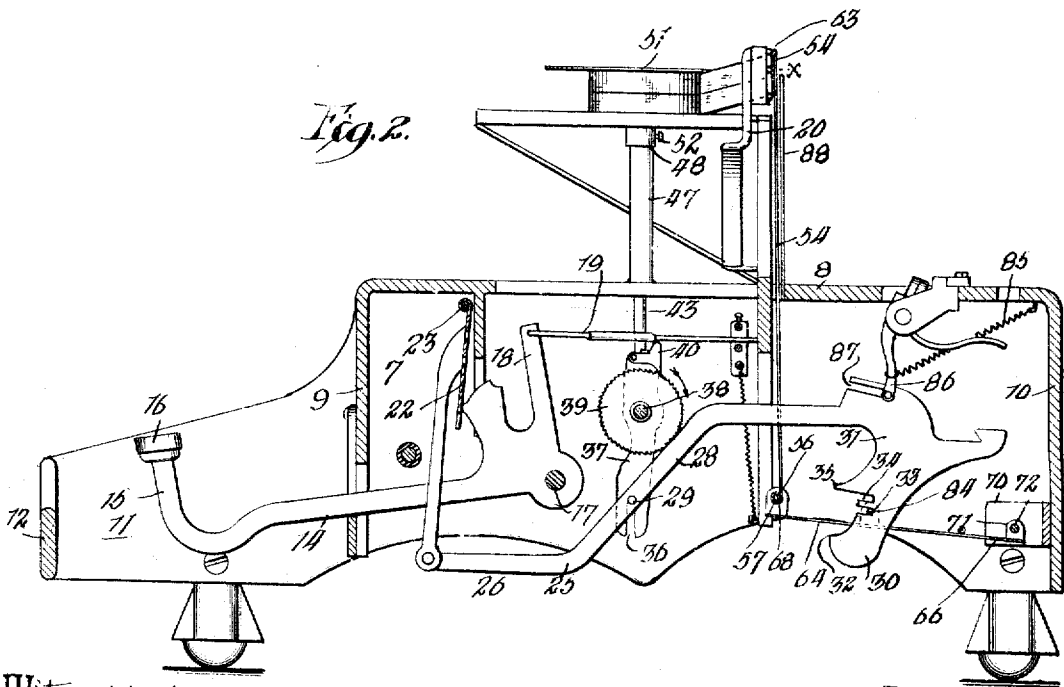
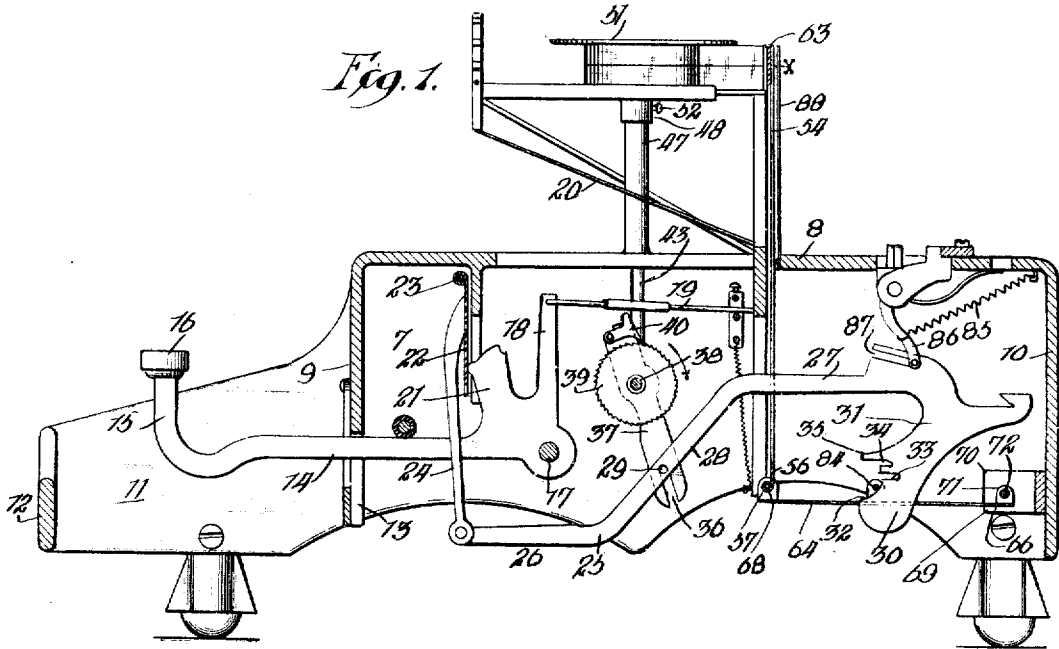


R. W. UHLIG.
RIBBON FEEDING MECHANISM FOR TYPE WRITERS.
APPLICATION FILED DEC. 28, 1908.

936,834.

