No. 873,244. PATENTED DEC. 10, 1907.

J. W. KENNEDY.

RIBBON MECHANISM FOR TYPE WRITING MACHINES.

APPLICATION FILED JUNE 1, 1904. RENEWED JAN. 4, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

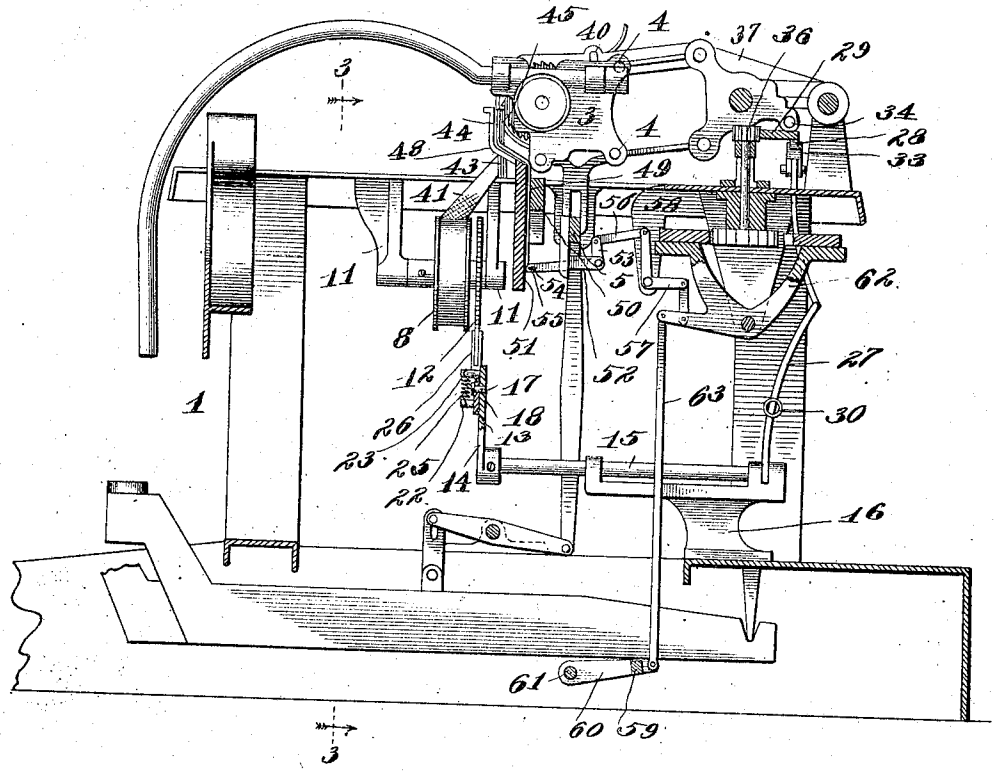
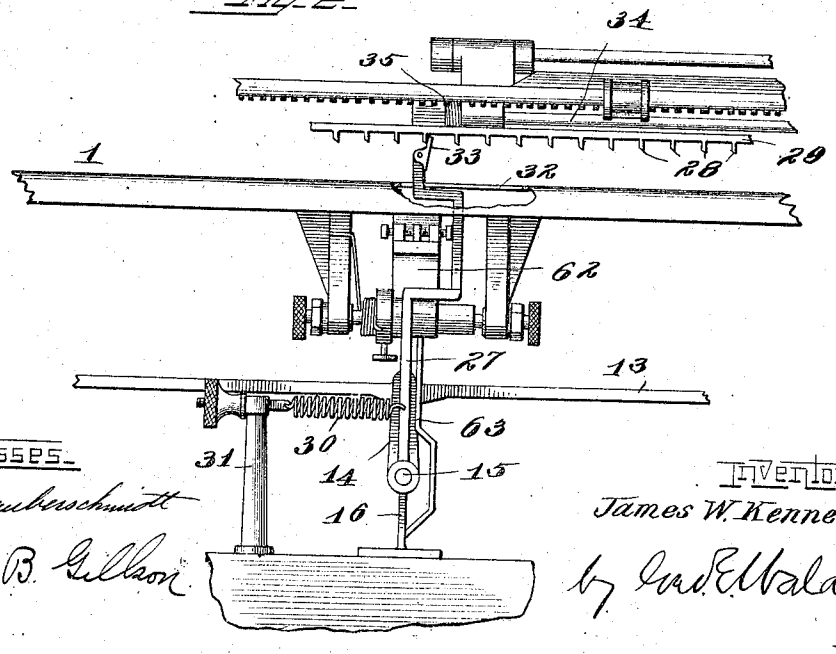


Fig. 2.



