

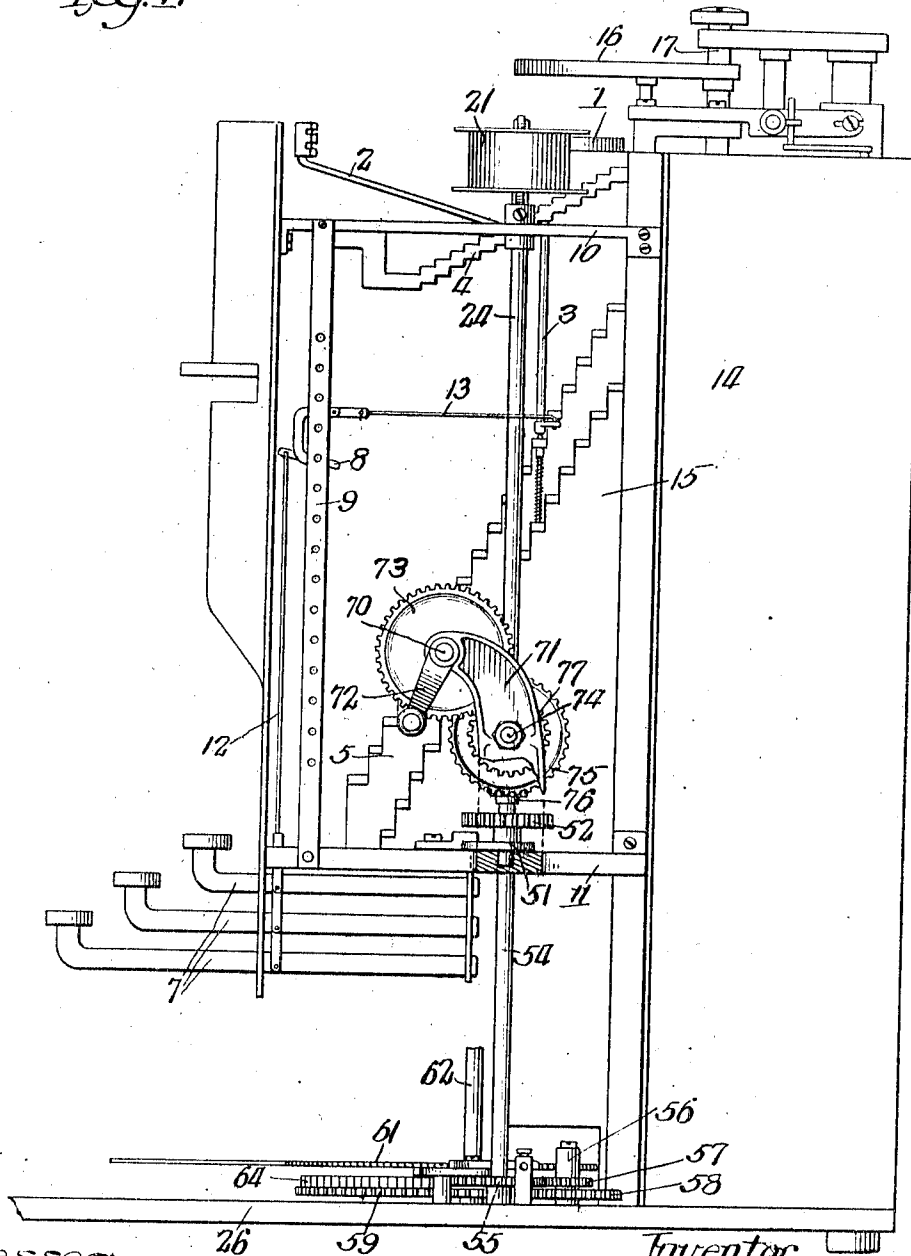
C. S. NICKERSON.
 RIBBON MECHANISM FOR TYPE WRITING MACHINES.
 APPLICATION FILED SEPT. 28, 1908. RENEWED NOV. 13, 1911.

1,012,094.

