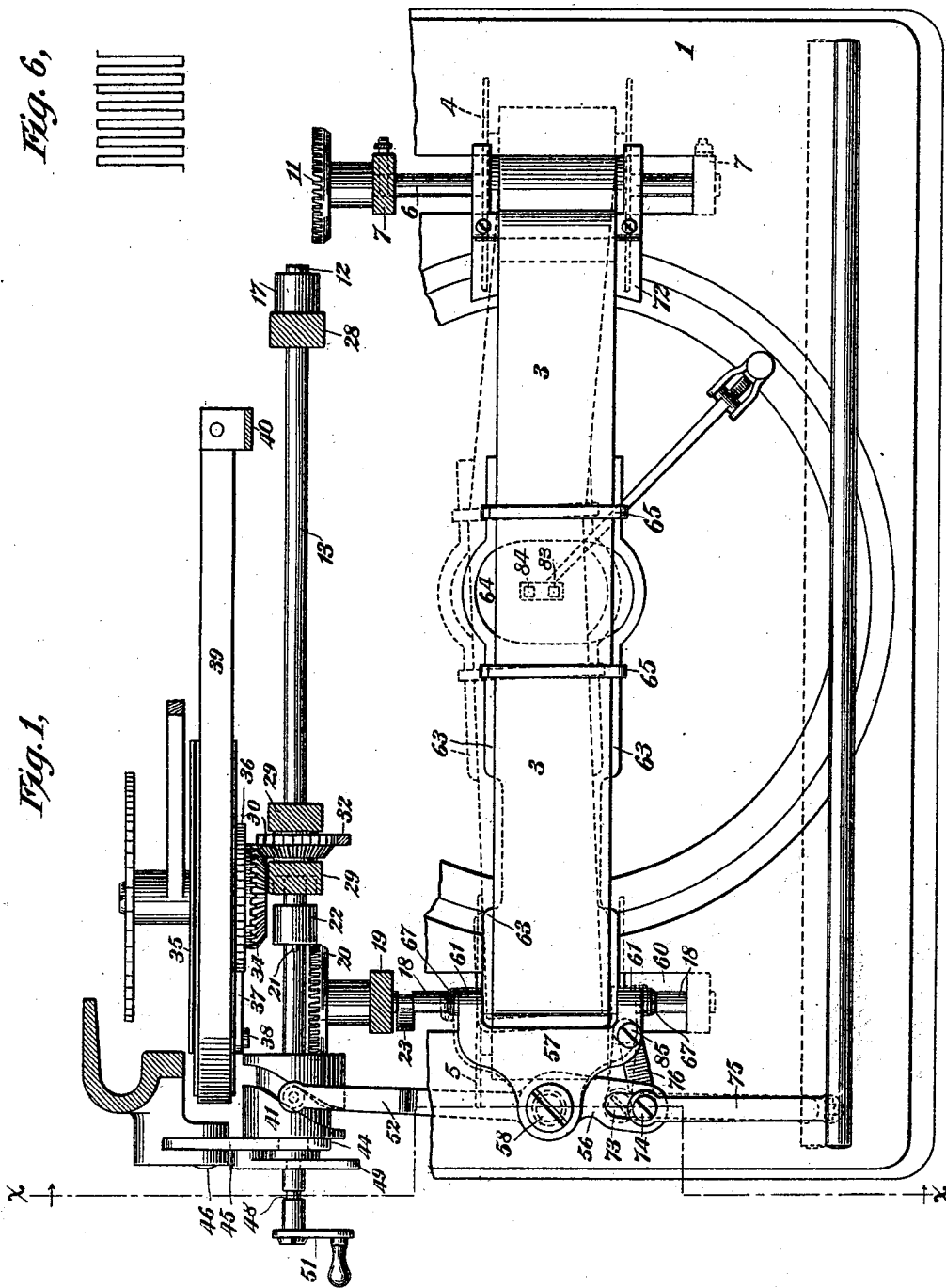


L. P. DISS.
TYPE WRITING MACHINE.

No. 516,300.

Patented Mar. 13, 1894.



Witnesses

C. E. Ashley
H. W. Lloyd.

Inventor

Louis P. Diss
By his Attorneys
Donnelly & Fabel,

(No Model.)