Witnesses.

G. A. Rauberschmidt

Chas. B. Gilson.

Inventor.

James W. Kennedy,

by Jno. E. Waldo,

Atty

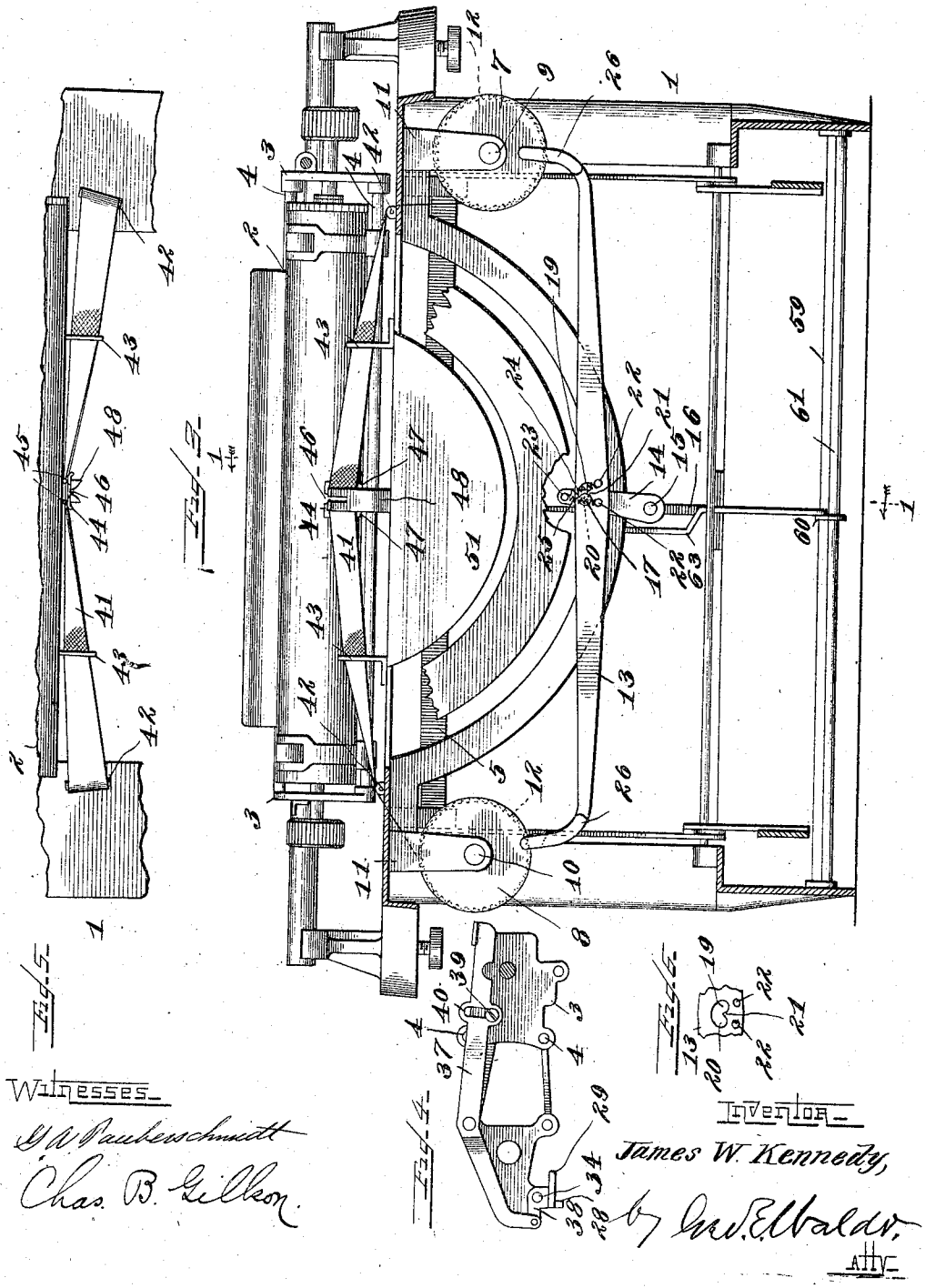
No. 873,244. PATENTED DEC. 10, 1907.