Patented Dec. 19, 1911.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
 J. H. Alfede
 G. R. Wilkins

Inventor:
 Charles S. Nickerson
 by Poole & Brown, Attys

C. S. NICKERSON.

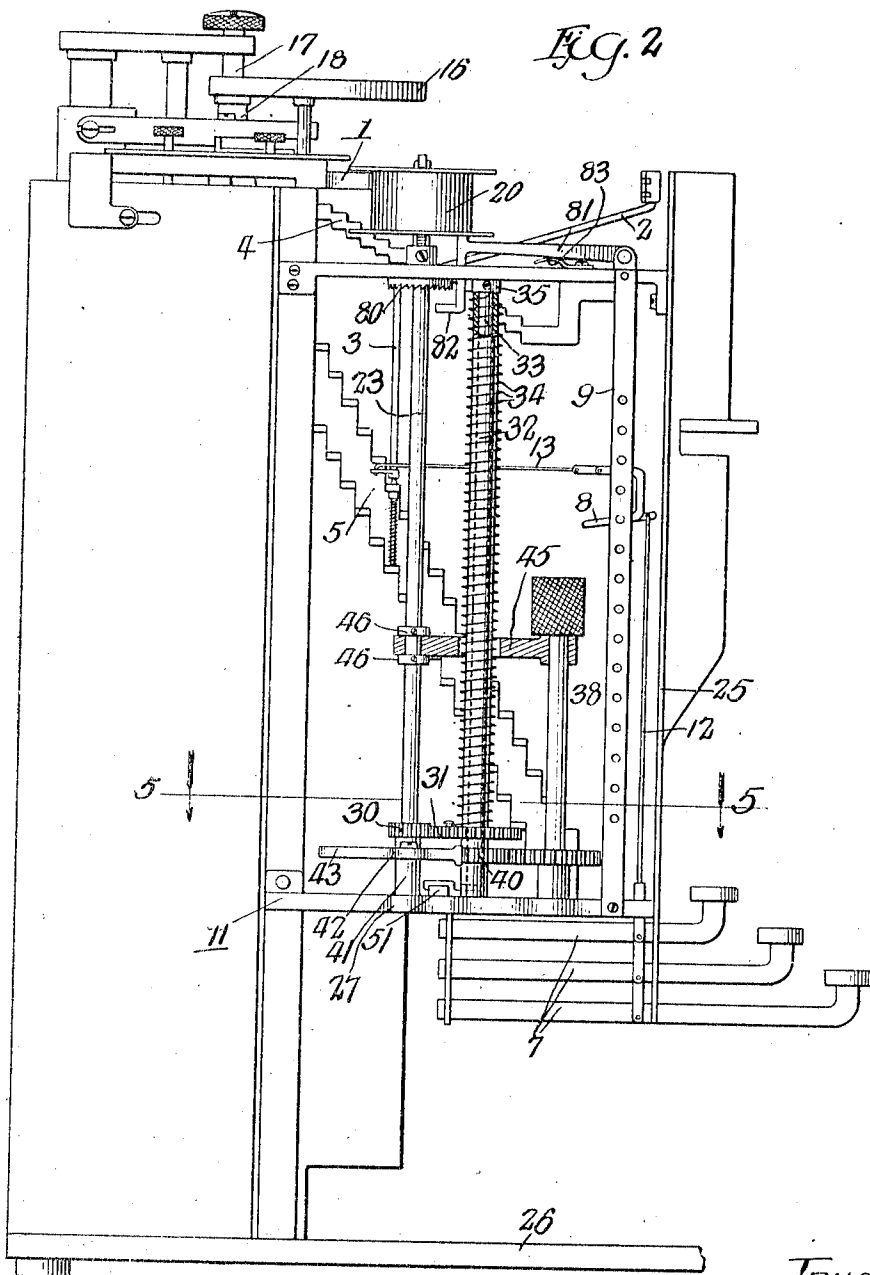
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4 SHEETS—SHEET 2.



Witnesses:
P. H. Alfede
L. R. Wilkins

Inventor
Charles S. Nickerson
by Poole & Brown
Atty's

C. S. NICKERSON.

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4 SHEETS—SHEET 3.

Fig. 3.

