

W. P. KIDDER.

TYPE WRITER.

APPLICATION FILED FEB. 15, 1906.

997,562.

Patented July 11, 1911.

FIG. 1.

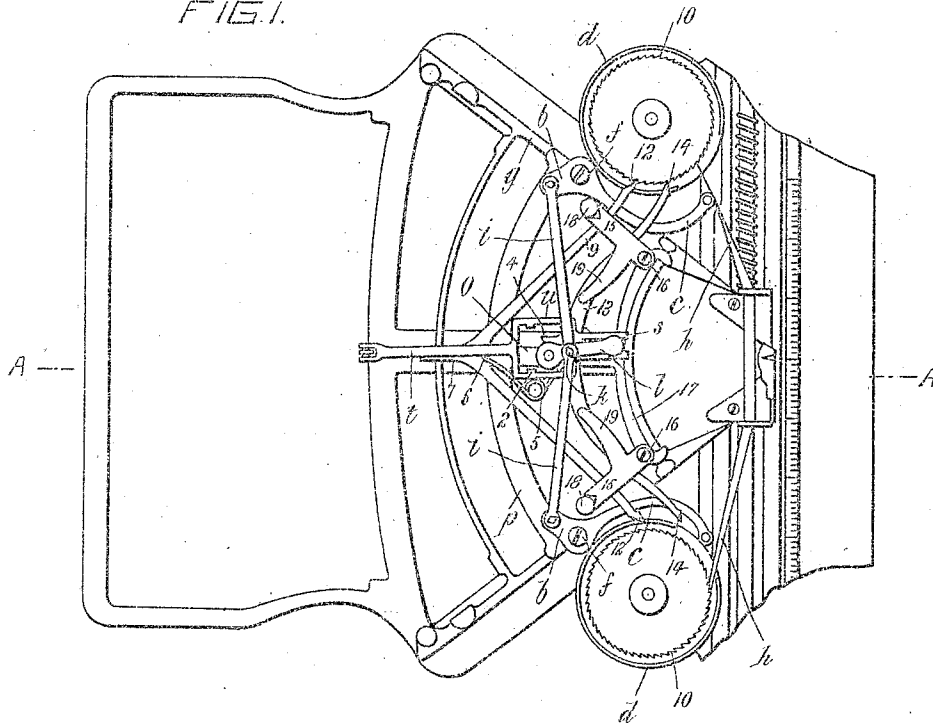


FIG. 2.

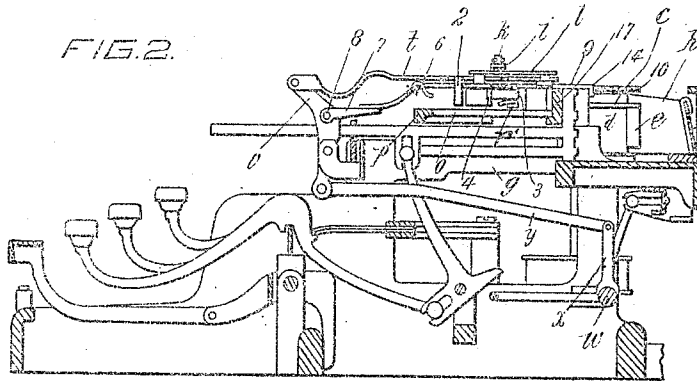
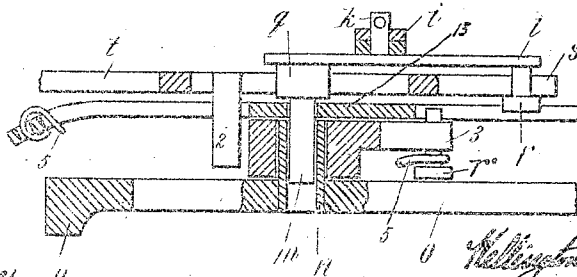


FIG. 3.



Witnesses

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WELLINGTON PARKER KIDDER, OF BOSTON, MASSACHUSETTS.

TYPE-WRITER.

997,562.

Specification of Letters Patent.

Patented July 11, 1911.

Original application filed February 1, 1904, Serial No. 191,602. Divided and this application filed February 15, 1906. Serial No. 301,278.

To all whom it may concern:

Be it known that I, WELLINGTON PARKER KIDDER, of the city of Boston, State of Massachusetts, United States of America, have
5 invented certain new and useful Improvements in Type-Writers; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention has for its object to provide an automatic ribbon reverse which will
10 be caused, while being automatically brought into action, to perform its function by a manual action thereby reducing the resistance to this portion of the mechanism to a
15 minimum.

The invention may be said briefly to consist of a movable device intersecting the line between the supporting surfaces of the ribbon drums and adapted to be moved by the
20 ribbon when it becomes taut, or begins to tighten, and means co-acting with said device and obstructing a movable part the movement whereof is due to the stroke upon the keys, and an operative connection be-
25 tween such last mentioned part and the ribbon reversing mechanism whereby the first stroke upon the key will, through the medium of such part, reverse the ribbon shifter.