J. W. KENNEDY.

RIBBON MECHANISM FOR TYPE WRITING MACHINES.

APPLICATION FILED JUNE 1, 1904. RENEWED JAN. 4, 1907.

2 SHEETS—SHEET 2.



Witnesses—
G. A. Paubenschmidt
Chas. B. Gilkson.

Inventor—
James W. Kennedy,
by Jno. E. Waldo
Atty.

UNITED STATES PATENT OFFICE.

JAMES W. KENNEDY, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE KENNEDY TYPEWRITER COMPANY OF MANHATTAN, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

RIBBON MECHANISM FOR TYPE-WRITING MACHINES.

No. 873,244. Specification of Letters Patent. Patented Dec. 10, 1907.

Application filed June 1, 1904. Serial No. 210,758. Renewed January 4, 1907. Serial No. 350,822.

To all whom it may concern:

Be it known that I, JAMES W. KENNEDY, a subject of the King of Great Britain, residing at Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Ribbon Mechanism for Type-Writing Machines, of which the following is a complete specification.

This invention relates to typewriting machines and relates particularly to ribbon mechanisms therefor.

The object of the invention is to provide a simple and durable ribbon mechanism for typewriting machines, which will operate to automatically reverse the ribbon feed when the ribbon reaches the limit of movement in either direction.

To this end a ribbon mechanism of my invention consists of the various features, combinations of features and details of construction hereinafter described and claimed.

In the accompanying drawings, in which a ribbon mechanism of my invention is fully illustrated,—Figure 1 is a sectional side elevation on the line 1—1 of Fig. 3 of a machine embodying a ribbon mechanism of my invention. Fig. 2 is a partial rear elevation thereof. Fig. 3 is a sectional front elevation on the line 3—3 of Fig. 1. Fig. 4 is a left hand side view of the platen carriage showing the lever for disengaging the escapement rack bar; and Fig. 5 is a plan view of the ribbon and ribbon guides.

For purposes of illustration, I have, in the drawings, shown my improved ribbon mechanism as embodied in or applied to a vertical shift machine, which, as regards the manner of supporting and operating the platen, is substantially identical with the machine shown and described in an application for U. S. Letters Patent heretofore filed by me in the Patent Office on April 2, 1904, Serial No. 201,284, to which reference is made for a complete description thereof.

Referring now to the drawings, 1 designates the frame of the machine and 2 the platen thereof revolubly mounted in a pivoted frame, comprising end plates 3 rigidly connected by transverse rods 4, and 5 the bar on which the platen carriage is supported.

The ribbon 6 is wound upon spools 7 and 8 revolubly mounted on rods 9 and 10 secured in brackets 11 at opposite sides of the machine frame.

Rotation is adapted to be imparted to the ribbon spools 7 and 8 to feed the ribbon, in the following manner:—Secured to said spools 7 and 8 so as to rotate therewith are ratchet wheels 12, the teeth of which are adapted to be engaged by the opposite ends of a pawl arm or rod 13 pivoted to a crank arm 14 secured to a shaft 15 revolubly mounted in a suitable bracket 16 on the machine frame, the relation being such that, when said pawl arm 13 is in engagement with the teeth of either of the ratchet wheels 12, it will be disengaged from the other.

To provide for maintaining the pawl arm 13 in normal engagement with either of the ratchet wheels 12, as may be desired, said pawl arm 13 is mounted upon the crank arm 14 by means of a pivot shiftable lengthwise of said pawl arm and a spring or springs is or are applied to said pawl arm in such manner that the tension of said spring or springs will be varied as the pivotal point of said pawl arm is shifted, the relation being such that, when at either limit of its movement, there will be an unbalanced spring tension exerted on said pawl arm which will move the same pivotally so that in one extreme position one end thereof will be thrown into engagement with one of said ratchet wheels and in the other extreme position the opposite end thereof will be thrown into engagement with the other ratchet wheel. In the preferable construction shown, a pivot pin 17 is secured in the crank arm 14 which extends through a longitudinal slot 18 in the pawl arm 13 and is adapted to engage pivot bearings 19 and 20 at the ends of said slot, a projection 21 being formed on the side of the slot between said pivot bearings 19 and 20. Secured in the pawl arm 13 directly below the pivot bearings 19 and 20 are pins 22, which are connected with a pin 23 secured in the crank arm 13 directly above the pivot pin 17 by springs 24 and 25 of substantially equal strength. With this construction it is obvious that the springs 24 and 25 will exert an upward pull on the pawl arm 13 and will maintain the pivot pin 17 normally in engagement with one or the other of the pivot bearings 19 and 20. It is also obvious that, when said pivot pin is in engagement with one of said pivot bearings, as for example the pivot bearing 19, the tension on the spring 24 will be decreased and that said spring will