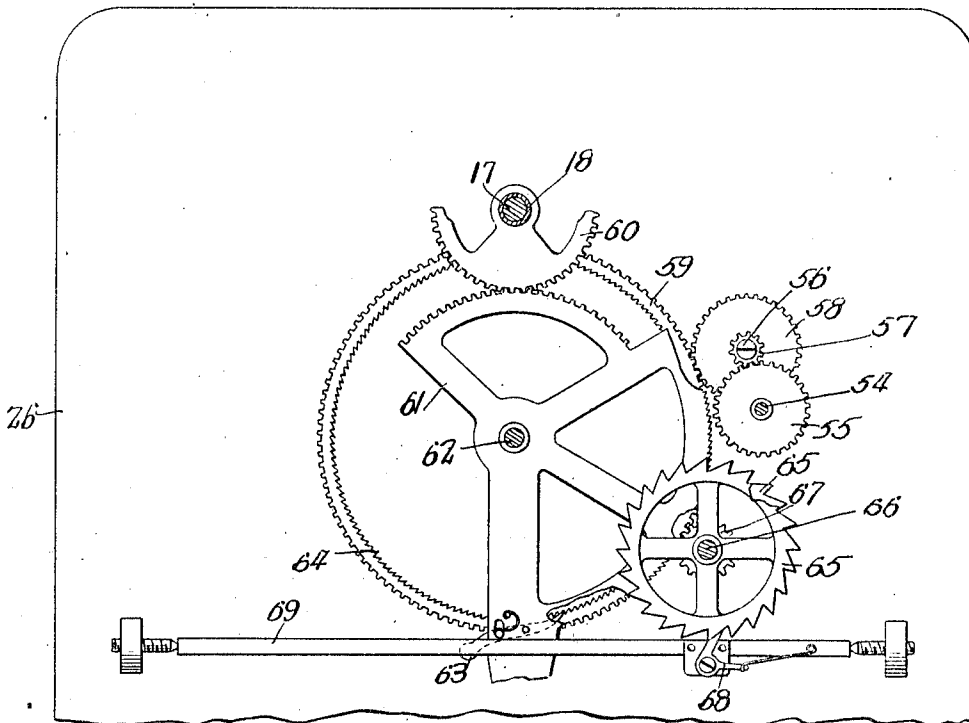
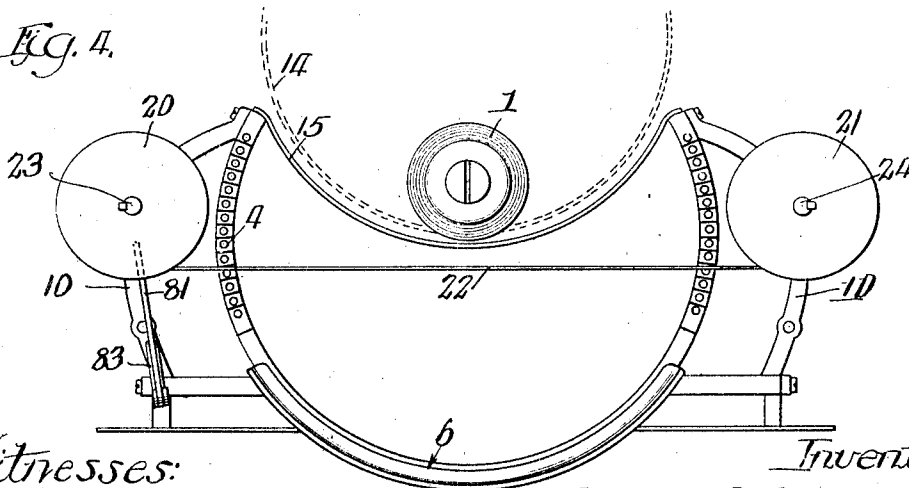


Fig. 4.



Witnesses:
J. A. Alfreds
G. R. Wilkins

Inventor:
Charles S. Nickerson
by Poole & Brown
Attys

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4 SHEETS-SHEET 4.

Fig. 5.

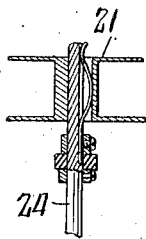
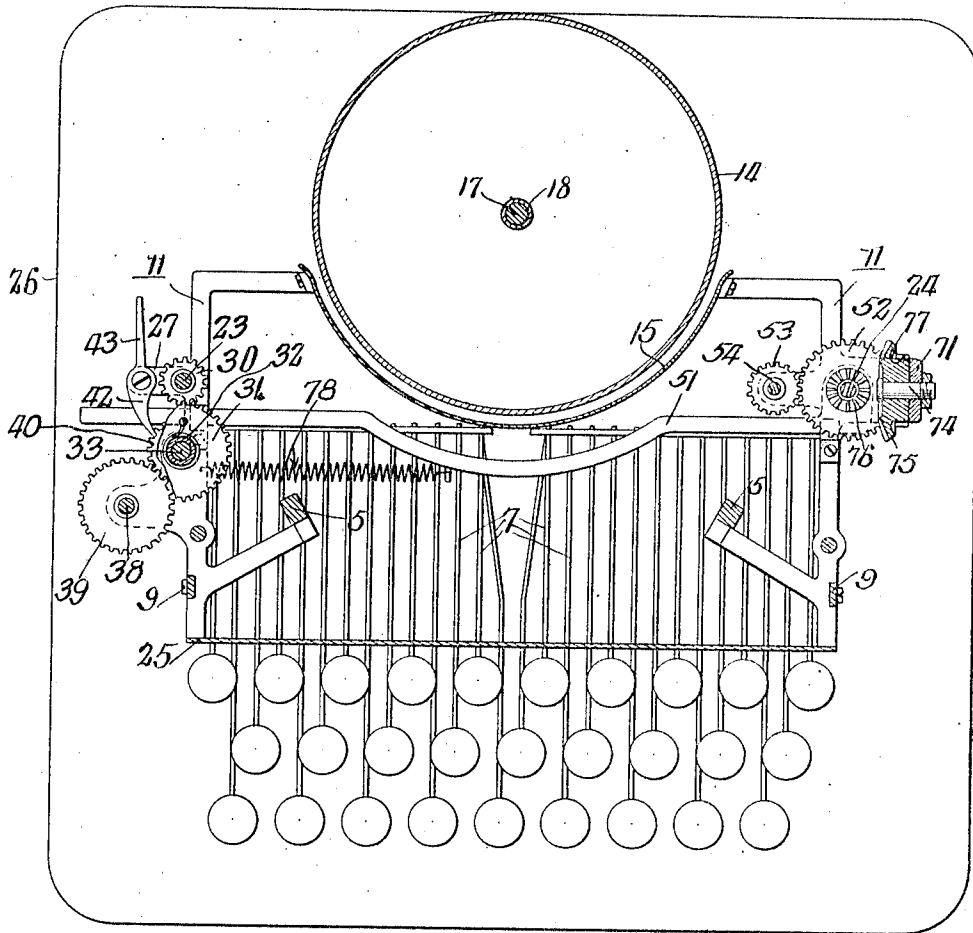