For full comprehension, however, of my invention reference must be had to the accompanying drawings forming a part of this specification in which similar reference
30 characters indicate the same parts and wherein—
35

Figure 1 is a plan view of a portion of a typewriter provided with my improvements; Fig. 2 is a longitudinal vertical sectional view thereof taken on line A. A. Fig. 1;
40 Fig. 3 is a detail longitudinal sectional view taken through the center of the machine and illustrating particularly the pivotal connection of the levers of the ribbon reverse to the frame.

The improved automatic ribbon feed and reverse consists of a pair of bell-crank levers each having one arm *b* shorter than the other *c*, the latter being curved to clear the ribbon drums *d* (of usual construction)
50 and preferably having a depending anti-friction roller *e* at what may be designated, its bearing end. These bell-crank-levers are

fulcrumed at their angles as at *f*, to the frame *g* of the machine in a manner and in positions to enable their bearing ends to be swung into intersection of the path of the ribbon, indicated at *h*, while the ends of the short arms are connected by links *i* pivoted at a common point to a pin *k* upon a lever arm *l*. One end of this lever arm has an arbor *m* rigidly secured thereto and projecting into a guiding sleeve *n* rigidly mounted in a perforation in one of the cross bars *o* of an open quadrantal ribbon-feed frame *p* secured rigidly at its end to the frame of the machine. This sleeve supports the lever arm through the medium of a duplex retaining pawl to be presently described, and a rigid collar *q* upon the upper end of the arbor adjacent to such lever arm, both the sleeve and collar acting as distance pieces to accommodate certain members of the improved ribbon gear. The opposite end of the lever arm *l* has a headed stud *r* upon its underside, the neck of which is straddled
75 by the forked end *s* of a longitudinally reciprocating and transversely oscillative slide bar *t* having a, preferably, rectangular loop *u* between its ends and adapted to be fitted over the arbor *m* and lie upon the duplex pawl and beneath the lever arm; while the other end of this slide bar is pivoted to the upper end of a vertical lever *v* the lower end whereof receives movement from the universal-bar rocker shaft *w* as usual
85 through an arm *x* upon and oscillating with the latter and a link *y* pivotally connected at its ends to the upper end of such arm and the lower end of the vertical lever.

The longitudinal sides of the loop *u* have depending rigid dogs 2, to in their reciprocation with the bar move back and forth at opposite sides of the arbor. Upon the guiding sleeve *n* is pivoted an arm 3 the hub whereof has a pair of rigid dogs 4 projecting radially from diametrically opposite sides thereof, and its end has a stud *r'*. One end of a retractile volutoid spring 5 is connected to the lower end of such stud, the other end thereof being connected, as at 6,
100 to the crotch of a duplex actuating pawl to be presently described, while the upper end of the stud engages a duplex retaining pawl to be presently described. This spring has

two bearing points one being upon the end of the arm 3 and the other at the crotch of the duplex actuating pawl and this form of spring is preferable because owing to its span, it will yieldingly retain the arm 3 at either side of its pivot point to which it may be moved and in conjunction with this arm, retain the actuating and retaining pawls in operative relation with either ribbon drum.

The duplex actuating pawl before mentioned is in the form of a Y having the end of its leg 7 notched and pivotally connected as at 8 to the vertical lever *v* a short distance below the top thereof, while its furcated end 9 is of a width to almost but not quite engage the ratchet toothed disks 10 of the ribbon drums, and it terminates in pawls 12 either of which is adapted to engage the toothed disk at its side upon being swung into engagement therewith. The duplex retaining pawl is in the form of an arc 13 having its ends 14 widened and in the form of pawls, the total length being substantially equal to the width of the furcated end of the duplex actuating pawl.

The function of this duplex retaining pawl is to prevent dragging of the ratchet toothed disks with the duplex actuating pawl during the latter's return movement and it is shown in plan in Fig. 1 and in transverse sectional view in Fig. 3. These duplex pawls are retained in operative relation with the ratchet toothed disks by a pair of bars 15 extending over the ends of such pawls and each connected at one end as at 16 to the usual quadrantal bar 17 which receives the impact of the return movement of the type bars, and at their other ends to a pair of standards 18 carried rigidly by the ribbon feed frame *p*, each of these bars 15 having an arm 19 extending laterally therefrom over such pawls.