exert a pull in a substantially straight line connecting the pins 17 and 23, while the tension on the spring 25 will be increased and will be applied to the pawl arm 13 at a considerable distance from the pivot pin 17. Said spring 25 will thus exert an unbalanced pull on the pawl arm 13 in a direction to move the same pivotally to throw an end of said pawl arm into engagement with the ratchet wheel secured to the ratchet wheel 8 and vice versa.

Secured to the ends of the pawl arm 13 are guides which embrace the sides of the ratchet wheels 12 and insure engagement of said pawl arm with the teeth of said ratchet wheel in the designed manner. As shown, said guides consist of sheet metal clips 26 which are secured to the pawl arm by spring pressure, the web connecting the sides of said clip being cut away beyond the ends of said pawl arm to provide for the passage of the ratchet wheels.

Reciprocating movement is imparted to the pawl arm 13, as the machine is operated, to cause it to engage the teeth of the ratchet wheels 12 in the following manner:—Secured to the rear end of the shaft 15 is a lever arm 27, the upper end of which engages teeth 28 on a rack bar 29 on the platen carriage so as to be moved pivotally in one direction by the movement of said platen carriage under the influence of the main feed spring applied thereto, and is adapted to be moved pivotally in the opposite direction, as the teeth 28 pass over the end of the lever arm 27 whereby said arm is released, by a spring 30, which connects said lever arm with a rigid support, as shown a post 31 on the machine frame. Pivotal movement of said lever arm 27, under the influence of the spring 30 is limited by a suitable stop. As shown, said lever arm extends through a slot 32 in the top of the machine frame, the end of which forms the stop which limits the pivotal movement thereof in the desired manner.

In order that engagement of the lever arm 27 with the teeth 28 on the rack bar 29 may not interfere with retracting said rack bar and thus the platen carriage, a spring pawl 33 is pivoted to the end of said lever arm 27, pivotal movement of which, under the influence of the main spring, is limited by a suitable stop, said pawl being freely movable in the opposite direction. As shown, said pawl is formed of a piece of sheet metal bent so that the sides thereof will embrace the sides of the lever arm 27, the connecting web of which engages the rack teeth 28. As shown, also, said pawl extends below its point of pivotal attachment to the lever arm 27 and the pivotal movement thereof, under the influence of the platen carriage, is limited by contact of its connecting web with the edge of said lever arm.

In order that the rack teeth 28 may be disengaged from the lever arm 27, to provide for free movement of the platen carriage, transversely of the machine, the rack bar 29 is preferably pivoted to the platen carriage, a suitable spring maintaining said rack bar normally in operative position and said rack bar being adapted to be moved pivotally into disengaged position by a suitable lever.

In the preferable construction shown, the rack bar 29 is the rack bar of the escapement, which controls the feed of the platen carriage, said rack bar being pivoted to a rod 34 mounted in suitable bearings in the platen carriage, a coiled spring 35 operating to maintain said rack bar normally in operative position, which is defined by the pinion 36 of the escapement. Pivotal movement to disengage the rack bar 29 is adapted to be imparted thereto by means of a lever 37, pivoted between its ends to one of the pivot rods of the platen frame, the rear end of which is connected to the rear end of a bell lever 38, the front end of which bears upon the top of the rack bar 29 in front of the pivotal point thereof. The front end of the lever 37 projects in front of the platen at the left side thereof in convenient position to be engaged by the thumb of the left hand while said hand is holding the carriage against too rapid movement under the influence of the main carriage spring. A flat head screw 39 extends through a slot 40 in said lever and operates to guide said lever and prevents it from being bent out of shape.

