

No. 882,829.

PATENTED MAR. 24, 1908.

W. P. KIDDER.

RIBBON REVERSING MECHANISM FOR TYPE WRITING MACHINES.

APPLICATION FILED SEPT. 11, 1905.

2 SHEETS—SHEET 1.

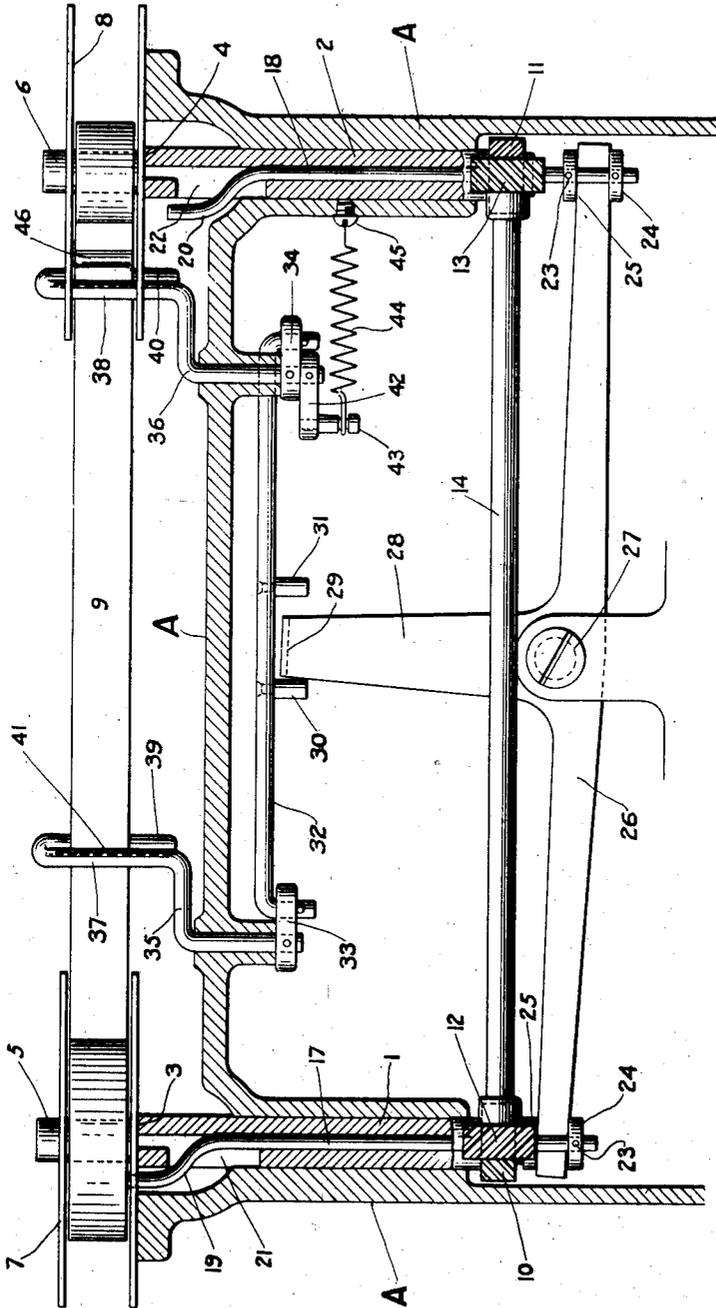


Fig. 1.