Patented Oct. 12, 1909.
3 SHEETS—SHEET 1.



Witnesses:
W. P. Bond
Person W. Banning

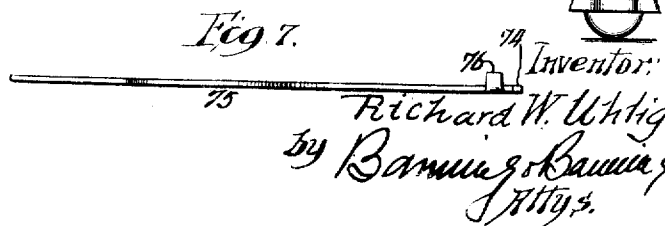
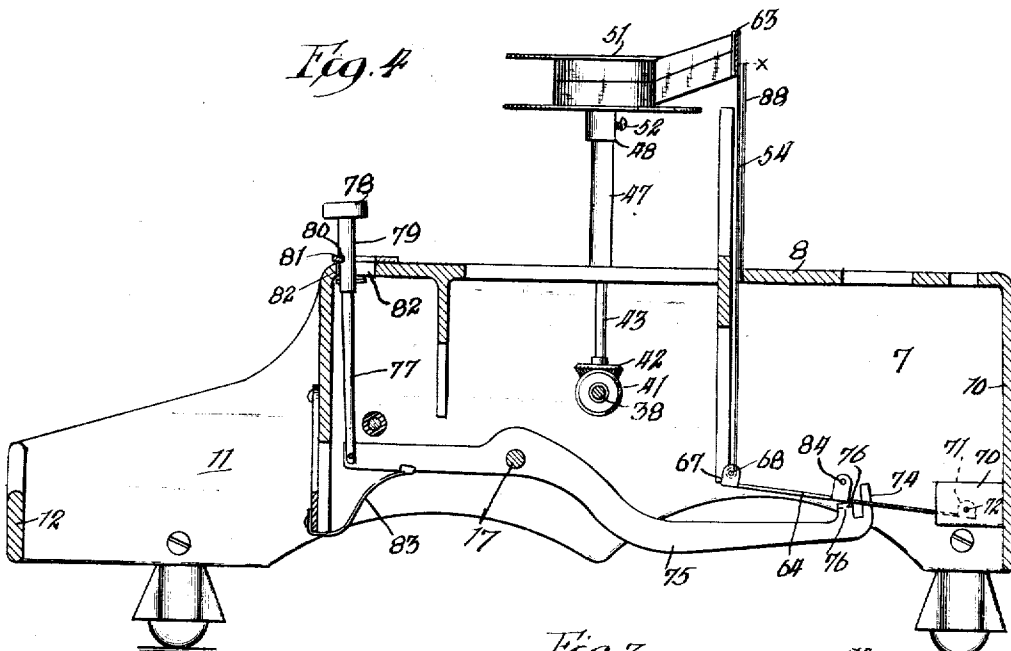
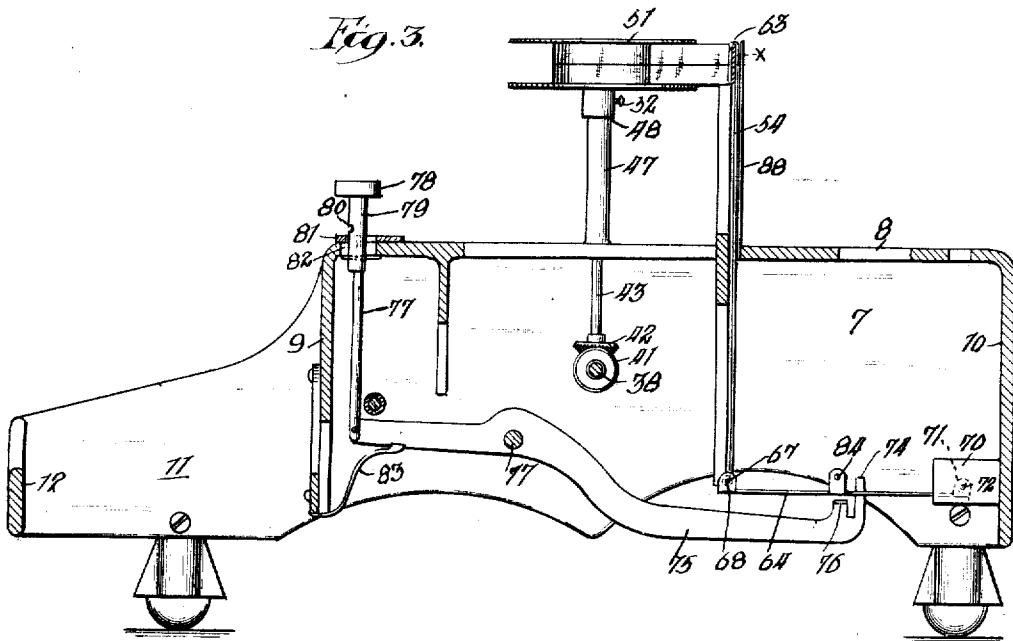
Inventor:
Richard W. Uhlig
by Bonning & Banning
Attys.