The machine shown in the drawings is of the type known as a visible writing machine, the type striking the front of the platen so that the writing will always be exposed to the view of the operator. The ribbon 41 is wound upon the spools 7 and 8 and between said spools is confined in suitable guides which hold it in operative position in front of the platen at the point where the type will strike the same. In order that the ribbon may not obscure the writing, it is supported normally below the writing line and is raised each time an operating lever is depressed so as to bring said ribbon into position to be struck by the type.

In the preferable construction shown, the ribbon guides comprise guide rollers 42 revolubly mounted on the machine frame, stationary slotted guides 43 and a central ribbon bobber 44. As shown, the ribbon spools 7 and 8 are a little in front of the ribbon bobber 44 and the rollers 42 are set at a slight angle to overcome the side draft of said ribbon as it is drawn from one spool to the other.

The ribbon bobber 44 consists of a flat piece of sheet metal which is vertically movable in a suitable guide bearing on the machine frame, the ribbon 41 being confined between the rear face of said metal plate and pins 45 secured thereto, said pins 45 being

preferably secured to said metal plate at their lower ends, leaving the space between said plate and pins open at the top to provide for conveniently inserting the ribbon therein. A slot or opening 46 is formed in the upper end of the ribbon bobber to allow the type to pass said ribbon bobber and strike the platen or the ribbon which overlies the platen.

Lateral displacement of the upper end of the ribbon bobber is prevented by means of lugs 47 thereon which embrace the edges of a rigid type bar guide 48 secured to the frame of the machine. As shown, said ribbon bobber is fitted to and is longitudinally movable in a slot 49 formed in the face of a boss 50 on the machine frame to which the hanger support 51 is secured, said hanger support operating to close the open side of said slot and to confine said ribbon bobber in the bearing formed thereby.

As heretofore stated, the ribbon 41, carried by the ribbon bobber 44, is normally below the writing line, so as to expose the writing to the view of the operator, and is raised by the bobber at every depression of the operating levers to bring the ribbon between the platen and the type.

As shown, the ribbon bobber 44 is raised and lowered in the following manner:—Pivoted to a bracket 52 secured to the platen shift bar 5 is a bell lever 53, a slot 54 in one end of which engages a pin 55 secured in the lower end of the ribbon bobber. The opposite end of said bell lever 53 is connected by a link 56 with one arm of a bell lever 57 pivoted to a bracket 58 secured in fixed position on the machine frame, the other arm of which is connected with a transverse bar 59 which extends transversely beneath all of the operating levers and is secured to the ends of lever arms 60 rigidly secured to a rod 61 revolubly mounted in suitable bearings in the machine frame, the relation being such that depressing any of the operating levers will depress the bar 59, which, through the bell levers 57 and 53, will operate to raise the ribbon bobber 44 a desired distance. As shown, the bell lever 57, instead of being connected directly with the bar 59 is connected directly to the pivoted escapement frame 62, which is connected to said bar 59 by a rod 63.

In order to secure a uniform operation of the ribbon bobber 44 in both its normal and shifted positions, the relative positions of the bell levers 53 and 57 are such that the link 56 connecting them will extend at substantially the same angles on opposite sides of a line at right angles to the direction of movement of the bell lever 53, when the platen is in normal and shifted positions.

With my improved ribbon mechanism, the ribbon feed is designed to be reversed automatically, when the ribbon reaches the limit of its movement in either direction. As shown, this is effected in the following manner:—When the ribbon is placed in the machine, the ends thereof are attached to the ribbon spools 7 and 8. Assume that the pawl arm 13 is in engagement with the ratchet wheel 12 secured to the ribbon spool 7. As the machine is operated, said pawl arm will impart step by step rotation to the spool 7 in a direction to wind the ribbon thereupon and to reel it off from the spool 8. When the ribbon has been entirely unwound from the spool 8, the tension on said ribbon will prevent further rotation of the spool 7 under the influence of the pawl arm 13, and will thus prevent movement of said pawl arm 13 with the arm 14 on the rock shaft 15, which will operate to shift the pivot pin 17 in said arm 14 from the pivot bearing 20 in said pawl arm, to the pivot bearing 19, which will operate to relieve said pivot arm 13 from the tension of the spring 24, and will subject it to tension from the spring 25 on the opposite side of the pivot pin 17 at a distance therefrom, which will operate to impart pivotal movement to said pawl arm on the pivot pin 17 to disengage it from the ratchet wheel 12 secured to the ribbon spool 7 and cause it to engage the ratchet wheel secured to the spool 8, thereby reversing the ribbon feed, in the manner desired.