2 Sheets—Sheet 2.

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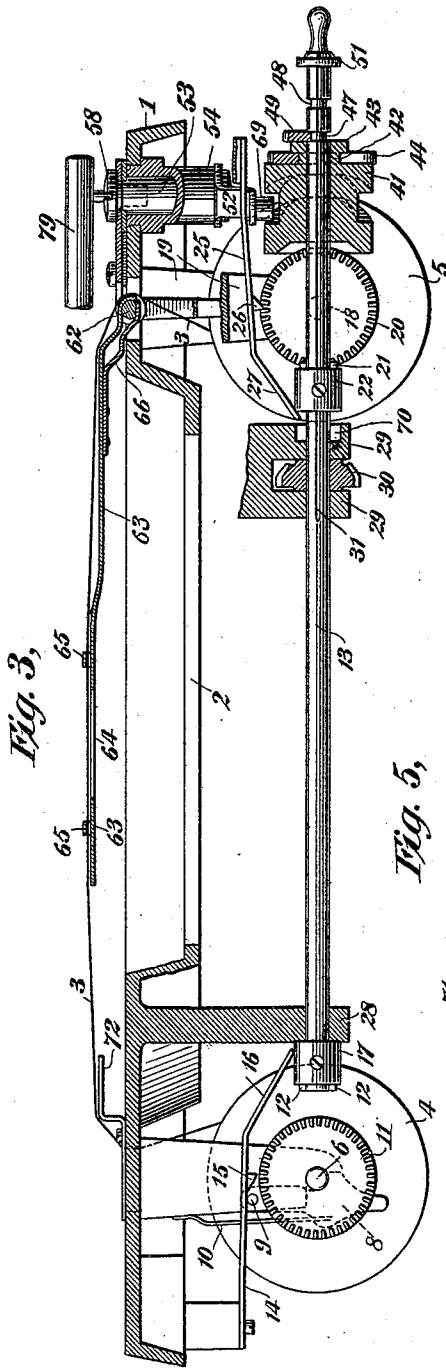


Fig. 2,

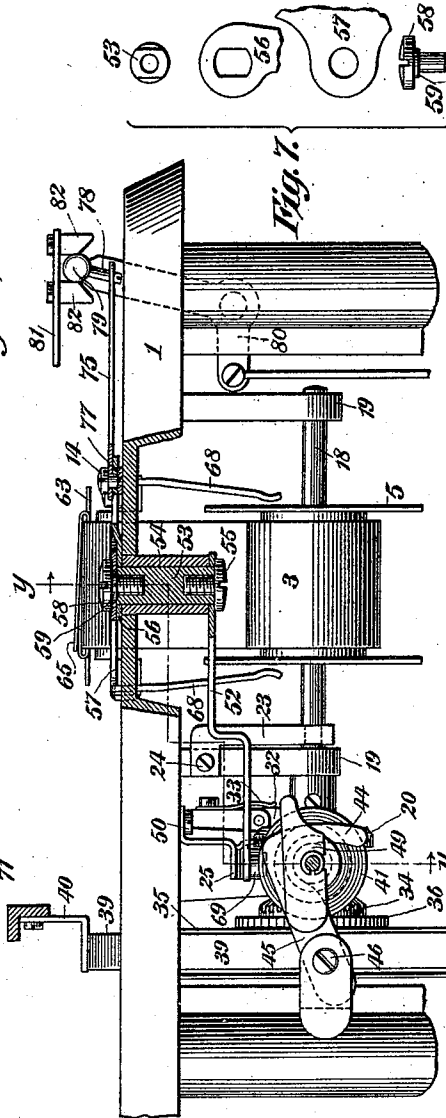


Fig. 5,

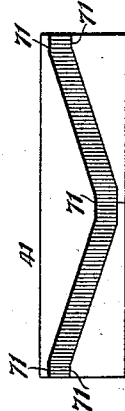


Fig. 4,

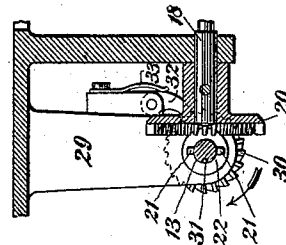
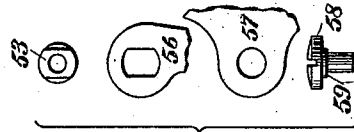


Fig. 7,



Witnesses

C. E. Ashley
W. W. Lloyd.

By his Attorneys

Inventor

Louis P. Diss

Donnelly & Felbel.