R. W. UHLIG.
 RIBBON FEEDING MECHANISM FOR TYPE WRITERS.
 APPLICATION FILED DEC. 28, 1908.

936,834.

Patented Oct. 12, 1909.

3 SHEETS—SHEET 2.



Witnesses:

J. P. Bond

Parson W. Banning

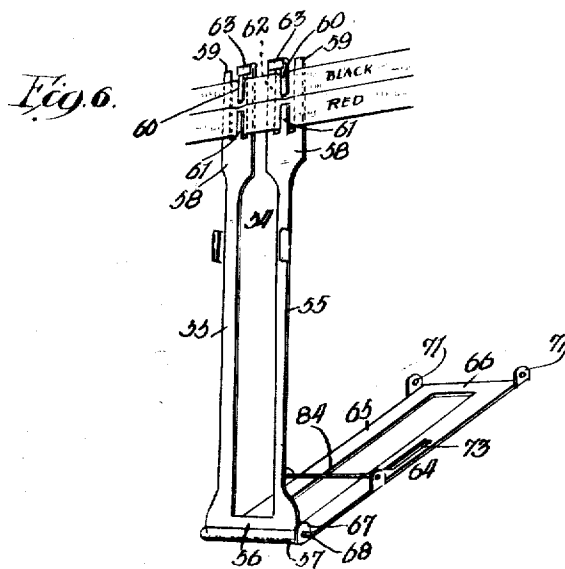
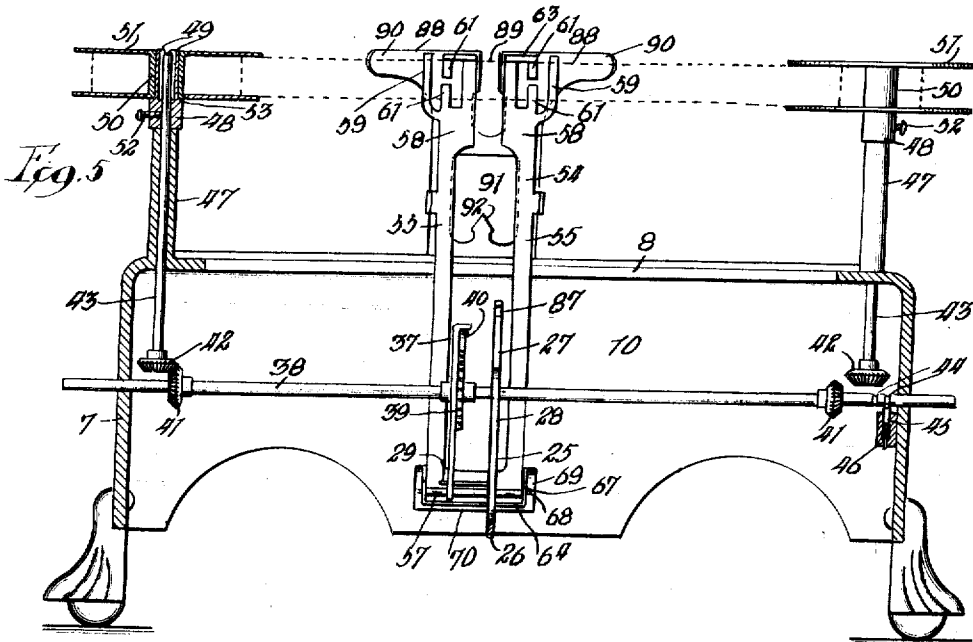
Inventor:
Richard W. Uhlig
 by *Banning & Banning*
Attys.