Fig. 6.

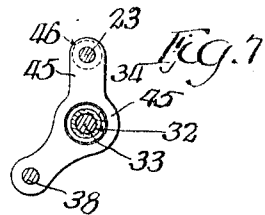


Fig. 7.

Witnesses:
 J. H. Alfude
 L. R. Wilkins

Inventor:
 Charles S. Nickerson
 by Poole & Brown Attys

UNITED STATES PATENT OFFICE.

CHARLES S. NICKERSON, OF CHICAGO, ILLINOIS.

RIBBON MECHANISM FOR TYPE-WRITING MACHINES.

1,012,094.

Specification of Letters Patent.

Patented Dec. 19, 1911.

Application filed September 28, 1908, Serial No. 455,147. Renewed November 13, 1911. Serial No. 660,163.

To all whom it may concern:

Be it known that I, CHARLES S. NICKERSON, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Ribbon Mechanism for Type-Writing Machines: and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to ribbon mechanism for typewriters and embraces improvements in means for giving movement to the ribbon and for maintaining the ribbon under tension and at a distance from the paper when at rest in order that the writing upon the paper will be visible to the operator and to other details of construction in such mechanism.

The invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims.

A ribbon mechanism embracing my invention may be applied to typewriting machines of various forms. In the accompanying drawings such ribbon mechanism is illustrated in connection with a form of typewriting machine such as is set forth in a separate application filed by me on the 7th day of May 1906, Serial Number 315,638. No reference is made herein to parts not necessary to an understanding of the ribbon mechanism.

In the said drawings:—Figure 1 is an elevation of the main parts of the machine as viewed from the right. Fig. 2 is an elevation of the parts of the machine as viewed from the left. Fig. 3 is a plan view of a portion of the base-plate of the machine, showing the driving gears and their connections, Fig. 4 is a plan view showing the type bar, ribbon, ribbon spools and platen. Fig. 5 is a view taken upon line 5-5 of Fig. 2, showing in detail the gears of the ribbon mechanism. Fig. 6 is a detail sectional view of one of the ribbon spools showing the means for connecting the same with its supporting shaft. Fig. 7 is a face view of a bracket arm used for supporting parts of the mechanism.

As shown in the drawings, 1 indicates the platen of the machine which constitutes the support against which the paper rests in

the operation of printing, and 2, 2 indicate type bars which are arranged in two groups at opposite sides of the printing or impression point of the platen and with their pivotal axes arranged vertically. Said type bars are attached to upright pivot rods 3, 3 which are mounted in upper and lower segmental frame members 4 and 5 located at opposite sides of the machine.

6 designates a curved or segmental rest for the type heads against which the same bear when in their retracted positions.

The type bars are operated from the key levers 7, 7 of the machine by means of horizontal rock shafts 8 pivotally supported in vertical supporting members 9, 9 which are secured at their upper and lower ends to upper and lower horizontal frame members 10 and 11 which extend from front to rear of the machine at both sides of the same. The rigid arms of the rock-shafts are connected with the key-levers by means of upright rods 12 and by means of horizontal rods 13 with the rigid arms on the pivot rods 3.