UNITED STATES PATENT OFFICE.

LOUIS P. DISS, OF ILION, ASSIGNOR TO THE WYCKOFF, SEAMANS & BENEDICT,
OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 516,300, dated March 13, 1894.

Application filed December 31, 1892. Serial No. 456,865. (No model.)

To all whom it may concern:

Be it known that I, LOUIS P. DISS, 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 invention has for its main objects to provide efficient means for moving an inking ribbon automatically both lengthwise and widthwise, and also for shifting the inking ribbon laterally, in machines provided with a plurality of types on each bar, in order that the upper and lower case types may strike at the same place on the ribbon; and to these main ends my improvements consist 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 represents, in plan view, my several improvements, enough of a "Remington No. 2" type writing machine being exhibited to illustrate the application thereto of my invention. Fig. 2 is a vertical section taken at the line *x, x* of Fig. 1, with part of the platen-carrier added. Fig. 3 is a similar section taken at the line *y, y* of Fig. 2. Fig. 4 is a sectional end view taken at the left hand side of the machine. Fig. 5 is a plan view of the actuating cam developed. Fig. 6 is a diagrammatic view, showing the lines in which the ribbon is used; and Fig. 7 is a detail view.

In order to simplify the views I have omitted the key levers, connecting-rods, escapement mechanism, &c., and have shown only one type bar and a portion of the paper-carriage and platen-carrier of the well-known "Remington No. 2" machine, to which I have applied my improvements in practice, and to which said improvements are more especially adapted, although some of them may be employed in other kinds or constructions of machines.

In the several views the same parts will be found designated by the same numerals of reference.

1 designates the top-plate, and 2 the type-ring of a "Remington No. 2" machine. Upon said type-ring are secured in the usual man-

ner the type-bars or levers having each two types, commonly designated "upper" and "lower" case types.

3 is an inking ribbon connected at one end to a spool 4 on the right hand side of the machine, and at the other end to a spool 5 on the left hand side of the machine, and adapted to travel across the machine, from one spool to the other, centrally of the type-ring and beneath the usual platen.

The spool 4 is mounted to turn with a shaft 6 supported in hangers 7 depending from the top-plate. The said hangers are hook-shaped at their lower ends and form partial bearings for the shaft. The remainder of each bearing is formed by a latch-piece 8, pivoted at 9 upon the hanger and provided with a spring 10, which serves to keep said latch-piece in proper position, to co-operate with the bearing in its associated bracket, and thus properly support the ribbon-spool shaft. By this construction the ribbon-spool and its shaft may, when desired, be removed from the machine. On the rear end of the spool shaft 6 is a crown wheel 11, with which is adapted to engage one or more teeth 12 (preferably two) on a driving shaft 13 arranged at right angles to the spool-shaft 6, the said teeth forming a partial or incomplete gear wheel.

Secured to the top-plate, or a projection therefrom, is a spring-arm 14, which is formed or provided with a detent 15 adapted to engage the crown wheel 11 on the said shaft 6 and prevent the same and its ribbon-spool from rotating in a direction opposite to that in which the ribbon spool is winding. The said arm 14 is provided with a downwardly-bent extension or finger 16, which in one position of the arm 14 (viz., that shown at Fig. 3,) is adapted to rest upon an enlargement or collar 17 on said shaft and hold the detent 15 out of engagement with said crown wheel.

The ribbon spool 5 on the left is splined on a shaft 18, which is held in bearings in depending brackets 19, and which at its rear-most end is provided with a crown wheel 20, adapted to be engaged by a tooth or teeth 21 (preferably two) on a collar 22 fast on said shaft 13, said teeth forming a partial or incomplete gear wheel. In order to prevent said shaft 18 from rotating too freely a spring

23 secured at 24 to one of the hangers 19 bears at its free end in a groove in said shaft. A spring-arm 25, attached in a manner similar to the spring-arm 14 and formed with a detent 26, is provided to prevent the crown wheel 20 and its spool from turning backward when the mechanism is adjusted for said spool to wind the ribbon upon itself. The said arm 25 is provided with an extension or bent finger 27, which is adapted to be acted upon by the collar 22 to lift said detent out of engagement with its crown wheel, in order that the spool may rotate in a reverse direction and pay off the ribbon previously wound thereupon.