R. W. UHLIG.
RIBBON FEEDING MECHANISM FOR TYPE WRITERS.
APPLICATION FILED DEC. 28, 1908.

936,834.

Patented Oct. 12, 1909.

3 SHEETS—SHEET 3.



Witnesses:
W. P. Bond
Pearson W. Banning.

Inventor:
Richard W. Uhlig
by Banning Banning
Attys.

UNITED STATES PATENT OFFICE.

RICHARD W. UHLIG, OF RUTHERFORD, NEW JERSEY, ASSIGNOR TO EMERSON TYPE-WRITER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF MAINE.

RIBBON-FEEDING MECHANISM FOR TYPE-WRITERS.

936,834.

Specification of Letters Patent.

Patented Oct. 12, 1909.

Application filed December 28, 1908. Serial No. 489,576.

To all whom it may concern:

Be it known that I, RICHARD W. UHLIG, a citizen of the United States, residing at Rutherford, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Ribbon-Feeding Mechanism for Type-Writers, of which the following is a specification.

This invention relates to the mechanism employed for feeding a typewriter ribbon longitudinally on a visible writing typewriter, and also to mechanism for imparting a vibrating movement to the ribbon for exposing the printed line after each stroke of the type; to the mechanism for reversing the longitudinal feed of the ribbon; to the mechanism for shifting the ribbon, in cases where a two-colored ribbon is used; and to mechanism for actuating the aforesaid devices by each stroke of the key levers.

The primary object of the invention is to simplify the ribbon feeding mechanism to the greatest possible degree; and to so construct and arrange the various devices entering into the mechanism as a whole, that they may be firmly and conveniently mounted on the machine frame in such a manner as to eliminate the unnecessary multiplying of parts and the resultant complicating of the machine.

Another object of the invention is to so locate and mount the ribbon spools that they will feed the ribbon in a substantially straight line in either direction, without passing the ribbon over rollers or other devices whereby its direction of feed will be changed, thereby rendering the feeding action more positive and certain and relieving the ribbon from unnecessary friction, so that the action of the machine will be easy and reliable.

Another object of the invention is to so construct and mount the ribbon shift key that it will be in a convenient position for the operator and will be capable of quick and easy adjustment.

Further objects will appear from a detailed description of the invention, which consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a longitudinal sectional elevation, taken through the center of a typewriter, from front to rear, showing a key lever in normal position, and

with the carriage feed, platen and other mechanism, not involved in the present invention, removed; Fig. 2 a similar view, showing the key lever depressed; Fig. 3 a view similar to Fig. 1, showing the ribbon shift mechanism in normal position; Fig. 4 a similar view, showing the mechanism in shifted position; Fig. 5 a sectional elevation, taken from side to side of the machine, showing the ribbon holder and associated elements; Fig. 6 a perspective view, showing the ribbon holder; and Fig. 7 an edge view of the shift lever.

The frame of the typewriter comprises side walls 7, a flat rectangular top wall 8, and front and rear walls 9 and 10, respectively. The side walls are carried forward in the form of extensions 11 which are connected, at their front ends, by a front rail 12, which arrangement furnishes a space for the location of several banks of keys, only one key being shown in the present drawings. The front wall 9 is provided, in its lower edge, with a plurality of slots 13, one for each of a plurality of key levers 14, each of which, at its forward end 15, is upturned to receive a button 16 of the usual character. The key levers are all hinged to a transversely extending key lever rod 17, the ends of which are supported within the side walls of the frame. Each of the key levers is provided, at its inner end, with a vertically extending arm 18, from which extends a link 19 which serves to actuate a type bar 20. When any key is depressed, its type bar will be swung to the center of the machine to a point marked X, which indicates the striking point on the writing line; but, in view of the fact that the present invention is not concerned with the construction of the type bar or its mode of operation, it is deemed not necessary to refer to these features at length. Each key lever is provided, immediately in front of the arm 18, with an upwardly extending prong 21, which prongs engage a universal bar 22 which is hinged, at its upper edge, to a transversely extending rod 23, the arrangement being one whereby the free end of the universal bar will be swung forward with each depression of a key lever, as clearly indicated in Fig. 2. The universal bar has secured, to its front face, a depending arm 24 which extends below the line of key levers and is pivoted, at its lower end, to a link bar 25. The link bar

is of the formation shown in Figs. 1 and 2 and comprises a straight front section 26 and a straight rear section 27, parallel and offset with respect to one another and connected by means of a diagonally extending intermediate section 28, which intermediate section carries a laterally projecting pin 29. The rear section 27 terminates in a depending head 30 connected with the end of the arm by a neck 31. The front edge 32 of the head, near its lower end, is slightly concaved and merges into a lower slot 33. The slot 33 lies immediately below an upper slot 34 which is overhung by a projection 35. The link bar is further designed to assist in the carriage feeding operations, but a description of this portion of the typewriter is deemed not necessary.