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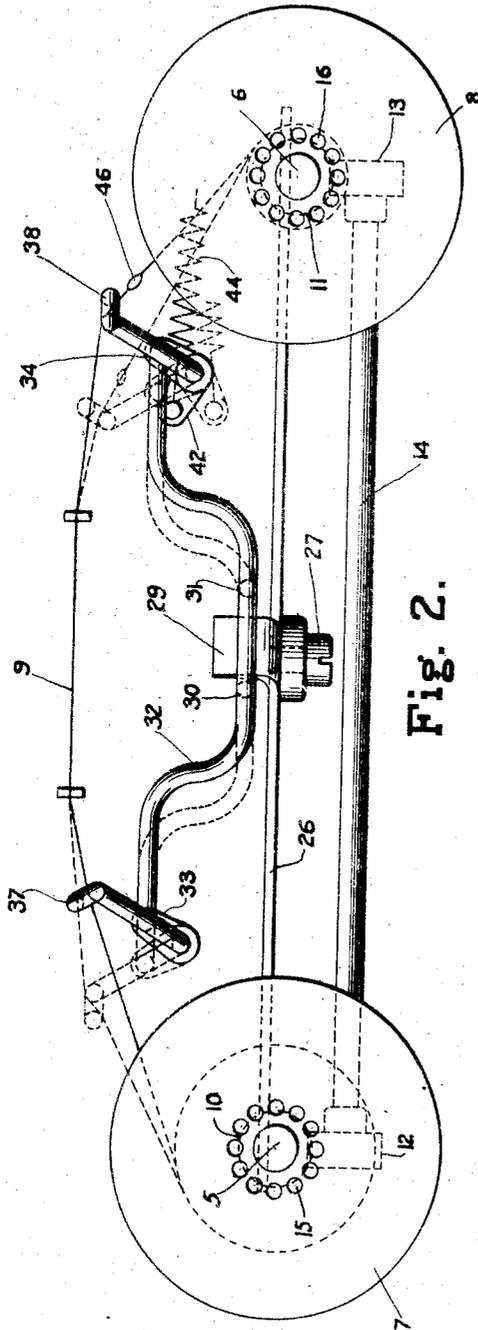


Fig. 2.

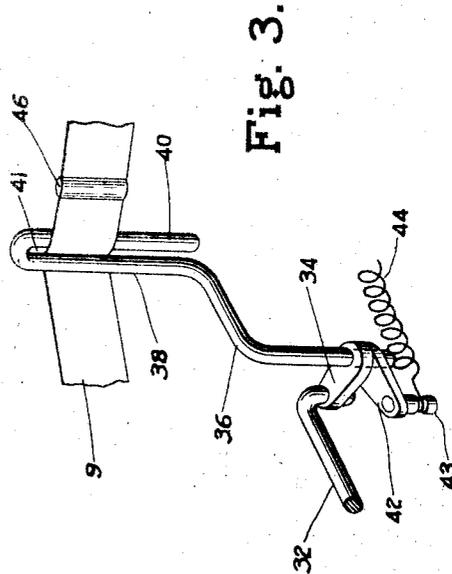


Fig. 3.

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# UNITED STATES PATENT OFFICE.

WELLINGTON P. KIDDER, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO PARKER MACHINE COMPANY, OF BUFFALO, NEW YORK, A CORPORATION OF NEW YORK.

## RIBBON-REVERSING MECHANISM FOR TYPE-WRITING MACHINES.

No. 882,829.

Specification of Letters Patent.

Patented March 24, 1908.

Application filed September 11, 1905. Serial No. 277,911.

*To all whom it may concern:*

Be it known that I, WELLINGTON P. KIDDER, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Ribbon-Reversing Mechanism for Type-Writing Machines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to typewriting machines and has for one of its objects to provide means for changing automatically the direction of feed of the inking ribbon.

Another object is to provide reversing mechanism adapted initially to be operated by the tension of the inking ribbon, when the end of said ribbon is reached, such that a certain and effective action is secured, coupled with a minimum of strain upon the ribbon.

Another object is the provision of ribbon feeding and reversing mechanism in a machine of the above type of such construction as to operate substantially without noise.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the mechanism hereinafter to be described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, wherein is illustrated one of the various possible embodiments of my invention: Figure 1 is an elevation of the same. Fig. 2 is a top plan view of the same. Fig. 3 is a view in perspective of a detail of construction.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Preliminary to a description of the specific features of my invention and in order to render clearer of understanding certain of the objects thereof, it may at this point be noted that, in ribbon feed reversing devices which operate automatically, it is essential to so construct the mechanism that the reversal may be accomplished in a very short period of time after the playing out of the ribbon from either of the supply spools; otherwise, there must necessarily be a period of rest for

the ribbon, during which several printing characters will strike upon the same spot 55 and in a short time perforate or otherwise render the ribbon useless. The inking ribbon being of a fragile nature, it is, moreover, essential that the reversal of feed be accomplished without putting an undue strain upon 60 said ribbon. To remove the above objections and accomplish these and other advantageous results, I have found it desirable to provide mechanism adapted automatically to effect the reversal of the longitudinal feed 65 of the inking ribbon of such construction that a very slight tension upon the ribbon will operate the reversing mechanism, the feed of the ribbon being in no wise retarded or hindered while the actual reversal takes 70 place, when the direction of the longitudinal movement is instantly changed.