The platen illustrated constitutes part of the paper supporting, and actuating device shown in my application for patent hereinbefore referred to. Said platen consists of a wheel or disk arranged horizontally, and turning on a vertical axis, said wheel or disk having a narrow marginal or working face wide enough only to receive the impression of one of the types on the type-heads. The platen thus constructed is given vertical movement by a platen shift device which also gives vertical movement to the paper and which is so constructed that both the platen and paper have a rising and falling movement by which the narrow face of the platen is brought into position for contact therewith of one or the other vertically spaced types with which each of the several type heads is provided. In the paper supporting and actuating device shown in the drawings, moreover, the sheet of paper is held or confined between two stationary, parallel guide plates 14 and 15, the plate 14 having the form of a segment of an upright cylinder and the guide plate 15 being cylindric in shape and located at the front of and concentric to the guide plate 14, in such a manner that the paper is caused to move in a curved path between the concave face of the plate 14 and the adjacent convex face of the plate 15. The paper sup-

porting and actuating devices illustrated also include an oscillating and vertically movable paper supporting and actuating segment 16 which swings upon a vertical axis and to the curved margin of which the upper edge of the paper is fastened. Said segment 16 is attached to the upper end of a vertically movable upright shaft 18; the said shaft 18 being located concentrically within the cylinder 14 and adapted to be turned step-by-step for letter spacing through the medium of an actuating spring controlled by an escapement mechanism.

The drawings illustrate parts of the device shown in the application above referred to for giving vertical and oscillatory movement to the paper supporting segment 16 and for vertically shifting the platen 1 as required for printing from either one of the types on the type-heads, and also for giving line space movement to the segment 16 and the sheet held thereby, but inasmuch as these parts are fully described and illustrated in the said prior application and constitute no part of this invention they need not be more fully herein described.

The ribbon spools indicated by 20 and 21 are located at opposite sides of the paper guide plate 14 and are mounted on the upper ends of upright, rotative spool shafts 23 and 24. The spool 20 which is located at the left hand side of the machine is rotated by the turning of its shaft 23 to effect the winding thereon of the ribbon 22 as it is fed across the face of the platen and the turning of the spool 21, at the right hand side of the machine, in the unwinding of the ribbon therefrom is controlled by a geared connection of its shaft 24 with the letter-spacing devices of the machine, as herein-after described. The spool shafts 23 and 24 are supported at their ends in bearings carried by upper and lower horizontal frame members 10 and 11 extending from front to rear of the machine at each side of the same. Said frame members are attached at their forward ends to a front frame plate 25 and at their rear ends to the guide plate 15 which is attached to and rises from the base plate 26 of the machine.

In order to feed or move the ribbon 22 past the printing point and to maintain the same under tension, means are provided for turning or rotating the left hand spool shaft 23 as follows: Said shaft 23 has bearing at its upper end in the adjacent upper frame member 10 and at its lower end in a laterally projecting lug 27 on the lower frame member 11. Secured to said shaft 23 near the lower end thereof is a gear wheel 30 which is adapted to mesh with a gear wheel 31 carried upon a tubular upright shaft 32 which is rotatively mounted upon a tension shaft 33; said shaft 33 being journaled at its upper and lower ends in the frame members

10 and 11. Surrounding the tubular shaft 32 and attached at its lower end to the gear wheel 31 upon the said shaft is a helical spring 34. At its upper end the said spring is secured to a collar 35 which is attached to the upper end of the tension shaft 33 below the frame member 11. Said tension shaft 33 is adapted to be adjustably turned to vary the tension of the said spring, which acts through the gear wheel 31 upon the tubular shaft 32 and the gear wheel 30 to turn said spool shaft 23 in a direction to wind the ribbon upon the spool 20. The tension of the helical spring 34 is adjusted by means of a vertically arranged short adjusting shaft 38 which is journaled at its lower end in the horizontal frame member 11, and is provided at its upper end with a knurled knob or head. The said shaft is provided at its lower end with a gear wheel 39 which meshes with a gear wheel 40 carried upon the said tension shaft 33 near the lower end thereof and by means of which the said tension shaft may be rotated to increase or decrease the tension of the helical spring 34. Pivotally supported upon a bracket arm 41 upon the horizontal frame member 11 and engaging the teeth of the gear wheel 40 upon the tension shaft 33 is a holding pawl 42 which is adapted to lock the said shaft 33 from turning and to thereby retain the spring under tension. The said pawl 42 is extended to provide a finger lever 43 by means of which the pawl may be disengaged from the gear wheel 34 for the purpose of permitting the shaft 33 to rotate to decrease the tension in the spring 34 when desired. The upper end of the shaft 38 is journaled in a bracket arm 45 (Fig. 7) which is enlarged near its central portion to surround the spring 34 and is supported by means of two collars 46, 46 secured to the shaft 23.