The pin 29 engages a slot 36 in the lower end of a dog arm 37, which is pivoted to a feed shaft 38 on which is rigidly mounted a ratchet wheel 39. The dog arm, at its upper end, carries a dog 40 which engages the teeth of the ratchet wheel and is adapted to impart intermittent rotation thereto in the direction of the arrow. The ends of the feed shaft 38 are entered through and project beyond the side walls of the frame, within which the shaft is slidably and rotatably mounted. The shaft is provided, near its ends, with a pair of oppositely facing driving bevel pinions 41 cooperating with a pair of driven bevel pinions 42, which are mounted upon the lower ends of a pair of vertical spool shafts 43, located just within the side walls of the frame. The position of the driving bevel pinions on the feed shaft is such that only one of said driving pinions can be brought into mesh with its driven bevel pinion at a given time, it being necessary to shift the feed shaft longitudinally in one direction or the other to vary the feeding direction for the ribbon. In order to hold the feeding shaft against longitudinal displacement, after it has been adjusted to the intended position, the shaft is provided, near one of its ends, with a pair of circumferential grooves 44, as shown in Fig. 5, either one of which is adapted to receive the projecting end of a spring supported shouldered pin 45 which is entered within a block 46 secured to the side wall of the frame immediately below the feeding shaft. The arrangement is one which holds the shaft against accidental displacement, and at the same time permits adjustment when a reasonable pressure is brought to bear on one of the projecting ends of the shaft. The ribbon shafts 43 are journaled within a pair of upwardly extending tubular posts 47, which are integrally formed and upwardly project from the top wall of the frame, slightly in front of the printing line and on opposite sides of the machine.

Referring to the right hand side of Fig.

5, each of the shafts 43 projects a considerable distance above the tubular post 47 and is provided, on its upper end, with a collar 48, which is provided with a plurality of spring prongs 49 which encircle the upper end of the shaft and are adapted to be entered through the hub 50 of a ribbon spool 51, the arrangement being one which permits the spool as a whole to be mounted upon the spring prongs and held under a slight spring tension, sufficient to draw forward the ribbon under normal conditions, but insufficient to break the ribbon in case it be completely unwound from the opposite end. The collar 48 is held in place by means of a set screw 52, and the arrangement of the spring prongs is one which affords a shoulder 53 against which the lower end of the spool hub abuts. The ribbon is fed from the rear sides of the spools through the upper end of a ribbon holder 54, which comprises a pair of vertical side arms 55, connected, at their lower end, by a cross bar 56, which is bent to afford a sleeve 57, as shown in Figs. 1 and 2. The vertical side arms 55 terminate, at their upper ends, in a pair of heads 58, each of which is slotted to permit the passage of the ribbon, as best shown in Fig. 6. Each of the heads is provided with a side prong 59, upper and lower intermediate prongs 60 and 61, respectively, and an inner prong 62, which is connected with and serves to support the upper intermediate prongs which depend from a cross head 63.

The ribbon is positioned to lie in front of the inner and outer prongs and behind the upper and lower intermediate prongs. Between the ends of the intermediate prongs a space is afforded, which permits the upper edge of the ribbon to be slipped in behind the upper intermediate prong and thereafter permits the lower edge of the ribbon to be lifted over the lower intermediate prong. The arrangement is one which permits the ribbon to be readily positioned, and, when thus positioned on each side of the holder, the ribbon will be held securely against displacement, and at the same time freely permitted to feed forward with each stroke of the type. The ribbon holder is mounted upon and actuated by a lift plate 64, which comprises side arms 65 and a rear cross head 66. The side arms, at their front ends, are provided with ears 67 which embrace the ends of the sleeve 57 and serve to receive a pin or pivot 68 which hinges the parts together. The lift plate extends in horizontal position rearwardly from the lower end of the ribbon guide and is pivoted, at its rear end, between ears 69 of a bracket 70, which is riveted or otherwise secured to the rear wall of the frame. In order to permit the lift plate to be thus pivoted, it is provided with a pair of rear ears 71 which