One of the objects of my invention being to secure a noiseless feeding and reversing mechanism, I have, therefore, found it desirable to provide mechanism of such character as to eliminate concussion or impact of moving parts, insuring thereby a substantially silent operation.

The above and other advantages are secured in constructions of the nature of that hereinafter described.

Referring now to the drawings, A designates a portion of the frame of a typewriting machine designed to carry the ribbon spools 85 and ribbon reversing mechanism.

Journaled in vertical openings at either end of frame A are hollow driving shafts 1 and 2, provided near their upper ends with shoulders 3 and 4, from which extend reduced portions 5 and 6 respectively. Resting upon these shoulders and journaled upon the reduced portions 5 and 6 of shafts 1 and 2, are ribbon spools 7 and 8 respectively, adapted to carry the inking ribbon 9 and feed the same longitudinally of the machine in either direction past the printing point, the ribbon alternately winding upon one spool and unwinding from the other.

Shafts 1 and 2 at their lower ends are provided with worm wheels 10 and 11, which mesh with worm wheels 12 and 13 respectively carried at either end of the main ribbon feed driving shaft 14. Driving shaft 14 is connected in any suitable manner to the 105 universal bar or other frequently moving

part of the machine so as to be rotated in one direction by a step-by-step movement, the connecting and actuating parts for this shaft being omitted from the drawings in the interest of clearness of illustration, inasmuch as they of themselves comprise no essential part of my present invention. At this point, it may be noted that the spirals of the worm wheels at opposite ends of the machine are oppositely arranged in order that shafts 1 and 2 may be rotated in opposite directions by means of the main driving shaft 14.

The upper and lower flanges of ribbon spools 7 and 8 are each provided with a series of concentrically arranged openings 15 and 16 respectively, as clearly shown in Fig. 2, for a purpose presently to be made apparent.

Extending through each of hollow shafts 1 and 2 are connecting pins 17 and 18, the upper ends of which are bent outwardly and thence extend upwardly, as at 19 and 20, extending through lateral openings 21 and 22 of shafts 1 and 2 respectively. Connecting pins 17 and 18 are capable of longitudinal reciprocation in their respective shafts and are compelled to rotate with said shafts, the upper ends thereof describing circles equal in circumference to the circumference of the concentrically arranged openings in the flanges of the ribbon spools.

Pinned, as at 23, to the lower ends of connecting pins 17 and 18 are abutments 24 and 25 respectively, spaced, slightly apart to receive the ends of counter-balanced tilt beam or bar 26, which is pivotally mounted at 27 to a fixed portion of the frame of the machine. Connecting pins 17 and 18, therefore, as will be understood from Fig. 1 of the drawings, rest upon either end of beam 26 and, when said beam is tilted in either direction, one of said pins will be forced upwardly in its encircling shaft until its upper end enters one of the concentrically arranged openings in the flange of its ribbon spool, and simultaneously with its upward movement, the other of said pins is dropped by gravity out of one of the concentrically arranged openings in the other of said spools.

It will be apparent that when either of connecting pins 17 or 18 is in engagement with its ribbon spool, the other pin will be out of engagement with the opposite ribbon spool and the first-mentioned spool, being connected to rotate with the driving shaft, will be the winding spool, the other or delivery spool being free to rotate upon its driving shaft.

In order that counter-balanced tilt beam 26 may be tilted automatically to reverse the feed of the ribbon when the ribbon is substantially exhausted from one of said ribbon spools, said beam is provided with a lateral extension 28 which extends upwardly and is, in turn, provided with a lateral extension 29. Extension 29 is adapted to be received be-

tween two abutments, preferably as shown herein in the form of pins 30 and 31 extending from link 32, said pins or abutments being spaced apart to a greater extent than the width of extension 29. The ends of link 32 are overturned to enter openings in the ends of lever arms 33 and 34 suitably keyed upon the lower ends of trip levers 35 and 36 respectively, which are suitably journaled in the frame of the machine. Trip levers 35 and 36 are substantially crank-shaped, the upper ends 37 and 38 being in the present instance turned downwardly at 39 and 40 respectively to form narrow passageways 41 for inking ribbon 9. It is, of course, obvious that the specific construction of the trip levers 35 and 36, whereby the narrow passageways 41 for the inking ribbon are secured, is immaterial, and that for the downwardly turned portions could be substituted a bifurcated upwardly extending member.

Trip levers 35 and 36 and lever arms 33 and 34 respectively are preferably arranged in a parallel relation, as shown, so that a given swing of crank arms 35 and 36 will cause a corresponding angular swing of lever arms 33 and 34.