The shaft 13 is mounted in bearings in hangers 28 and 29, the latter being bifurcated to receive between its forks a toothed wheel 30, which is mounted upon the shaft 13. The shaft 13 is provided with a longitudinal groove 31 at its left hand portion, and the toothed wheel 30 is provided with a feather 31 which enters said groove, whereby the said wheel may turn with said shaft, and the shaft 25 may be moved longitudinally independent of said wheel. The said wheel is provided with gear teeth on its bevel portion, and with ratchet teeth on its circular portion or perimeter, and with the latter engages a detent or dog 32, pivoted on a block secured to the hanger 29, and provided with a spring 33 to keep said detent always in engagement with said ratchet teeth, by which the shaft 13 may turn in one direction only. With the beveled teeth of the wheel 30 engages a bevel gear 34, mounted axially, but independently, of a spring driving-drum 35, and formed or provided with a ratchet-wheel 36, with which engages a spring-actuated driving-pawl 37 pivoted at 38 upon the spring-drum. The spring-drum is provided with a strap or band 39, which is secured to some part of the carriage, a portion of which is represented at 40. As in the Remington carriage-feed, these devices operate to turn the shaft 13 step-by-step during the travel of the carriage from right to left and permit the said shaft to remain at rest during the return movement of the carriage from left to right.

On the shaft 13 near its left hand end is mounted a grooved cam 41, which has a feather to engage the groove 31 in said shaft, in order that the cam may turn with the shaft, and the shaft be moved lengthwise independently of the cam. The outer end of the cam is provided with a short neck 42 and a circular flange 43, thus forming between the flange and the end of the cam a groove, into which enters a latch or hook 44 formed on an arm 45, pivoted at 46 in a bracket extending from one of the uprights or posts of the main-frame. The said latch or hook prevents any outward or inward movement of the cam on the shaft 13, and hence maintains the same always in its proper position, notwithstanding the longitudinal movements of the shaft 13. The said shaft 13 is provided with two

grooves 47 and 48, into either of which may take a latch 49 formed integral or rigid with the latch 44. The latch 49 is provided to hold the shaft 13 positively in either of the two positions to which it may be moved. In the position shown at Fig. 3, the latch 49 engages the groove 47, and the shaft 13 is locked in a position to drive the left hand spool. By lifting said latch and pushing the shaft 13 endwise the groove 48 may be brought into the plane of the latch, and the latter then dropped therein to hold the shaft in its shifted position, and in a position to drive the right hand spool. The hook or latch 44 is considerably longer than that marked 49, in order that the raising of the latch 49, to effect a longitudinal movement of the shaft 13, may not result in simultaneously unlocking the cam, both latches swinging from the same pivot or center 46. In addition to elongating the hook or latch 44, the spring-arm 25 is so attached to the top-plate as to hang immediately over the upper end of the latch and prevent it from being lifted to an extent sufficient to detach it from the cam. The latch can be entirely swung away from the cam only after removing the screw 50, which holds the arm 25. Thus, there is no liability of a derangement of the parts. On the left hand end of the shaft 13 is a crank 51, by which the shaft 13 and the devices mounted thereupon may be turned independently of any movements of the paper-carriage or the spring-drum.

Engaging with the cam 41 is an arm or lever 52, which is connected to a vertical pivot 53, adapted to turn in a tubular bearing 54 screwed into the top-plate and depending therefrom. The lower end of the pivot 53 is squared on two sides, and the front end of the arm or lever 52 is cut out to match the shape of the lower end of the pivot and is fitted thereupon, an upwardly-projecting screw 55 preventing the arm or lever from dropping off said pivot. The upper end of said pivot 53 is likewise squared on two sides, and upon the same is fitted a plate 56 having an aperture to match. (See Fig. 7.) Upon said plate lies another plate 57, which is provided with a round perforation, through which passes downwardly a screw 58, whose shank enters a threaded hole in the pivot 53, and whose head bears down upon the upper surface of the plate 57. Immediately beneath the head of the screw and formed integral therewith is a circular collar or flange 59, which fills the perforation in the plate 57, and which bears on its underside against the upper end or shoulder of the pivot 53. By the means described the plates 56 and 57 are rigidly connected to the pivot 53 and turn therewith.