I claim as my invention:—

1. In a typewriting machine, the combination with the ribbon spools and ratchet wheels secured to rotate therewith, of a pawl arm, a support movable transversely of the machine on which said pawl arm is pivoted by means of a shiftable pivot bearing, means for exerting a lateral tension on said pawl arm which will become unbalanced on opposite sides of its pivotal point, as the pivot bearing of said pawl arm is shifted and means for imparting movement to said movable support transversely of the machine in both directions, substantially as described.

2. In a typewriting machine, the combination with the ribbon spools and ratchet wheels secured to rotate therewith, of a pawl arm, a support movable transversely of the machine and means to impart movement thereto in both directions, pivotal connection between said pawl arm and said movable support comprising a slot in one thereof and a pivot stud in the other which extends through said slot and means for exerting a lateral tension on said pawl arm which will become unbalanced on opposite sides of said pivot stud as said pivot stud moves lengthwise of the slot in said pawl arm, substantially as described.

3. In a typewriting machine, the combination with the ribbon spools and ratchet wheels secured to rotate therewith, of a pawl arm, a support movable transversely of the machine to which said pawl arm is pivoted

by means of a shiftable pivot bearing, a spring or springs which connect said movable support and said pawl arm, the relation being such that said spring or springs will exert an unbalanced tension on said pawl arm on opposite sides of its pivot bearing as said pivot bearing is shifted, and means to impart movement to said movable support transversely of the machine in both directions, substantially as described.

4. In a typewriting machine, the combination with the ribbon spools and ratchet wheels secured to rotate therewith, of a pawl arm, a support movable transversely of the machine and means to impart movement thereto in both directions, pivotal connection between said pawl arm and said movable support comprising a slot in one thereof and a pivot stud in the other which extends through said slot, and spring connection between said movable support and said pawl arm whereby an unbalanced tension will be exerted on said pawl arm on opposite sides of said pivot stud as the pivot bearing of said pawl arm is shifted, substantially as described.

5. In a typewriting machine, the combination with the ribbon spools and ratchet wheels secured to rotate therewith, of a pawl arm, a support movable transversely of the machine and means for imparting movement thereto in both directions, pivotal connection between said pawl arm and said movable support comprising a pivot stud in one thereof and a slot in the other through which said pivot stud extends, said slot being provided with pivot bearings located at a distance from each other and springs which connect said movable support and said pawl arm, said springs being connected to one thereof at a point between said pivot bearing and to the other at points adjacent to said pivot bearings, substantially as described.

6. In a typewriting machine, the combination with the ribbon spools and ratchet wheels secured to rotate therewith, of a pawl arm, a support movable transversely of the machine and means for imparting movement thereto in both directions, pivotal connection between said pawl arm and said movable support comprising a pivot stud in one thereof and a slot in the other through which said pivot stud extends, said slot being provided with pivot bearings located at a distance from each other and springs of substantially equal strength which connect said movable support and said pawl arm, said springs being connected to one thereof at a point in line with said pivot stud and to the other at points adjacent to the pivot bearings in said slot, substantially as described.

7. In a typewriting machine, the combination with the ribbon spools and ratchet wheels secured to rotate therewith, of a pawl arm, a support movable transversely of the machine and means for imparting movement thereto in both directions, pivotal connection between said pawl arm and said movable support comprising a pivot stud in one thereof and a slot in the other through which said pivot stud extends, said slot being provided with pivot bearings located at a distance from each other, a projection on the side of said slot between said pivot bearings and spring connection between said movable support and said pawl arm whereby an unbalanced tension will be exerted on said pawl arm, on opposite sides of said pivot stud as said pivot stud is shifted from one pivot bearing to the other, substantially as described.

8. In a typewriting machine, the combination with the ribbon spools and ratchet wheels secured to rotate therewith, of a pawl arm, a support movable transversely of the machine and means for imparting movement thereto in both directions, pivotal connection between said pawl arm and said movable support comprising a pivot stud in one thereof and a slot in the other through which said pivot stud extends, said slot being provided with pivot bearings located at a distance from each other, a projection on the side of said slot between said pivot bearings and springs of substantially equal strength which connect said movable support and said pawl arm, said springs being connected to one thereof at a point in line with said pivot stud and to the other at points adjacent to the pivot bearings in said slot, substantially as described.