receive a pivot rod or pin 72, the ends of which are entered through the ears of the bracket and serve to hinge the parts together. One of the side arms 65 of the lift plate is provided with a slot 73, which receives a finger 74 on the inner end of a shift lever 75. The finger is supplemented by a flanged stop 76, which engages the under face of the lift plate, adjacent to the slot therein, and serves to lift the plate, shown in Fig. 4, when the forward end of the shift lever is depressed. The lever itself is pivoted to the key lever rod 17, near the center of the rod, and the forward end of the lever has pivoted thereto the lower end of a shift rod 77, which carries, at its upper end, a button 78 having a socket sleeve 79 to receive the upper end of the shift rod 77.

The socket sleeve is provided with a notch 80 which is adapted to engage with the inwardly projecting edge of a catch plate 81, which slightly overhangs the hole 82, through which socket the sleeve projects. The arrangement is one which permits the shifting mechanism to be locked, when depressed and thrown forward to the position shown in Fig. 4, against the tension of a spring 83 which engages the lower edge of the lever 75. The lift plate is provided with a transversely extending rod 84 which, when the parts are in normal position, as shown in Fig. 1, bears against the concaved edge 32 of the head of the link bar. The link bar is normally held in retracted position by the action of the spring 85 which connects with a pivoted arm 86 forming a part of the carriage feed mechanism, which, in turn, engages a slot 87 in the upper side of the rear end of the link bar. Immediately behind the ribbon guide is a spring guard plate 88, which is slotted in its center 89 to permit the striking of the type, and is provided with side arms 90 which press against the front surface of the paper and hold it firmly against the platen during the printing operation. The guard plate is cut away in its center 91, and is provided with a pointer 92 adapted to register with a suitable scale, not shown, on the carriage, for indicating the position of the platen.

In use, with the parts in the position shown in Fig. 1, the type bar 20 will be thrown back and the ribbon will be in its lowered position. When any one of the key levers is struck, the prong 21 will be thrown forward by the depression of the key lever, and will swing forward the free end of the universal bar, thereby drawing forward the link bar to the position shown in Fig. 2. This forward movement of the link bar imparts a forward swing to the lower end of the dog arm, and a corresponding rearward movement to the upper end carrying the dog. This serves to move forward the ratchet wheel in the direction of the arrow, thereby

rotating the feed shaft 38 and with it both driving bevel pinions 41, one only of which will be in mesh. This serves to revolve the desired spool shaft in the proper direction to pull forward the ribbon intermittently 70 with each stroke of a key lever, the intermeshed spool, meanwhile, revolving under the tension of the ribbon. At the beginning of each stroke, the ribbon will occupy a position below the printing line to expose 75 the paper, but, as a key lever is depressed and the link bar swung forward, the concaved forward edge of the head 50 of the link bar, which engages the transverse rod 84 on the lift plate, will cause the latter to 80 ride up and enter the lower slot 33, as shown in Fig. 2. This elevates the lift plate and raises the ribbon guide and with it the ribbon; so that, at the time the type bar delivers its stroke, the ribbon will be in a position intermediate the type and the printing 85 line. The return of the key lever to normal position allows the transverse rod on the lift plate to ride back to its lowermost position and the ribbon guide and ribbon to fall, 90 exposing the letter just printed. At the same time this return movement swings back the dog arm and carries the dog back into engagement with the next tooth on the ratchet wheel in preparation for further feed- 95 ing of the ribbon. The ribbon will feed in the intended direction so long as a selected pair of bevel pinions are held in mesh, and if, through the oversight of the operator, the ribbon should be entirely unwound from 100 one of the spools, to which its end is fastened, no damage would result to the ribbon, since the spring prongs which engage the winding spool would simply slip around 105 within the hub of the spool and attention would be called to the necessity for reversing the ribbon feed by the increased pressure required in striking the key levers, after which the feed can be reversed by longitudinally shifting the feeding shaft to throw 110 the other pair of bevel pinions into mesh. In moving the shaft longitudinally, the spring supported pin 45 will be pressed back and held until the intended groove 44 is brought into register, when the pin will 115 spring into the groove and hold the shaft against accidental displacement. In shifting the ribbon, the button 78 will be depressed, which elevates the lift plate sufficiently to bring the transverse rod 84, 120 which normally rests against the concaved edge 32, into engagement with the overhanging tooth or point 35 on the head of the link bar; and the contact with this tooth or point prevents excessive upward movement of the 125 lift plate. Thereafter, when the link bar is drawn forward during the ordinary operation of the machine, the slot 34 will afford a clearance for the rod 84, so that the movements of the link bar will not be interfered 130

