set of the devices thereon employed to actuate the ribbon reversing levers, the pin or projection on one of said levers being also shown. Fig. 6 is an enlarged vertical section to illustrate the construction and operation of the parts employed in connection with the reversal of the ribbon. Fig. 7 is a plan view of the ribbon-carrier and the crank or eccentric for moving the same, and showing also a portion of the ribbon. Fig. 8 is a diagram to show the manner in which the ribbon is used, or the lines upon which it is struck by the types at different times. Fig. 9 is a detail view, in front elevation, of the means for supporting the forward end of the ribbon carrier; and Fig. 10 is a vertical section taken at the line *y, y* of Fig. 1.

In the several views the same parts will be

found designated by the same numerals and letters of reference.

I have shown my present improvements carried out in that form of machines known as the "Caligraph," but since they may be embodied in other styles or constructions of machines, I do not of course wish to be confined thereto.

The mechanism for reversing the ribbon automatically herein shown and to be described is the joint invention of myself and Harold P. Brown, and is set forth and claimed in another application filed simultaneously herewith by myself and said Harold P. Brown. In this case, therefore, I intend to cover said mechanism only in so far as it relates to or co-operates with the means which I personally have devised for automatically moving the ribbon widthwise.

1 designates the top-plate or type-ring, 2 the paper carriage, 3 the spring-actuated driving arm therefor, 4 the carriage feed-rack, 5 the feed-dog, and 6 the front supporting rail or track for the paper-carriage.

The inking ribbon 7 is connected at one end to a spool 8 at the left hand side of the machine (considered from the front), and at its other end to another spool 9 at the right hand side of the machine, each of said spools being mounted upon and adapted to rotate with a shaft 10. The ribbon passes from one of said spools upwardly and inwardly over a guide and support 11, and thence horizontally across the machine under the platen 12, to and over another guide and support 11 and then downwardly and outwardly to the other spool. At the rear end of each spool shaft 10 is secured a bevel gear 13, with which a bevel gear 14 on a counter-shaft 15 is adapted at certain times to engage. The said gear 14 is adapted to slide longitudinally on the shaft 15, and also to rotate therewith, a fork 16 connected to a switch or shifter 17 being provided to slide the gear 14 into and out of engagement with the gear 13. The shaft 15 is turned step-by-step by a pawl-and-ratchet-mechanism, there being upon said shaft at its inner end a ratchet wheel 18, with which engages a driving pawl 19, mounted upon an arm extending from a rocker 21 near the base of the machine and connected as usual to the

universal-bar, which overlies the key-levers. (Not shown.) The arms 20 are preferably connected together at their upper ends by a horizontal bar 22, which carries the feed-dog.

5 The shifter 17 is slotted at its ends and supported by screws 23. When said shifter is moved toward the right the fork 16 at the right hand side thereof moves the right hand gear 14 into engagement with its associated gear 13, and thereafter at each forward movement of the arm 20 the spool 9 will be partially rotated and the ribbon wound thereupon. Upon such movement of the shifter toward the right the left hand gear 14 is simultaneously disengaged from its companion gear 13, and the ribbon spool 8 and its shaft are left free to pay off the ribbon on said spool in accordance with the pull or winding action of the spool 9. When the said shifter is moved in the opposite direction or toward the left the right hand gears 13 and 14 are disengaged and the left hand gears 13 and 14 are re-engaged and thereafter during the operation of the machine the ribbon is wound step by step back upon the spool 8 again. This mechanism for moving the ribbon longitudinally from one spool to another and then reversing it, by a hand movement of the switch 17, will be found more fully set forth in the Letters Patent granted to Fairfield and Francis February 4, 1890, No. 420,790. In connection with this mechanism I have shown my novel means for automatically moving the ribbon widthwise, but it will of course be understood that my improvements, now to be described, may be used in conjunction with other means for moving the ribbon longitudinally.