The right hand spool shaft 24, carrying the spool 21 from which the ribbon 22 is unwound or fed to the spool 20, is journaled at its upper end in the upper right hand horizontal frame member 10. At its lower end the said shaft is journaled in a horizontally arranged sliding bar 51 (Fig. 5) adapted to afford lateral adjustment of the said lower end of said shaft. Said bar 51 extends across the machine in front of the guide-plate 15 and is supported at its ends on the lower frame members 11 by bearings adapted to permit endwise sliding movement of said bar. Attached to the shaft 24, near the lower end thereof, is a gear wheel 52 which normally meshes with a gear wheel 53 carried upon the upper end of a vertically arranged connecting shaft 54, the upper end of which is mounted in a bearing attached to the horizontal frame member 11. At its lower end the said shaft 54 is mounted in a bearing upon the horizontal base plate

26 of the machine and is provided with a gear wheel 55. The said gear wheel 55 is adapted to mesh with a gear pinion 57 carried upon an upright stub-shaft 56 which is attached to and rises from the horizontal base plate 27 of the machine. A larger gear wheel 58 is secured to the gear pinion 57 and is adapted to mesh with a gear wheel 59 constituting a part of the letter-spacing mechanism of the machine and by means of which the shaft 56 is rotated step-by-step to permit the unwinding of the ribbon from the spool 21. The mechanism for actuating said gear wheel 59 is located adjacent to the base plate of the machine and is associated with the escape-mechanism by which the turning of the segment 16, the shaft 17 and the shaft 18, for letter-spacing is controlled. The actuating spring through which letter-spacing movement is given to the paper operates on the shaft 18, to which is attached an oscillating segment 60. Said gear segment 60 meshes with a gear segment 61 attached to an upright shaft 62 arranged forward of the shaft 18. The gear wheel 59 is mounted just above the base plate 27 concentrically with the shaft 62. Said gear-segment is provided with a forwardly projecting arm which carries a pawl 63. Said pawl, in the oscillatory movement of the gear segment, acts on a ratchet wheel 64 mounted concentrically with the shaft 62 and attached to the gear wheel 59 above the latter. The turning of the shaft 18 under the action of the actuating spring is controlled by escape wheels 65, 65 (only one of which is shown) mounted upon an upright shaft 66 provided with a gear pinion 67 which intermeshes with the gear wheel 59. The said escape wheels are engaged by pawls (one of which is shown at 68 Fig. 3) which are carried by a rock-shaft 69 controlled by the key levers of the machine.

The foregoing mechanism is substantially the same as that which is fully illustrated and described in my application hereinbefore referred to and need not be herein more fully described, except to state that the ratchet wheel 64 and the gear wheel 59 are turned or carried with the gear segment 61 in the advance or letter-spacing movement of said gear segment, but have no movement in the return or backward movement of the said segment. As the gear wheel 59 rotates step-by-step to give letter-spacing movement to the paper it will rotate the gear wheel 58 which will operate through the gear wheels 57 and 55 to rotate the connecting shaft 54 which in turn operates through the gear wheels 53 and 52 to rotate the spool shaft 24 and the spool 21 carried thereon, thus causing said spool to rotate in a direction to permit the ribbon to unwind therefrom, the ribbon delivered from the spool 21 being taken up and held in tension by

the action of the helical spring 34 upon the shaft 23 carrying the spool 20.

For rewinding the ribbon 22 upon the spool 21 there is provided a horizontal crank shaft 70 (Fig. 1) which is rotatively mounted in a bracket arm 71 secured to the right hand horizontal frame member 11 adjacent to the shaft 24, and is provided at its outer end with a crank 72. The said crank shaft 70 is provided on its inner end with a gear wheel 73. Said gear wheel is adapted to mesh with a gear wheel 77 carried upon a horizontal stub-shaft 74 mounted upon the bracket 71 between the ends thereof. Upon the said shaft 74 is a bevel gear wheel 75 which is adjacent to but normally out of engagement with a bevel gear 76 carried upon the shaft 24 above the gear wheel 52 thereon. The said bevel gears 75 and 76 are adapted to be shifted into engagement with each other by endwise movement of the sliding bar 51 upon which the lower end of the shaft 24 is supported. By shifting said bar 51 endwise the lower end of the shaft 24 may be moved laterally to bring the gears 52 and 76 on said shaft into and out of mesh with the gears 53 and 75. A coiled tensional spring 78, which is attached at one end to the horizontal frame member 11 adjacent to the shaft 23 and at its other end to the sliding bar 51, acts to hold said bar normally in position to maintain the gears 52 and 53 in mesh with each other. The rewinding of the ribbon upon the spool 21 rotates the shaft 23 in a direction to put the helical spring 34 under tension.