9. In a typewriting machine, the combination with the ribbon spools and ratchet wheels secured to rotate therewith, of a pawl arm, a rock shaft, an arm thereon to which said pawl arm is pivoted by means of a shiftable pivot, spring connection between said pawl arm and said arm on said rock shaft whereby an unbalanced tension will be exerted on said pawl arm on opposite sides of said pivot as said pivot is shifted, and means to impart oscillatory movement to said rock shaft, substantially as described.

10. In a typewriting machine, the combination with the ribbon spools and ratchet wheels secured to rotate therewith, of a pawl arm, a support movable transversely of the machine and means for imparting movement thereto in both directions, shiftable pivotal connection between said pawl arm and said movable support and spring connection between said pawl arm and said movable support whereby an unbalanced tension will be exerted on said pawl arm on opposite sides of said pivot bearing as such pivot bearing is shifted and means to shift said pivot bearing when the ribbon reaches the limit of its movement in either direction, substantially as described.

11. In a typewriting machine, the combi-

nation with the ribbon spools and ratchet wheels secured to rotate therewith, of a pawl arm, a support movable transversely of the machine and means to impart movement thereto in both directions, shiftable pivotal connection between said pawl arm and said movable support, spring connection between said pawl arm and said movable support whereby an unbalanced tension will be exerted on said pawl arm on opposite sides of said pivot bearing as said pivot bearing is shifted and means controlled by the operation of the machine for shifting said pivot bearing when the ribbon reaches the limit of its movement in either direction, substantially as described.

12. In a typewriting machine, the combination with the ribbon spools, the ribbon wound thereon and having its ends attached thereto and ratchet wheels secured to rotate with said ribbon spools, of a pawl arm, a support movable transversely of the machine and means to impart movement thereto in both directions, shiftable pivotal connection between said pawl arm and said movable support and spring connection between said pawl arm and said movable support whereby an unbalanced tension will be exerted upon said pawl arm on opposite sides of said pivot bearing as said pivot bearing is shifted, substantially as described.

13. In a typewriting machine, the combination with the ribbon spools, the ribbon wound thereon and having its ends secured thereto and ratchet wheels secured to rotate with said ribbon spools, of a pawl arm, a rock shaft, an arm thereon to which said pawl arm is pivoted by means of a shiftable pivot, spring connection between said pawl arm and said arm on said rock shaft whereby an unbalanced tension will be exerted on said pawl arm on opposite sides of said pivot bearing as said pivot bearing is shifted and means to impart oscillatory movement to said rock shaft, substantially as described.

14. In a typewriting machine, the combination with the ribbon spools, the ribbon wound thereon and having its ends attached thereto and ratchet wheels secured to rotate with said ribbon spools, of a pawl arm, a rock shaft, an arm thereon, pivotal connection between said pawl arm and said arm on said rock shaft comprising a pivot stud in one thereof and a slot in the other through which said pivot stud extends, said slot being provided with pivot bearings located at a distance from each other, spring connection between said pawl and said rock arm whereby an unbalanced tension will be exerted on said pawl arm on opposite sides of said pivot stud as said pivot stud is shifted from one pivot bearing to the other and means to impart oscillatory movement to said rock shaft, substantially as described.

15. In a typewriting machine, the combination with the ribbon spools and ratchet wheels secured to rotate therewith, of a pawl arm, a rock shaft, an arm on said rock shaft, a shiftable pivotal connection between said pawl arm and said arm on said rock shaft, spring connection between said pawl arm and said arm on said rock shaft whereby an unbalanced tension will be exerted on said pawl arm on opposite sides of its pivot bearing as said pivot bearing is shifted, and means to impart oscillatory movement to said rock shaft, said means comprising a lever arm secured thereto, a rack on the platen carriage with which said lever arm engages whereby movement of said carriage will rotate said rock shaft in one direction and a spring applied to said lever arm to rotate said rock shaft in the opposite direction, substantially as described.

16. In a typewriting machine, the combination with ribbon spools and ratchet wheels secured to rotate therewith, of a pawl arm, a rock shaft, an arm on said rock shaft, shiftable pivotal connection between said pawl arm and said arm on said rock shaft, spring connection between said pawl arm and said arm on said rock shaft whereby an unbalanced tension will be exerted on said pawl arm on opposite sides of its pivot bearing as said pivot bearing is shifted, and means to impart oscillatory movement to said rock shaft, said means comprising a lever arm secured thereto, a rack on the platen carriage with which said lever arm engages, whereby movement of said carriage will rotate said rock shaft in one direction, a spring applied to said lever arm to rotate the same in the opposite direction, and a spring pawl, pivoted to the end of said lever arm to permit retraction of the platen carriage, substantially as described.