40 About centrally of the machine widthwise is arranged a ribbon carrier 24, which is adapted to be moved back and forth step by step in a direction practically at right angles to the longitudinal movement of the ribbon and to carry said ribbon in its said movements. Said ribbon carrier consists preferably of a frame 25, a shank 26, projecting rearwardly therefrom, and a tongue 27 projecting forwardly therefrom. The frame portion is provided centrally with a large opening, as at 50 28, for the passage therethrough of the types, and near each end of said opening is a transverse bar 29. In putting the ribbon in place upon the machine one end thereof is first passed under one end of the frame 25, then over one of the bars 29, then over the opening 28, and over the other bar 29, and then down under the opposite end of the frame 25, as shown at Figs. 1 and 10. By thus threading the ribbon or connecting it to the ribbon-carrier, the latter when reciprocated is adapted to carry the ribbon with it. The tongue 27 is provided with a slot 30 which embraces a guide pin 31 depending from the under side of the rail or track 6. A flat spring or narrow springy plate 32 having an upward tendency is fastened by a screw 33 to the under side of the track 6 and extends longitudinally

thereof in a manner to form a support for said tongue and hence for the front end of the ribbon-carrier. One end of the spring 32 is provided with a finger-piece 34 to enable the spring to be conveniently depressed when it may be desired to remove or displace the ribbon-carrier for the purpose of cleaning the type, making adjustments, &c.

75 The shank 26 of the ribbon-carrier is pivotally connected to a crank or wrist pin 35 on a crank or eccentric 36, which is mounted fast on the upper end of a vertical shaft 37, which has a bearing at its upper end in a bracket 38, and bearings at its lower end in brackets 39, secured to an upright plate or support 40, preferably cast integral with the frame work of the machine. Upon the shaft 37 at its lower end is horizontally arranged a crown ratchet wheel 41, the supporting plate 40 having an opening 42 for the accommodation of said ratchet wheel. A pawl 43 is adapted to engage with the teeth of said ratchet wheel to turn the shaft 37 intermittently and to effect through the crank and the ribbon carrier step-by-step widthwise movements of the ribbon.

The pawl 43 is preferably pivoted upon a lever 44 which is pivoted at 45 upon the plate 40, and which is provided with a spring 46 and two pins 47 and 48, the former being at the upper portion of the lever and the latter at the lower portion thereof, and working in an arc-shaped slot 49 in the plate 40. The uppermost end of the lever 44 is arranged to co-operate with a pin 50 extending rearwardly from the shifter 17, and at certain times, as will be presently explained, move said shifter toward the left to automatically reverse the direction of movement of the ribbon.

Pivoted at 51 on the plate 40 is a lever 52 having a notch or shoulder 53 to engage with the pin 48 of the lever 44 and lock or hold said lever against the tension of its spring 46. The outer end of the lever 52 is operatively connected to the ribbon spool 8 by means of a chain or flexible connection 54 and plate 55. The plate 55 is guided in a slot 56 in a bracket 57 having a ledge 58, and said plate is provided with a rest 59 and a perforation or opening 60. Normally the rest 59 bears upon the bracket 57, and the upper portion of the plate 55 has a tendency to lean always toward the ribbon spool shaft. A screw 61 is passed through the ribbon spool 8 and engages a longitudinal groove in the ribbon spool shaft. The head of said screw projects, and when the ribbon is unwound from said spool, said head engages the opening 60 in the plate and, by the continued rotation of said spool, lifts the same and the latch lever 52. When said latch lever is lifted the shoulder 53 is raised from the pin 48, and the lever 44 is released and vibrated by its spring 46, the upper end of the lever moving toward the left and causing the shifter to slide in the same direction and reverse the engagement of the two pairs of gears 13 and 14, in a manner such

that thereafter the ribbon will wind back upon the spool 8.

In order to automatically move the shifter toward the right when the spool 9 becomes empty, a lever 62 is pivoted at 63 upon the plate 40, and is provided at its lower end with two pins 64 and 65. The said lever 62 is also provided with a spring 66 and its uppermost end is adapted to co-operate with a pin 67 projecting rearwardly from the shifter 17. Means precisely like those just described with reference to the lever 44 are provided to lock or hold the lever 62 and to release the same when the spool 9 becomes empty; that is to say, there is provided a latch lever, as 52, a chain, as 54, a lifting plate, as 55, and a projection as 61 on the spool for raising said plate. Hence, when the ribbon has unwound from the spool 9, the latch lever is raised to unlock the lever 62, the latter is vibrated by its spring and the shifter is moved toward the right to change the engagement of the driving gears.