with. When the ribbon is shifted in this manner, it will not be vibrated but will maintain a uniform elevated position all the time until thrown back to its normal or lowered position. This stationary elevated position will, obviously, be considerably above the highest point reached in the ordinary vibration of the ribbon, which point brings the center of the upper or black portion of the ribbon into register with the printing line, since on the shift it is necessary to elevate the ribbon sufficiently to bring the center of the lower section into register with the printing line. The resulting construction is a very simple one, requiring but relatively few parts, most of which are mounted directly upon the frame, which facilitates the assembling of the parts and results in a construction of great strength and rigidity.

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

1. In typewriter ribbon feeding mechanism, the combination of a frame having side walls, a feed shaft slidably and rotatably mounted within said side walls, oppositely facing driving bevel pinions on said feed shaft, tubular posts upwardly extending from the frame, spool shafts journaled within said tubular posts and provided on their lower ends with bevel pinions adapted to mesh with the driving bevel pinions when either of the latter is thrown into mesh, spools mounted upon the spool shafts, a ratchet wheel fixedly mounted on the feed shaft, a dog arm pivotally mounted on the feed shaft, a dog carried by said arm and adapted to engage the teeth of the ratchet wheel, said arm being provided with a slot, a universal bar adapted to be actuated with each printing stroke of the typewriter, an arm depending from said universal bar, a link bar pivoted to the end of the arm, and a pin outwardly extending from the link bar and engaging the slotted end of the dog arm, substantially as described.

2. In typewriter ribbon feeding mechanism, the combination of a frame having side walls, a feed shaft slidably and rotatably mounted within said side walls, oppositely facing driving bevel pinions on said feed shaft, tubular posts upwardly extending from the frame, spool shafts journaled within said tubular posts and provided on their lower ends with bevel pinions adapted to mesh with the driving bevel pinions when either of the latter is thrown into mesh, a collar for each of the spool shafts provided with spring prongs, spools provided with hubs slipped onto and held under spring tension on the spring prongs, a ratchet wheel fixedly mounted on the feed shaft, a dog arm pivotally mounted on the feed shaft, a dog carried by said arm and adapted to engage the teeth of the ratchet wheel, said

arm being provided with a slot, a universal bar adapted to be actuated with each printing stroke of the typewriter, an arm depending from the universal bar, a link bar pivoted to the end of the arm, and a pin outwardly extending from the link bar and engaging the slotted end of the dog arm, substantially as described.

3. In typewriter ribbon feeding mechanism, a ribbon holder provided at its upper end with two heads each having inner, outer and intermediate prongs, the intermediate prong being cut away to permit the insertion of a ribbon, behind said prong and in front of the inner and outer prongs, substantially as described.

4. In typewriter ribbon feeding mechanism, a vertically extending ribbon holder, a lift plate pivoted to the lower end of the ribbon holder, a universal bar, an arm depending from the universal bar, a link bar pivoted at its forward end to said arm and provided at its rear end with a cam surface, and a member on said lift plate adapted to be engaged by said cam surface and raised with every printing stroke of the typewriter, substantially as described.

5. In typewriter ribbon feeding mechanism, a vertically extending ribbon holder, a lift plate pivoted to the lower end of the ribbon holder, a universal bar, connections between the universal bar and the lift plate, for lifting the latter with every printing stroke of the typewriter, and a shift lever having its rear end in engagement with the lift plate and having at its forward end a key shank provided with a button for depressing the forward end of the shift lever when shifting the ribbon, substantially as described.

6. In typewriter ribbon feeding mechanism, a vertically extending ribbon holder, a lift plate pivoted to the lower end of the ribbon holder, a universal bar, an arm depending from the universal bar, a link bar pivoted at its forward end to said arm and provided at its rear end with a cam surface, a member on said lift plate adapted to be engaged by said cam surface and raised with every printing stroke of the typewriter, and a shift lever having its rear end in engagement with the lift plate and having at its forward end a key shank provided with a button for depressing the forward end of the shift lever when shifting the ribbon, substantially as described.