Keyed to trip lever 36 and extending, in the present instance, at substantially a right angle to lever arm 34, is a lever arm 42 having a projecting stud 43 which is connected by a retractile spring 44 to a fixed part of the machine, as at 45.

Spring 44 is adapted to exert pressure upon lever arm 42 upon either side of trip lever 36 as a pivotal center and, inasmuch as lever arms 34 and 42 and trip lever 36 are rigidly connected, trip lever 36 will be maintained in either of two positions with respect to its pivotal point.

Link 32 connecting lever arms 33 and 34 will, of course, cause a pivotal movement of trip lever 35 corresponding with the angular movement of trip lever 36.

Inking ribbon 9 is, near either end thereof, provided with enlargements or abutments 46, one of which is clearly shown in Fig. 2, the abutment at the opposite end being covered by the windings of the ribbon. Abutments 46 are of larger dimensions than the width of the passageways 41 in the trip levers through which the inking ribbon travels.

Having described my invention, the operation, which should be largely obvious from the above description, is substantially as follows: Counter-balanced beam 26 being tilted as shown in Fig. 1, spool 7 is by means of pin 17 connected to rotate with shaft 1 and is, accordingly, the take-up or winding spool, spool 8 being the unwinding or delivery spool, with trip levers 35 and 36 occupying the positions shown in Figs. 1 and 2. When the continued travel of the ribbon by means of main driving shaft 14 coacting through its worm connection with shaft 1, has substantially un-

65 Extension 29 is adapted to be received be- 190

wound said ribbon from spool 8, the abutment near that end of the ribbon is brought into engagement with the walls of passageway 41 in trip lever 36. Abutment 46, being of larger size than said passageway, cannot pass therethrough, and the further feed of the inking ribbon will cause trip lever 36 to rotate against the tension of spring 44, which exerts a pull on crank arm 42. When, however, stud 43 of lever arm 34 to which spring 44 is attached has been carried past the dead center point, spring 44 will accelerate the swinging of trip lever 36. Link 32, connected with trip lever 35 through lever arm 33, will, by this swinging of trip lever 36 be reciprocated to bring abutment 31 into engagement with the turned-over portion of extension 29 of counter-balanced tilt beam 26, and will tilt said beam to allow connecting pin 17 to fall by gravity from engagement with take-up spool 7, thereby disconnecting said spool from driving shaft 1. Simultaneously with the disengagement of pin 17 from spool 7, however, pin 18 will have been forced into one of the openings in the flange spool 8, thereby making a connection with said spool and shaft 2. Shaft 2 rotating in an opposite direction from shaft 1, as hereinbefore explained, will cause the ribbon to wind upon spool 8, whereby the direction of the feed is reversed. Trip levers 35 and 36, being connected by means of link 32 to swing in unison, will now occupy the positions shown in the dotted lines of Fig. 2, and when the end of the ribbon upon spool 7 has been reached, the other abutment thereon engaging the walls of the passageway 41 in trip lever 35 will cause a reversal of the operations next above described, spring 44, as before, serving to accelerate the swinging of trip levers 35 and 36 in opposite directions. Accordingly, it will be seen that I have provided ribbon reversing mechanism wherein the objects of my invention are achieved, characterized by simplicity of structure and efficiency of action. The reversal of the ribbon takes place substantially instantaneously, precluding the striking of several type characters upon the same spot of the inking ribbon during the reversing operation. Among several others, a further advantage resides in the fact that there is practically no strain upon the inking ribbon, due to the supporting of the connecting members upon the counter-balanced tilt bar.

While I have shown and described my invention as applied to a typewriting machine of the above type, I do not wish to be understood as limiting its employment to machines of this, nor in fact to any other type, as the same may be used to great advantage in other forms of machines.

As many changes could be made in the above construction and many apparently widely different embodiments of my inven-

tion could be made without departing from the scope thereof, I intend that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having described my invention, what I claim as new, and desire to secure by Letters Patent is:—

1. In a typewriting machine, the combination with an inking ribbon of a pair of ribbon spools, driving means for said spools, a movable member for each spool adapted to connect said spool with the driving means, and means controlled by the tension of the ribbon adapted simultaneously to move said connecting members in opposite directions, whereby one of said spools is connected with the driving means and the other of said spools is disconnected therefrom.