To provide a practicable contrivance, it is apparent that some means must be provided to re-set or re-lock the levers 44 and 62 after their respective operations upon the shifter, and for this purpose suitable devices are mounted on the carriage driving arm 3, which devices co-operate with the pins 47 and 64 on the levers 54 and 62, respectively, during certain movements of the paper-carriage and carriage driving arm toward the right.

The devices for re-setting or re-latching each of the spring actuated shifter levers are similarly constructed and operate in substantially the same manner.

I shall now refer to that group of devices which is employed to re-set the lever 44. On the inner face of the driving arm is a block 68 to which is pivoted at 69 a pawl or driver 70, having an extension 71. On the left hand side of the block is pivoted at 72 a bent lever 73, which is weighted, as at 74, at its lower end, and is adapted to work upon the extension 71 in such a manner as to maintain the pawl 70 always in such a position that it will engage with the pin 47, when the lever 44 has been released, and during the sweep of the driving arm toward the right.

By referring more particularly to Fig. 5, the re-setting operation will be more readily understood. In that view the lever 44 is supposed to have been released and its pin 47 thrown up in the arc *a* into the path of the point of the pawl 70 which normally travels in the arc *b*. When, however, the pin 47 is in the position shown at said figure, and the point of the pawl in moving to the right strikes the same, the pawl is first independently vibrated about its own pivot until its rear edge strikes against a stop or pin 75 projecting from the block. Thereafter, the point of the pawl, during its engagement with the pin 47, travels in the arc *c*. When the independent vibration of the pawl has been arrested by the stop 75 the pin 47 is acted upon

positively and driven by said pawl during the continued sweep of the arm 3 toward the right, due to the pull upon the carriage by the arm of the operator, and the lever 44 is vibrated, as the pin 47 is forced down in the arc *a*, until the pin 48 on the lever 44 is brought into alignment with the notch 53 of the latch lever, when the latter at once descends and effects a locking of the lever 44 against the tension of its spring. During this re-latching of the lever 44, the driving pawl 43 thereon is moved forward a tooth or step on the crown ratchet wheel and turns the latter, its shaft, and the crank 36, and through the latter the ribbon carrier and ribbon are moved one step or a slight distance in a direction widthwise of the ribbon. When this has been accomplished the types will use the ribbon in a new or fresh line longitudinally of the ribbon. Inasmuch as the pawl 43 turns the crown ratchet wheel 41 only when the ribbon begins to wind upon the spool 8 it will be seen that the ribbon is used in one line only lengthwise while traveling from the spool 9 to the spool 8 and back again; or, in other words, the ribbon is shifted widthwise one step only during two of its longitudinal movements, but of course if desired by the manufacturer, another pawl similar to 43 may be connected to the shifter lever 62 to move the ribbon widthwise a step when said lever is re-set, thus providing for a widthwise movement of the ribbon for each longitudinal movement thereof.

By referring to Fig. 7, the small circle *d* may represent the printing point of the machine, and the line *v* the vertical axis or lowermost portion of the platen which travels over or coincident with said printing point. This line may also represent the line of impressions. As each type strikes at the point *d* the ribbon is moved longitudinally during the step-by-step spacing of the carriage in writing, and the ribbon is used at this time lengthwise along the line *v*, portions of said ribbon along said line being successively brought coincident with the printing point. At this time the crank and the ribbon-carrier are supposed to be in the positions shown by the full lines at Fig. 7. In the course of time when the pawl 43 partially turns the ratchet wheel the crank is turned one step in the direction of the arrow at Fig. 7, and a fresh portion of the ribbon will be moved rearwardly to register with the impression point. This portion may be represented by the small circle *e*. Thereafter the ribbon will be used in a line coincident with *e*. When the ribbon carrier is moved again a portion of the ribbon represented by the circle *f* is brought to register with the impression point. Then the ribbon will be used longitudinally along the line coinciding with *f*. Afterward when another movement of the carrier is made the ribbon will be used along the line coinciding with *g*, and then in like manner subsequently, along a line coin-

cident with *h*. When the portion of the ribbon last mentioned is being used the crank has made a half revolution, and on the return stroke the ribbon is again successively used on the parallel lines *g'*, *f'* and *e'*, which will all substantially coincide with the parallel lines represented by *g*, *f*, and *e*. At Fig. 8, the lines represented by the small circles just above referred to, and on which the ribbon is used, are diagrammatically illustrated.