For detachably securing the ribbon spools 20 and 21 to the spool shafts 23 and 24, each spool is provided with a central aperture to receive the upper end of the shaft, and the shaft is provided with a leaf spring secured at its lower end to the shaft and bent outwardly between its ends to engage a slot formed in the central aperture of the spool. The spring thus arranged holds the spool from turning on the shaft and by its frictional engagement with the spool retains the latter upon the shaft.

In order to retain the helical spring 34 under tension when the spool is removed from the shaft 23, the said shaft is provided with a downwardly facing crown ratchet 80 (Fig. 2) which is rigidly secured thereto and located below the left hand horizontal frame member 10. Pivotaly supported upon the said horizontal frame member 10 is a horizontally arranged detent arm 81, the swinging end of which is adapted to bear upwardly against the lower surface of the spool 20 and is provided with a depending arm, the lower end of which is provided with a pawl or detent 82 (Fig. 2) which extends beneath and is adapted to engage the crown ratchet 80. A leaf spring 83 secured to the horizontal frame member

10 and bearing upwardly against the lever 81 acts to press the said lever upwardly to bring the pawl 82 into engagement with the teeth of the crown ratchet 80 when the spool 20 is removed from its shaft. When the
 5 spool is applied to the shaft, the lever 81 is depressed and its pawl 82 held below and free from the crown ratchet, leaving the spool shaft free to rotate under the action of the helical spring 34.

10 I claim as my invention:—

1. The combination with a spring actuated part through the medium of which letter-space movement is given to the paper, and an escape mechanism by which step-by-
 15 step movement is given to said spring actuated part for letter-spacing, of two ribbon spools, a spring acting on one of said spools to rotate the same for winding the ribbon thereon, and an operative connection between the other spool and said spring-actuated part acting to permit step-by-step rotation of the same under the tension of the ribbon to correspond with the step-by-step
 20 movement of said spring-actuated part.

2. A ribbon mechanism for typewriting machines, comprising two ribbon spools, rotative shafts on which said spools are mounted, a spring acting on one of said
 30 shafts to give rotative movement to the same, a gear wheel which has rotative movement in one direction to correspond with the letter-spacing movement of the machine, and gearing connecting said gear wheel with the other of said spool shafts.

3. In a ribbon mechanism for typewriting machines, embracing two ribbon spools, spool shafts upon which said ribbon spools are mounted, a coiled spring acting on one
 40 of said shafts to give rotative movement to the same, tension controlling means between one end of said spring and the machine frame for adjusting the tension of said spring, and means connecting the other
 45 spool shaft with one of the moving parts of the machine to control the rotation of the last named spool shaft.

4. A ribbon mechanism for typewriting machines, comprising two ribbon spools, two
 50 rotative spool shafts on which the same are mounted, a tension shaft arranged parallel with one of said spool shafts, a sleeve mounted on said tension shaft, a coiled spring surrounding said sleeve, said spring
 55 being attached at one end to said tension shaft and at its other end to said sleeve, intermeshing gear wheels on the said sleeve and the adjacent spool shaft, and means for controlling the rotation of the other spool
 60 shaft.

5. A ribbon mechanism for typewriting machines, comprising a ribbon spool, a rotative shaft on which the same is mounted, a tension shaft arranged parallel with one
 65 of said spool shafts, a sleeve mounted on

said tension shaft, a helical spring surrounding said sleeve, said spring being attached at one end to said tension shaft and at its other end to said sleeve, intermeshing gear wheels on the said sleeve and the spool
 70 shaft, and means for effecting rotative adjustment of said tension-shaft to vary the tension of the said spring.

6. A ribbon mechanism for typewriting machines comprising a ribbon spool, a spool
 75 shaft on which the same is mounted, a tension-shaft parallel with said spool shaft, a sleeve mounted to turn on said tension-shaft, a helical spring surrounding said sleeve, said spring being attached at one end
 80 to said tension-shaft and at the other end to said sleeve, intermeshing gear wheels on said sleeve and on the spool shaft, intermeshing gear wheels on the tension-shaft and spool shaft, and means for locking the
 85 tension shaft in its adjusted position.