2. In a typewriting machine, the combination with an inking ribbon, of a pair of ribbon spools, means adapted alternately to drive said spools in opposite directions, and a pair of balanced connecting members, one for each spool, adapted to connect one of said spools with its driving means and simultaneously to disconnect the other of said spools from its driving means, said connecting and disconnecting operations being operated by the tension of the ribbon.

3. In a typewriting machine, the combination with an inking ribbon, of a pair of ribbon spools, means adapted alternately to drive said spools in opposite directions, a pair of connecting members, one for each spool, a balanced member adapted at either end thereof to support one of said members, and means controlled by the tension of the ribbon adapted to tilt said balanced member to engage one of said connecting members with its spool and simultaneously to disengage the other of said connecting members from its spool.

4. In a typewriting machine, in combination, a pair of spools adapted to carry the inking ribbon and feed the same in opposite directions, driving means for each spool, means adapted alternately to connect each of said spools with its driving means, a balanced tilt-beam upon either end of which one of said connecting means is supported, and means controlled by the tension of the ribbon adapted to tilt said beam to engage one of said connecting means with one of said ribbon spools and simultaneously to disengage the other of said connecting means from its ribbon spool.

5. In a typewriting machine, in combination, a pair of spools adapted to carry the inking ribbon and feed the same alternately in opposite directions, means adapted alternately to connect each of said spools with its driving means, a balanced tilt-beam upon either end of which one of said connecting

means is supported, means controlled by the tension of the ribbon adapted to tilt said beam to engage one of said connecting means with one of said ribbon spools and simultaneously to disengage the other of said ribbon spools from its driving means, and means adapted to accelerate said engaging and disengaging operations.

6. In a typewriting machine, in combination, a pair of spools adapted to carry the inking ribbon and feed the same in opposite directions, driving means for each of said spools, means adapted alternately to connect each of said spools with its driving means, a balanced tilt-beam supporting at either end of said connecting means, means controlled by the tension of the ribbon adapted to tilt said beam to engage thereby one of said connecting means with one of said ribbon spools and simultaneously to disengage the other of said connecting means from the other of said ribbon spools, and a spring adapted to accelerate said engaging and disengaging operation.

7. In a typewriting machine, the combination with an inking ribbon of a pair of ribbon spools adapted to carry the ribbon, driving mechanism for said spools, a pair of connectors, one for each spool, and means interposed in the path of the ribbon adapted when the same becomes tensioned to move said connectors simultaneously in opposite directions whereby one of said spools is connected with its driving means and the other of said spools is disconnected from its driving means whereby the feed of the ribbon is reversed.

8. In a typewriting machine, the combination with the inking ribbon, of a pair of ribbon spools adapted to carry the ribbon, driving mechanism for said spools, a pair of connectors, one for each spool, a balanced member supporting at either end one of said connectors, said balanced member being free to tilt in either direction, and means interposed in the path of the ribbon adapted when said ribbon becomes tensioned to tilt said balanced member to engage thereby one of said connectors with one of said spools and simultaneously to disengage the other of said connectors from the other of said spools, whereby the feed of the ribbon is reversed.

9. In a typewriting machine, the combination with the inking ribbon, of a pair of spools adapted to carry the ribbon, driving mechanism for said spools, a pair of connectors, one for each spool, a balanced member supporting at either end one of said connectors, said balanced member being free to tilt in either direction, means interposed in the path of the ribbon adapted when said ribbon becomes tensioned to tilt said balanced member to engage thereby one of said connectors with one of said spools and simultaneously to disengage the other of said con-

nectors from the other of said spools whereby the feed of the ribbon is reversed, and means free from said balanced member for accelerating the tilting operation thereof in either direction.

10. In a typewriting machine, the combination with an inking ribbon, of a pair of spools adapted to feed said ribbon longitudinally in opposite directions, driving shafts adapted rotatably to support each of said spools, mechanism for driving said shafts in opposite directions, a pair of reciprocating connectors, one for each spool, and means interposed in the path of the ribbon adapted when the same becomes tensioned to reciprocate said connectors simultaneously in opposite directions whereby one of said spools is connected to rotate with its driving shaft and the other of said spools is disconnected from its driving shaft.

11. In a typewriting machine, the combination with an inking ribbon, of a pair of spools adapted to carry the ribbon, a pair of driving shafts one for each spool, connectors for each spool and its driving shaft, a balanced member either end of which supports one of said connectors, and means the operation of which is determined by the tension of the ribbon adapted to tilt said balanced member to engage one of said connectors with its spool and simultaneously to disengage the other of said connectors from its spool.