The plate 57 projects inwardly toward the center of the machine, and at its free end, over an opening 60 in the top-plate, is forked to provide bearings 61 for a cross pin or bar 62, upon which, between the forks, is pivoted an arm 63, which extends inwardly past the

center of the machine. At the center the arm is provided with a large opening 64 for the passage of the types, and at either side of the said opening it is provided with a ribbon-guide 65. The arm 63 is provided on its under side with a spring-plate 66, which engages the under, flat side of the pivot pin or bar 62, about which the arm 63 may be swung up to a vertical position to raise the inking ribbon to a height such that the type may be conveniently cleaned or the type-bars repaired. The spring-plate 66 holds the arm in either its normal or raised position. At each end of the pivot pin or bar is secured, by a screw 67, an arm 68, which extends down to the outside of the ribbon-spool head 5.

The plate 57 and the arm 63 together may be designated the ribbon-carrier, since in the transverse movements of the ribbon, they operate practically as one. The arms 68 move the spool slightly back and forth on its shaft during the vibrations of the ribbon-carrier.

The arm or lever which serves to vibrate the ribbon-carrier through the rotations of the cam, is provided preferably at the end which engages with the cam, with an anti-friction roller 69.

Before proceeding to describe the means for shifting the ribbon laterally at the time of the shift for the upper case types, I shall proceed to describe the operation of the mechanism hereinbefore described for effecting the longitudinal and transverse movements of the ribbon during the use of the machine.

In the several views the main or driving shaft 13 is shown shifted to effect a winding of the ribbon upon the left hand spool. The ribbon is wound upon said spool periodically; that is to say, at the end of the transverse movement of the ribbon in each direction. As the carriage moves from right to left during use, the shaft 13 is rotated in the direction of the arrow at Fig. 4, and one of the teeth 21 at each half revolution of the said shaft engages a tooth of the crown wheel 20 and turns it and the ribbon spool shaft 18 and its spool one step, or the distance of one tooth, and winds upon said spool a portion of the ribbon equal about to the width of one type face. The pins or teeth 21, being set diametrically opposite to each other, of course operate to turn the ribbon-spool twice during one complete revolution of the shaft 13, and the movements are so timed that they occur at the end of the movement of the ribbon widthwise in each direction. But, if it be desired to move the ribbon lengthwise only once during a complete revolution of the shaft 13, or once for a complete back and forth movement of the ribbon transversely, then of course only one pin or tooth 21 will be employed. When the spool 5 may have been filled, or before if desired, the ribbon may be wound back upon the spool 4 by lifting the latch 43 and pushing the shaft 13 toward the right, as before explained, and this operation will throw out of gear the teeth 21 and crown

wheel 20 and into gear or operative relation the teeth 12 and the crown wheel 11, and thereafter during the rotations of the shaft 13 the ribbon will be wound from the spool 5 on to the spool 4 by the periodic rotations of its shaft through the intermittent actions of the teeth 12 upon the crown wheel 11. As explained of the pins or teeth 21, the pins or teeth 12 are arranged diametrically opposite. In shifting the shaft 13 back and forth for changing the direction of the longitudinal feed of the ribbon, the detents 15 and 26 are alternately engaged and disengaged from their respective crown wheels. When the shaft 13 is pushed endwise toward the right the collar 22, acting on the inclined arm 27, operates to lift the same and raise the detent 26 out of the plane of the crown wheel and to hold the same in such raised position until the shaft is pulled back again. The collar 17 acts upon the arm 16 to free the detent 15 from its associated crown wheel in a like manner, as will be apparent from an inspection of Fig. 3. In order to permit of the necessary movement of the collar 22 when the shaft 13 is moved toward the right the bracket 29 is cut-away or hollowed out at 70 to accommodate said collar. As will be seen, the cam 41 is a duplex one, capable of moving the lever 52 first in one direction and then back during one complete revolution of the cam or the shaft 13. In the positions of the parts shown at Fig. 1, the cam is acting to move the lever 52 toward the right and by reason of the connection of the ribbon carrier with the said lever, said carrier is oscillated and the ribbon moved forward. At the end of this forward movement of the ribbon carrier and ribbon, the ribbon is moved lengthwise, as before explained, and during such lengthwise movement of the ribbon there is preferably a cessation of widthwise movement of the ribbon. This is effected by providing the cam with a flat or inactive portion 71 at diametrically opposite points, and when said flat portions arrive at the anti-friction roller of the lever 52, the vibration of said lever ceases, and at the same moment the means for moving the ribbon lengthwise come into play. Immediately this movement has been concluded, the inclined portion or the other half of the cam commences to act on the lever 52 and to gradually vibrate said lever toward the left and cause the ribbon-carrier to oscillate, and the ribbon to move rearwardly step-by-step. At the completion of this movement of the ribbon and simultaneously with the arrival of the opposite flat portion of the cam in line with the anti-friction roller of the lever 52, the means for moving the ribbon lengthwise again come into action. Thus, the ribbon is moved step-by-step widthwise (in accordance with the step-by-step movement of the paper-carriage) first in one direction and then in the opposite direction, the types using its surface transversely in substantially straight lines, at right