The re-latching of the lever 62 is effected by a set of devices on the driving arm 3 arranged beneath the set of devices for re-latching the lever 44, and since they act upon the pin 64 in precisely the same manner no further description thereof appears to be necessary.

If the carriage driving arm should be on the right hand side while either lever 44 or 62 is in an unlatched condition, the pawl of either re-setting mechanism, on colliding with the pin 47 or 64 during the step-by-step movement of the paper-carriage toward the left will tilt and ride over the same and then be righted by the weighted bent lever, after passing the pin.

At Figs. 3 and 4, the spring acting lever 44 is shown unlatched, and the spring acting lever 62 latched.

It will be seen that the ribbon carrier is arranged substantially at right angles to the longitudinal travel of the ribbon and guides and controls the ribbon at or in the vicinity of the impression point. In other words, the ribbon is forced by said carrier to travel past the impression point in a series of parallel lines determined by the various positions which the carrier is caused to occupy during the step-by-step movements of the crank, which, as explained, occur only at the conclusions of the longitudinal movements of the ribbon, or when the ribbon is reversed to travel lengthwise in opposite directions. Thus by means of the centrally arranged carrier, the travel of the ribbon is controlled at the impression point irrespective of any movements of the ribbon spools on their shafts and the ribbon is used practically for its entire width in parallel lines running longitudinally of the ribbon. It will also be seen that by my invention the ribbon is moved widthwise step-by-step, by means wholly disconnected from the finger key action, and hence the fingers of the operator are relieved from performing any extra duty. As the widthwise movements of the carriage are effected through the movements of the carriage toward the right, which are made always by the arm of the operator, the power necessary to effect such ribbon movements is wholly imperceptible, and as during the return movement of the carriage there is such an abundance of surplus power, the force required to re-set either one of the shifter levers is not likewise felt or appreciated by the operator. The shifter levers are alternately re-set only at the completion of a longitudinal movement of the ribbon, and hence while the ribbon is moving lengthwise between shifts the re-set-

ting devices pass said levers inoperatively during the back and forth sweeps or movements of the carriage driving arm.

Various changes in detail construction and arrangement may be made without departing from the gist of my invention, and I do not wish to be limited to the use at one time of all of the mechanisms shown, as some may be employed without others.

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

1. In a type writing machine, the combination of a pair of ribbon spools, an inking ribbon, means for moving the same longitudinally from one spool to the other, a ribbon-carrier, and means connected to the paper-carriage for automatically moving said carrier and the ribbon widthwise at the end of the movement of the ribbon lengthwise, whereby the ribbon is used in parallel lines running longitudinally thereof.

2. In a type writing machine, the combination of a pair of ribbon spools, an inking ribbon, means for moving the same longitudinally from one spool to the other, a ribbon-carrier arranged in the vicinity of the impression point and guiding and controlling the movements of the ribbon thereat, and means for reciprocating said carrier at the conclusion of the longitudinal movements of the ribbon, for successively causing different portions of the ribbon widthwise to travel coincident with the impression point, whereby the ribbon is used longitudinally in substantially parallel lines and for substantially its whole width.

3. In a type writing machine, the combination of a pair of ribbon spools, an inking ribbon, means for moving the same longitudinally from one spool to the other, a ribbon-carrier arranged centrally of the machine and transversely of the line of longitudinal movement of the ribbon, and means for automatically reciprocating said carrier step-by-step at the conclusion of the longitudinal movements of the ribbon and thereby causing the ribbon to pass the impression point in a series of lines running longitudinally of the ribbon.

4. In a type writing machine, the combination of a pair of ribbon spools, an inking ribbon, means for moving the same longitudinally from one spool to the other, a ribbon carrier arranged in the vicinity of the impression point, and guiding and controlling the movements of the ribbon thereat, a crank or eccentric for reciprocating said carrier, and a pawl-and-ratchet-mechanism for moving said crank step-by-step.

5. In a type writing machine, the combination of a pair of ribbon spools, a paper-carriage, means for moving the same, an inking ribbon, means for moving the same longitudinally, a ribbon carrier arranged in the vicinity of the impression point and adapted to guide and control the movements of the ribbon thereat, a crank or eccentric for recipro-

cating said carrier, and a pawl-and-ratchet-mechanism operatively connected to the carriage driving power and arranged to be actuated on the return movement of the carriage.