17. In a typewriting machine, the combination with the ribbon spools and ratchet wheels secured to rotate therewith, of a pawl arm, a rock shaft, an arm on said rock shaft, a shiftable pivotal connection between said pawl arm and said arm on said rock shaft, spring connection between said pawl arm and said arm on said rock shaft whereby an unbalanced tension will be exerted on said pawl arm on opposite sides of its pivot bearing as said pivot bearing is shifted, and means to impart oscillatory movement to said rock shaft, said means comprising a rack bar pivoted upon the platen carriage, teeth thereon with which said lever arm engages, whereby movement of said carriage will rotate said rock shaft in one direction, a spring applied to said lever arm to rotate said rock shaft in the opposite direction, and means to move said rack bar pivotally to disengage the teeth thereon from said lever arm, substantially as described.

18. In a typewriting machine, the combination with the ribbon spools and ratchet

wheels secured to rotate therewith, of a pawl arm, a rock shaft, an arm on said rock shaft, a shiftable pivotal connection between said pawl arm and said arm on said rock shaft, spring connection between said pawl arm and said arm on said rock shaft whereby an unbalanced tension will be exerted on said pawl arm on opposite sides of its pivot bearing as said pivot bearing is shifted, and means to impart oscillatory movement to said rock shaft, said means comprising a lever arm secured thereto, a spring pawl pivoted to the end thereof, a rack bar pivoted upon the platen carrriage, teeth thereon with which said spring pawl engages, whereby movement of said carriage will rotate said rock shaft in one direction, a spring applied to said lever arm to rotate said shaft in the opposite direction, and means to move said rack bar pivotally to disengage the teeth thereon from said lever arm, substantially as described.

19. In a typewriting machine, the combination with the ribbon spools and ratchet wheels secured to rotate therewith, of a pawl arm, a rock shaft, an arm on said rock shaft, pivotal connection between said pawl-arm and said arm on said rock shaft comprising a pivot stud in one thereof and a slot in the other through which said pivot stud extends, said slot being provided with pivot bearings located at a distance from each other, spring connection between said pawl arm and said arm on said rock shaft whereby an unbalanced tension will be exerted upon said pawl arm on opposite sides of said pivot stud as said pivot stud is shifted from one pivot bearing to the other, and means to impart oscillatory movement to said rock shaft, said means comprising a lever arm secured thereto, a spring pawl pivoted to the end of said lever arm, a rack bar pivoted upon the platen carriage, teeth thereon with which the pawl on said lever arm engages, whereby movement of said carriage will rotate said rock shaft in one direction, a spring applied to said lever arm to rotate the same in the opposite direction and means to move said rack bar pivotally to disengage the teeth thereon from said pawl on said lever arm, substantially as described.

20. In a typewriting machine, the combination with the ribbon spools, the ribbon wound thereon and having its ends attached thereto and ratchet wheels secured to rotate therewith, of a pawl arm, a rock shaft, an arm on said rock shaft, pivotal connection between said pawl arm and said arm on said rock shaft comprising a pivot stud in one thereof and a slot in the other provided with pivot bearings located at a distance from each other, spring connection between said pawl arm and said arm on said rock shaft whereby an unbalanced tension will be exerted on said pawl arm on opposite sides of said pivot stud as said pivot stud is shifted from one pivot bearing to the other, and means to impart oscillatory movement to said rock shaft, said means comprising a lever arm secured thereto, a spring pawl pivoted to said lever arm, a rack bar pivoted to the platen carriage, teeth thereon with which said pawl on said lever arm engages, whereby movement of said carriage will rotate said rock shaft in one direction, a spring applied to said lever arm to rotate said rock shaft in the opposite direction, and means to move said rack bar pivotally to disengage the teeth thereon from said lever arm, substantially as described.

In testimony, that I claim the foregoing as my invention, I affix my signature in presence of two subscribing witnesses, this 26th day of May, A. D. 1904.

JAMES W. KENNEDY.

Witnesses:

K. A. COSTELLO,

B. MOLTER.