angles to its edge, and at the end of each said widthwise movement the ribbon is moved or fed longitudinally for the purpose of putting into use a fresh field or portion, all as represented by the diagram at Fig. 6. As no movement of the ribbon takes place during the return of the carriage toward the right, the entire surface of the ribbon may be utilized, no matter what may be the length of the lines written. When it may be desired to wind the ribbon quickly from one spool on to the other for the purpose of changing ribbons, or removing old or adding new ones, the crank 51 may be turned by hand as rapidly as desired. As shown, the ribbon passes up from the spool 5 over the top of the ribbon carrier arm 63, thence underneath the guides 65 and over a fixed guide-plate 72 at the right hand side of the machine, and thence down through an opening in the top-plate to the spool 4. I have found in practice that one vibratory ribbon-carrier is all that is needed, though if desired two may be used. The spool 5 is carried a short distance on its shaft 18 first by one arm 68 and then by the other, according to the direction of oscillation of the ribbon-carrier, to which said arms are connected. By providing for the movement of the ribbon spool 5, as described, the ribbon may be wound on to and unwound from said spool without wrinkling or buckling.

I shall now describe the means for shifting the ribbon widthwise during the use of upper case characters. The plate 56 (which is an arm or lever) is provided with a slot 73 at its forward end, and at said slot are connected, by a screw-pin or pivot 74, a link 75 and a link 76, the former preferably passing over the plate and the latter under the same, a circular washer or filler 77, being placed at the forward end of the slot, and the screw or pivot-pin 74 passing through coinciding holes in the link 75 and washer, and its threaded point entering a threaded hole in the link 76. The link 75 at its front end is connected by a screw or pin 78 to a shift rod or rail 79, which as usual in the "Remington No. 2" machine, may be mounted upon bell-cranks or bent levers 80, connected to shift-keys at the key-board. The platen-carrier 81, which in the "Remington No. 2" machine is adapted to move back and forth in the main carriage, is connected to the said shift-rod or rail 79 by yoke-pieces or hooks 82 in the usual way so that when said rail is shifted rearwardly the platen-carrier is caused to move in the same direction and to return with it when the shift-key is released. It will of course be understood that in the forward position of the platen-carrier only the lower case types or characters 83 are adapted to strike the paper on the platen, and that in the rearward shifted position of the platen-carrier only the upper case types or characters 84 are adapted to strike the paper on the platen. Hence, when it may be desired to use upper case characters, the shift-key is actuated, the shift-rod is

moved rearwardly to the dotted line position shown at Fig. 1, and through said shift-rod the line being printed is moved back to coincide with the center at which all of the upper case characters strike. The link 76 is pivoted at 85 to the plate 57 and extends laterally and forwardly to the pivot pin 74. The slot 73 in the plate 56 is slightly inclined to form a cam or inclined plane, and when the shift-rod is moved rearwardly the washer or filler travels in said slot, and operates through its connection with the link 76 to oscillate the plate 57 and the arm 63, comprising the ribbon-carrier, about the pivot or axis 53, and thus throw the ribbon, at the vicinity of the printing point, rearwardly, as shown by the dotted lines at Fig. 1. The parts are so proportioned that this movement of the ribbon widthwise is about equal to the distance between the two types on a bar, as indicated at Fig. 1, and hence an upper and lower case type may strike the ribbon at the same spot. When the ribbon is thus shifted rearwardly through the shift-rod, the plate 56, the pivot 53, and the arm or lever 52 remain motionless, and only the plate 57 and the arm 63 with their attachments move, the plate 57 being free to swing axially and independently of the pivot 53.