5 6. In a type writing machine, the combination of a paper-carriage, a driving arm therefor, an inking ribbon, means for moving the same longitudinally, a ribbon-carrier arranged in the vicinity of the impression point, and means for intermittently reciprocating the same operatively connected to the carriage driving arm.

15 7. In a type writing machine, the combination of a paper-carriage, a driving arm therefor, an inking ribbon, means for moving it longitudinally, a ribbon carrier arranged in the vicinity of the impression point, a crank or eccentric connected thereto, a crank shaft, a pawl-and-ratchet-mechanism, and means for actuating the latter operatively connected to the driving arm.

20 8. In a type writing machine, the combination of a paper-carriage, a driving arm therefor, an inking ribbon, means for moving it longitudinally, a ribbon carrier arranged in the vicinity of the impression point, a crank or eccentric connected thereto, a vertically arranged crank shaft having a crown ratchet-wheel, a lever carrying a pawl adapted to said wheel, and a driver arranged upon said driving arm and adapted to vibrate said lever and cause its pawl to move the ratchet wheel one step on a movement of the driving arm toward the right.

35 9. In a type writing machine, the combination of a paper-carriage, a driving arm therefor, an inking ribbon, means for moving it longitudinally, a ribbon-carrier arranged in the vicinity of the impression point, a crank or eccentric connected thereto, a vertically arranged crank having a crown ratchet wheel, a spring actuated lever carrying a pawl adapted to said wheel and provided with a pin, and a pivoted driver on the driving arm adapted to engage said pin on a movement of the latter to the right.

40 10. In a type writing machine, the combination of a paper-carriage, a driving arm therefor, an inking ribbon, means for moving it longitudinally, a ribbon-carrier arranged in the vicinity of the impression point, a crank or eccentric connected thereto, a vertically arranged crank shaft having a crown ratchet wheel, a spring actuated lever carrying a driving pawl adapted to said wheel and provided with a pin, a latch mechanism for holding said lever against the tension of its spring until the spool becomes empty, a driver having an extension and pivoted on said driving arm, and a weighted bent lever for holding

said driver in the proper position to engage said pin, when the spring actuated lever has been released by the latch mechanism, on the return movement of the driving arm.

11. In a type writing machine, the combination of a paper-carriage, a driving arm therefor, a pair of ribbon spools, an inking ribbon, means for moving the same longitudinally, a shifter for reversing the longitudinal direction of movement of the ribbon, means for automatically moving said shifter when either spool becomes empty, a ribbon-carrier arranged at the vicinity of the impression point, and means for reciprocating the same connected to the means for reversing the ribbon and the means for driving the paper-carriage.

12. In a type writing machine, the combination of a paper-carriage, a driving arm therefor, a pair of ribbon spools, an inking ribbon, means for moving the same longitudinally, a shifter for reversing the longitudinal direction of movement of the ribbon, a pair of spring actuated levers connected to said shifter, a latch mechanism for each of said spring actuated levers operated by one of said spools, means for re-setting said levers carried by the driving arm, a ribbon-carrier arranged in the vicinity of the impression point, a crank or eccentric, a vertically-arranged crank shaft, a ratchet wheel thereon, and a pawl carried by one of said spring actuated levers and adapted to turn said ratchet wheel during a vibration of said lever.

13. In a type writing machine, the combination of a paper-carriage, means for moving the same, the track or rail 6, having a pin 31, an inking ribbon, means for moving the same longitudinally, a reciprocatory ribbon-carrier comprising an open frame, a slotted tongue, and a shank, and a movable supporting plate for said tongue.

14. In a type writing machine, the combination of a paper-carriage, means for moving the same, the track or rail 6, having a pin 31, an inking ribbon, means for moving the same longitudinally, a ribbon-carrier consisting of an open frame, a slotted tongue, and a shank, an intermittently-actuated crank or eccentric connected to said shank, and a depressible spring 32 secured to the under side of said track or rail and adapted to support said tongue.

Signed at New York city, in the county of New York and State of New York, this 20th day of May, A. D. 1893.

CHARLES FAYETTE TAYLOR.

Witnesses:

JACOB FELBEL,
IDA C. MACDONALD.