12. In a typewriting machine, the combination with an inking ribbon, of a pair of spools adapted to feed the same alternately in opposite longitudinal directions, driving shafts, one for each spool, means for driving said shafts in opposite directions, a pair of connectors, one for each spool, adapted to connect each of said spools with its driving shaft, a balanced member supporting at either end one of said connectors, means for tilting said balanced member to engage thereby one of said connectors with its spool and simultaneously to disengage the other of said connectors from its spool, and means interposed in the path of the ribbon adapted when the same becomes tensioned to operate said last-mentioned means.

13. In a typewriting machine, the combination with an inking ribbon, of a pair of spools adapted alternately to feed the ribbon in opposite longitudinal directions, driving shafts, one for each spool, means for driving said shafts in opposite directions, a pair of connectors, one for each spool, adapted alternately to connect each of said spools with its driving shaft, a balanced member supporting at either end thereof one of said connectors, means for tilting said balanced member to engage thereby one of said connectors with its spool and simultaneously to disengage the other of said connectors from its driving spool, and pivotally mounted means

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interposed in the path of the ribbon adapted when the same becomes tensioned to operate said last-mentioned means.

14. In a typewriting machine, the combination with an inking ribbon of projections arranged near the opposite ends of said ribbon, a pair of spools adapted alternately to feed the ribbon in opposite longitudinal directions, a driving shaft for each ribbon, means for driving said shafts in opposite directions, a pair of connectors, one for each ribbon spool, adapted alternately to connect each of said spools with its driving shaft, a balanced member supporting at either end thereof one of said connectors, means for tilting said balanced member to engage thereby one of said connectors with its spool and simultaneously to disengage the other of said connectors from its spool, and pivotally mounted means interposed in the path of the ribbon adapted to be engaged by either of said projections to operate said last-mentioned means.

15. In a typewriting machine, the combination with an inking ribbon, of projections arranged near the opposite ends of said ribbon, a pair of spools adapted to feed the ribbon alternately in opposite longitudinal directions, a driving shaft, for each spool, means for driving said shafts in opposite directions, a pair of connectors, one for each spool, adapted alternately to connect each of said spools with its driving shaft, a balanced member provided with a lateral projection, said balanced member supporting at either end thereof one of said connectors, means adapted to engage the lateral projection of said balanced member to tilt the same to engage thereby one of said connectors with its spool and simultaneously to disengage the other of said connectors from its spool, and means interposed in the path of the ribbon adapted to be engaged by either of said projections to operate said last-mentioned means.

16. In a typewriting machine, the combination with an inking ribbon, of abutments arranged near the opposite ends of said ribbon, a pair of spools adapted to feed the ribbon alternately in opposite, longitudinal directions, driving shafts, one for each spool,

means for driving said shafts in opposite directions, a pair of connectors, one for each spool, adapted alternately to connect each of said spools with its driving shaft, a balanced member provided with a lateral extension, said balanced member supporting at either end thereof one of said connectors, means adapted to engage said lateral extension to tilt said balanced member whereby one of said connectors is engaged with its spool and the other of said connectors is simultaneously disengaged from its spool, and pivotally mounted trip-leaders interposed in the path of the ribbon adapted to be engaged by said abutments whereby said last-mentioned means may be operated.

17. In a typewriting machine, in combination with the inking ribbon, of a pair of ribbon spools, a pair of connectors, one for each spool, a pair of driving shafts, one for each spool, and a balanced member free to tilt in either direction, said balanced member supporting at either end one of said connectors and adapted to engage one of said connectors with its ribbon spool and simultaneously to disengage the other of said connectors from its ribbon spool, the tilting of said balanced member being controlled by the tension of the ribbon.

18. In a typewriting machine, in combination with the inking ribbon, of a pair of ribbon spools, a pair of connectors, one for each spool, a pair of driving shafts, one for each spool, and a balanced tilt beam free to tilt in either direction, said beam supporting at either end one of said connectors, said connectors being free from said spools and also free from said tilt beam, said tilt beam being adapted to engage one of said connectors with its ribbon spool and simultaneously to disengage the other of said connectors from its ribbon spool, the tilting of said balanced tilt beam being controlled by the tension of the ribbon.

In testimony whereof I affix my signature, in the presence of two witnesses.

WELLINGTON P. KIDDER.

Witnesses:

JOSIAH H. PECK,  
CORA A. STEIN.