By shifting the ribbon laterally with the platen neither type can be uncovered and thus fail to print, a narrower ribbon may be used, the ribbon may be more evenly exhausted, may yield a greater number of impressions, and may secure uniformity in the printing, thus improving the quality of the work performed.

When the ribbon is moved widthwise step-by-step during the operation of the machine, the plate 56 oscillates and the link 75 is vibrated, and the link 76 reciprocated, thus positively operating said ribbon-carrier.

Various changes in detail construction and arrangement may be made without departing from the main features of my improvements.

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

1. In a type writing machine, in which the ribbon has a step-by-step widthwise movement, the combination of a ribbon-spool, a gear wheel operatively connected to said spool, and a driving shaft having one or more teeth to intermittently engage said gear wheel and turn said spool and move the ribbon longitudinally at or about the end of the widthwise movement of the ribbon.

2. In a type-writing machine, in which the ribbon has a step-by-step widthwise movement, the combination of a ribbon-spool, a gear wheel operatively-connected thereto, and a driving-shaft arranged at right angles to the axis of said ribbon-spool and carrying one or more teeth to intermittently turn said ribbon-spool.

3. In a type writing machine, in which the ribbon has a step-by-step widthwise movement, the combination of a ribbon-spool, a

ribbon-spool-shaft, a gear wheel mounted on said shaft, a driving shaft arranged at right angles thereto, and one or more teeth carried by said shaft adapted to intermittently turn said gear wheel and partially rotate said ribbon-spool.

4. In a type writing machine, the combination of a ribbon, a ribbon-spool, a ribbon-spool shaft provided with a gear wheel, and a driving shaft arranged at right angles thereto and carrying one or more teeth adapted to intermittently turn said gear wheel and partially rotate said ribbon-spool.

5. In a type writing machine, the combination of a ribbon, a ribbon-spool, a ribbon-spool shaft provided with a gear wheel, a detent for said wheel, and a driving shaft arranged at right angles to said spool shaft and revolving normally independent of or disconnected from said spool-shaft and provided with one or more teeth which periodically only engage and partially turn said gear wheel.

6. In a type writing machine, the combination of a ribbon, a pair of ribbon spools, a pair of ribbon-spool shafts, a pair of gear wheels one on each of said shafts, and a driving shaft having an endwise movement and provided at two points with one or more teeth for engagement with each of said gear wheels, whereby either ribbon-spool may be intermittently turned.

7. In a type writing machine, the combination of a ribbon, a pair of ribbon-spools, a pair of ribbon-spool shafts, provided each with a gear wheel, a driving-shaft arranged at right angles thereto, and adapted to slide longitudinally, a detent for each of said gear wheels, one or more teeth on said driving shaft for intermittently turning each of said gear wheels and rotating said ribbon spools one at a time, and means for automatically disengaging one of said detents and re-engaging the other during the sliding movements of said driving shaft.

8. In a type writing machine, the combination of a ribbon, a ribbon-spool, a ribbon-spool shaft, a gear wheel, a detent therefor mounted on a spring-actuated arm, one or more teeth on said driving shaft for intermittently turning said gear wheel and its spool, and a collar or enlargement for disengaging the detent.

9. In a type writing machine, the combination of a ribbon, a ribbon-spool, a ribbon-spool shaft provided with a crown wheel, a detent mounted on a spring-actuated arm having an inclined or cam portion, a driving shaft having one or more teeth to intermittently turn said crown gear, and a collar or enlargement on said driving shaft.

10. In a type writing machine, the combination of a ribbon, a ribbon-carrier, adapted to oscillate about a vertical pivot or axis, a horizontally-arranged arm or lever connected to said pivot and said ribbon-carrier, a driving shaft, a cam mounted on said shaft and acting directly on said arm or lever to oscillate

the ribbon-carrier, a ribbon-spool shaft arranged at right angles to said driving shaft and mounted in bearings in the frame-work independently of said ribbon-carrier and arm or lever, and a ribbon spool mounted on said ribbon-spool shaft.