7. In typewriter ribbon feeding mechanism, a vertically extending ribbon holder, a lift plate pivoted to the lower end of the ribbon holder, a universal bar, connections between the universal bar and the lift plate, for lifting the latter with every printing stroke of the typewriter, a pivoted shift lever having its inner end in engagement with the lift plate, a vertical member pivot-

ed to the forward end of the shift lever and provided with a notch, a catch plate adapted to engage said notch when the notched member is depressed and swung into engagement with the catch plate, and a button on the notched member, substantially as described.

8. In typewriter ribbon feeding mechanism, a vertically extending ribbon holder, a lift plate pivoted to the lower end of the ribbon holder, a universal bar, an arm depending from the universal bar, a link bar pivoted at its forward end to said arm and provided at its rear end with a cam surface, a member on said lift plate adapted to be engaged by said cam surface and raised with every printing stroke of the typewriter, a pivoted shift lever having its inner end in engagement with the lift plate, a vertical member pivoted to the forward end of the shift lever and provided with a notch, a catch plate adapted to engage said notch when the notched member is depressed and swung into engagement with the catch plate, and a button on the notched member, substantially as described.

9. In typewriter ribbon feeding mechanism, a ribbon holder adapted to permit the longitudinal movement of the ribbon there-through, a lift plate hinged to the lower end of the ribbon holder at one end, a hinged mounting for the lift plate at the opposite end, a transversely extending bar secured to the lift plate, a link bar provided on its inner end with a head having a cam surface engaging said rod for lifting the rod with each forward movement of the link bar, and a universal bar with which the link bar is connected, substantially as described.

10. In typewriter ribbon feeding mechanism, a ribbon holder adapted to permit the longitudinal movement of the ribbon there-through, a lift plate hinged to the lower end of the ribbon holder at one end, a hinged mounting for the lift plate at the opposite end, a transversely extending bar secured to the lift plate, a link bar provided on its inner end with a head having a cam surface engaging said rod for lifting the rod with each forward movement of the link bar, a universal bar with which the link bar is connected, and a pivoted shifting lever having its inner end in engagement with the lift bar for raising the same with a depression of the forward end of the lever, substantially as described.

11. In typewriter ribbon feeding mechanism, a ribbon holder adapted to permit the longitudinal movement of the ribbon there-through, a lift plate hinged to the lower end of the ribbon holder at one end, a hinged mounting for the lift plate at the opposite end, a transversely extending bar secured to the lift plate, a link bar provided on its in-

ner end with a head having a cam surface engaging said rod for lifting the rod with each forward movement of the link bar, a universal bar with which the link bar is connected, and a pivoted shifting lever provided at its inner end with an up-turned finger entered through the lift bar and having a stop adjacent to said finger adapted to engage the lift bar with each depression of the forward end of the shifting lever, substantially as described.

12. In typewriter ribbon feeding mechanism, the combination of a frame, a feed shaft slidably and rotatably mounted within the sides of the frame and provided near its ends with oppositely facing driving bevel pinions, vertical spool shafts journaled within the frame and provided at their lower ends with bevel pinions either of which is adapted to mesh with its companion driving bevel pinion upon the longitudinal adjustment of the feed shaft, a ratchet wheel on the feed shaft, a dog arm pivoted to the feed shaft, carrying the dog adapted to engage with the teeth of the ratchet wheel a universal bar, a link bar connected with the universal bar, a pin on the link bar engaging the dog arm, a vertical ribbon holder, a lift plate connected to the lower end of the ribbon holder, said plate being connected with the inner end of the link bar and adapted to be raised by each forward movement thereof, substantially as described.

13. In typewriter ribbon feeding mechanism, the combination of a frame, a feed shaft slidably and rotatably mounted within the sides of the frame and provided near its ends with oppositely facing driving bevel pinions, vertical spool shafts journaled within the frame and provided at their lower ends with bevel pinions either of which is adapted to mesh with its companion driving bevel pinion upon the longitudinal adjustment of the feed shaft, a ratchet wheel on the feed shaft, a dog arm pivoted to the feed shaft, carrying the dog adapted to engage with the teeth of the ratchet wheel a universal bar, a link bar connected with the universal bar, a pin on the link bar engaging the dog arm, a vertical ribbon holder, a lift plate connected to the lower end of the ribbon holder, said plate being connected with the inner end of the link bar and adapted to be raised by each forward movement thereof, and a pivoted shift lever having its inner end in engagement with the lift plate and adapted to have its outer end depressed to shift the position of the ribbon, substantially as described.

RICHARD W. UHLIG.

Witnesses:

B. F. GRAY,

V. T. BRASSARD.