7. A ribbon mechanism for typewriting machines comprising two ribbon spools, two
 90 spool shafts on which the same are supported, a spring acting on one of said shafts to give rotative movement to the same, a gear wheel having step-by-step rotative movement controlled by the letter-spacing mechanism of the machine, gearing connecting
 95 said gear wheel with the other spool shaft, embracing means for disconnecting said gearing therefrom, and a crank shaft having detachable geared connection with said last named spool shaft, whereby the
 100 latter may be turned for winding back the ribbon.

8. A ribbon mechanism for typewriting machines, comprising two ribbon spools, two upright spool shafts, in the upper end of
 105 which said spools are mounted, a spring acting on one of said spool shafts to give rotative motion to the same, a gear wheel having step-by-step rotative movement controlled by the letter-spacing mechanism of the machine, a horizontally sliding bar in
 110 which the lower end of the other spool shaft is mounted, and a gear-wheel on said last named spool shaft adapted to be thrown into and out of mesh with said first named gear wheel by the shifting of the lower end
 115 of the said spool shaft.

9. A ribbon mechanism for typewriting machines comprising two ribbon spools, two upright spool shafts, on the upper ends of
 120 which said spools are mounted, a spring acting on one of said spool shafts to give rotative motion to the same, a gear-wheel on the machine frame having step-by-step rotative movement controlled by the letter-spacing mechanism of the machine, a horizontally
 125 sliding bar in which the lower end of the other spool shaft is mounted, a gear-wheel on said last named spool shaft adapted to be thrown into and out of mesh with said gear wheel on the machine frame by
 130

the shifting of the lower end of the said spool shaft, a crank-shaft on the machine frame, and gearing for connecting said crank-shaft with the last named spool shaft, embracing gear wheels which are thrown into and out of mesh with each other by the shifting of the lower end of the spool shaft.

10. A ribbon mechanism for typewriting machines, comprising two ribbon spools, two spool shafts upon which the same are mounted, a spring acting on one of said shafts to give rotative movement to the same, a gear-wheel on the machine frame having step-by-step rotative movement controlled by the letter-spacing mechanism of the machine, a horizontal sliding bar in which the lower end of the other spool is mounted, a gear wheel mounted on the lower end of the last named spool shaft and adapted to intermesh with said gear wheel on the machine frame, intermeshing bevel-gears, one mounted on said last named spool shaft and the other on the machine frame, a crank shaft having geared connection with said bevel wheel on the frame, said last named spool shaft being adapted to be moved by the shifting of said sliding bar to bring the gear wheels on the machine frame and spool shaft into and out of mesh with each other.

11. A ribbon mechanism for typewriting machines comprising two ribbon spools, two upright spool shafts on which the same are mounted, a spring acting on one of said spool shafts to give rotative movement to the same, a horizontally arranged gear wheel on the machine frame having step-by-step rotative movement controlled by the letter-spacing mechanism of the machine, an upright connecting shaft mounted in the machine frame, a gear pinion on the lower end of said upright shaft, intermeshing with said horizontally arranged gear-wheel, intermeshing gear wheels on the lower end of the other spool shaft and the upper end of said connecting shaft, and a horizontally sliding bar in which the lower end of the last named spool shaft has bearing and which is adapted to be shifted to bring the

gear-wheels on the connecting shaft and spool shaft into and out of mesh with each other.

12. A ribbon mechanism for typewriting machines comprising two ribbon spools, two upright spool shafts on which the same are mounted, a spring acting on one of said spool shafts to give rotative movement to the same, a horizontally arranged gear-wheel on the machine frame having step-by-step rotative movement controlled by the letter-spacing mechanism of the machine, an upright connecting shaft mounted in the machine frame, a gear pinion on the lower end of said upright shaft, intermeshing with said horizontally arranged gear wheel, intermeshing gear wheels on the lower end of the other spool shaft and the upper end of said connecting shaft, a horizontally sliding bar in which the lower end of the last named spool shaft has bearing and which is adapted to be shifted to bring the gear wheels on the connecting shaft and spool shaft into and out of mesh with each other, and a spring acting on said sliding bar to hold the last named gear wheels normally in mesh with each other.

13. A ribbon mechanism for typewriting machines, comprising a ribbon spool, a rotative shaft on which said spool is detachably mounted, a spring acting on said shaft to give rotative motion to the same, a ratchet wheel on said shaft, and a spring actuated detent on the machine frame, adapted for engagement with said ratchet wheel when the ribbon spool is removed from said shaft and to be held away from the ratchet wheel by the pressure of the spool when the latter is in place on the shaft.

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 23d day of September A. D. 1908.

CHARLES S. NICKERSON.

Witnesses:

C. CLARENCE POOLE,
GEORGE R. WILKINS.