11. In a type writing machine, the combination of a ribbon, a vertically-pivoted ribbon-carrier, an arm or lever connected thereto, a driving shaft, a cam on said shaft, a spool shaft arranged at right angles to said driving shaft, and means connected with said ribbon-carrier for sliding the ribbon-spool endwise during the oscillations of the ribbon-carrier.

12. In a type writing machine, the combination of a ribbon, a ribbon-carrier consisting of the forked plate 57 and the arm 63 hinged between the forks of said plate, a vertical pivot for said ribbon-carrier, a horizontally-arranged arm or lever connected to said ribbon-carrier, a driving shaft, a cam thereon acting directly on said arm or lever to oscillate said ribbon, a spool-shaft, and a ribbon-spool.

13. In a type writing machine, the combination of a ribbon, a ribbon-spool, and a vertically-pivoted oscillatory ribbon-carrier consisting of the forked plate 57 and the arm 63 hinged within the fork of the said plate and extending inward longitudinally of the ribbon past the center of the machine and provided with an opening for the passage of the types and provided with a ribbon-guide on each side of said opening.

14. In a type writing machine, the combination of a ribbon, an oscillatory ribbon-carrier, a ribbon-spool, a gear connected thereto, and a driving shaft provided with a partial gear to intermittently turn said ribbon-spool at or about the end of the oscillation of said ribbon-carrier in one direction.

15. In a type writing machine, the combination of a ribbon, an oscillatory ribbon-carrier, a ribbon-spool shaft, a gear wheel on said shaft, a driving shaft, and a partial gear on said shaft for intermittently turning said ribbon-spool gear.

16. In a type writing machine, the combination of a ribbon, an oscillatory ribbon-carrier, an arm or lever connected thereto, a driving shaft, a cam on said shaft, a ribbon-spool, a gear wheel connected thereto, and a partial gear on said driving shaft.

17. In a type writing machine, the combination of an inking ribbon, a pair of ribbon-spools, a pair of ribbon spool shafts having each a gear wheel, an oscillatory ribbon-carrier, a driving shaft connected to said carrier and adapted to be shifted endwise, and a pair of partial gears on said shaft adapted one to each gear wheel.

18. In a type writing machine, the combination of a ribbon, a driving shaft, an oscillatory ribbon-carrier connected thereto, a cam mounted to turn with said shaft and also to permit the same to be moved endwise there-through, and a latch or locking means for preventing endwise movement of the cam.

19. In a type writing machine having a shiftable platen and type-bars with a plurality of types, an inking ribbon connected to the means for shifting the platen, whereby the ribbon is moved laterally simultaneously with the platen, as and for the purposes set forth.

20. In a type writing machine, the combination of a ribbon, a ribbon-carrier, a platen-carrier, a shifter therefor, and connections between the shifter and the ribbon-carrier for moving the latter when the shifter is actuated, whereby an upper and a lower case type may strike at the same place on the ribbon.

21. In a type writing machine, the combination of a ribbon, an oscillatory ribbon-carrier, a shift-rod connected to a platen-carrier, and a link or lever connection between said shift-rod and said ribbon-carrier.

22. In a type writing machine, the combination of a ribbon, an oscillatory ribbon-carrier, a shift-rod connected to the platen-carrier, a link connected to said shift-rod, a cam or inclined plane, and a link connection between the first mentioned link and the ribbon-carrier.

23. In a type writing machine, the combination of an inking ribbon, a ribbon-carrier,

the plate 56 having an inclined slot, the pivot 53, an arm or lever connected to said pivot, a duplex cam adapted to rotate always in the same direction, a shift-rod connected to the paper-carriage, the link 75 connected to the shift-rod, and the link 76 connected to the link 75 and the ribbon-carrier.

24. In a type writing machine, the combination with a platen, and type-bars having each an upper and a lower case character, of an inking ribbon arranged to be automatically shifted when the upper case types print, in order that said types may strike the ribbon at the same places that the lower case types strike.

25. In a type writing machine, the combination of a platen, means for shifting said platen cross-wise for upper case printing, and a ribbon connected to be shifted simultaneously with the platen.

Signed at Ilion, in the county of Herkimer and State of New York, this 28th day of November, A. D. 1892.

LOUIS P. DISS.

Witnesses:

A. D. RICHARDSON,
E. B. MAURICE.