The operation of the improved ribbon feed and automatic reverse is as follows: Each oscillation of the universal bar causes the slide bar *t* to reciprocate and the duplex actuating pawl to intermittently rotate the ribbon drum with which it happens to be in operative relation. When the ribbon is almost completely wound upon this drum, and commences to tighten, it will bear upon the bearing end of and move the bell crank-lever adjacent to the other drum, thereby drawing toward it (through the medium of its connecting link *i*) the lever arm *l* which, through its stud *r*, swings the forked end of the slide bar *t* with it, and brings the dog 2 on the opposite side of bar *t* into line with the rigid dog 4 adjacent thereto and upon arm 3. When the next stroke is given, whether upon the space bar or any one of the keys, and the bar *t* is, in sequence, reciprocated, the said dog 2 will impinge upon the dog 4 and swing such arm 3, against the yielding resistance of the retractile volutoid spring, from the side of the guiding sleeve

n, at which it may have been resting, to the other side thereof, thereby throwing the line of tension between the two bearing points of the spring to the said other side of the center (indicated by the sleeve *n*). The spring then under its retractile force, and through the medium of the stud *r'* which is then caused to bear upon the duplex retaining pawl, moves both pawls into operative engagement with the ratchet toothed plate of the other drum.

It is obvious that with the combination of parts just described, the ribbon gear is reversed by being first automatically arranged in position to be actuated by a minimum exertion of power of the ribbon feed, and then the reversal is actually due to an action performed by a manual effort.

This application is a divisional part of application No. 191,602. Filed by me February 1, 1904.

What I claim is as follows:

1. The combination with printing mechanism, of a pair of rotary drums adapted to have the ends of the ribbon connected thereto, a unitary member reciprocating with each action of the printing mechanism and adapted to directly engage and rotate either one of said drums, means normally out of engagement with and adapted to be actuated by the ribbon when the latter nears the end of the travel in one direction for shifting said unitary member from operative connection with one of said drums into operative connection with the other.

2. The combination with printing mechanism, of a pair of rotary drums adapted to have the ends of the ribbon connected thereto, a horizontal member reciprocating with each action of the printing mechanism and adapted to directly engage and rotate either one of said drums, such member being of less length in direct line between its ends than the distance between the drums, means actuated by the ribbon when the latter nears the end of the travel in one direction for shifting said horizontal member bodily from operative connection with one of said drums into operative connection with the other.

3. In a typewriting machine ribbon reversing mechanism including a member adapted to be moved by the ribbon when it becomes taut or begins to tighten, and a lever arm connected thereto and adapted to be moved thereby, a pivoted arm co-acting with the ribbon reversing mechanism; and a member adapted to engage with and move the pivoted arm after the movement of the lever arm.

4. The combination with a pair of ribbon drums, and a pair or ratchet toothed disks in operative relation with the drums of a drum rotating device, means slidably supporting the device adjacent to the disks, such device including means imparting vi-

bratory movement thereto transversely relatively to the ribbon and in a direction intersecting the plane in which the disks lie, and means for at times shifting the said device parallel to the said plane to bring the second mentioned means into operative relation with the drums alternately.

5. The combination with printing mechanism, of a ribbon feed consisting of a pair of rotary drums adapted to have the ends of the ribbon connected thereto, a furcated member arranged to slide at right angles to a line intersecting the axes of the drums and reciprocating with each action of the printing mechanism and adapted to rotate either one of said drums, and means whereby said furcated member is automatically shifted from operative connection with one of said drums into operative connection with the other for the purpose of reversing the direction of feed of the ribbon.

6. The combination of ribbon-carrying reels having opposed ratchet-wheels, a reciprocating furcated actuating pawl pivotally mounted and movable into engagement with either of said wheels such actuating pawl being of less length in direct line between its ends than the distance between the ratchet-wheels a pivotally mounted furcated restraining pawl movable into engagement with either of said wheels, and connections between said pawls causing the shifting of one to shift the other.

7. The combination of ribbon-carrying reels having opposed ratchet-wheels, a reciprocating furcated actuating pawl pivotally mounted and movable into engagement with either of said wheels, a pivotally mounted furcated restraining pawl movable into engagement with either of said wheels, connections between said pawls causing the shifting of one to shift the other, and means normally out of engagement with the ribbon for automatically reversing the pawls by the running out of the said ribbon.

8. The combination with printing mechanism, of a pair of rotatory ribbon drums adapted to have the ribbon connected thereto, and ratchet toothed disks in operative connection therewith of a member of less length in direct line between its ends than the distance between the disks, pawls at the opposite ends of such member, means actuated synchronously with each printing action for reciprocating the said member to and from operative relation with one of the disks, and means for at times shifting the said member from one disk to another such last mentioned means being normally out of engagement with the ribbon and adapted to be actuated thereby near the end of travel thereof.

9. The combination with printing mechanism, a ribbon carrier adapted to support and guide a ribbon across the printing point,

a part horizontally reciprocating with each action of the printing mechanism, and means for feeding the ribbon, such means operating in unison with the movable part, a lever intersecting the path of the ribbon and adapted to be moved by the ribbon when such ribbon tightens, and means, co-acting with said lever, for causing the said horizontally movable part to reverse the direction of the feed.

10. The combination with printing mechanism, and means whereby an inking ribbon is fed past the printing mechanism of a movable device located adjacent to such feeding means, a reciprocatory part distinct from the ribbon feeding means and actuated by the printing mechanism, an operative connection between such movable device and feeding means, whereby the movement of such movable device will reverse the feeding means, said reciprocatory part being adapted to at times engage and move said movable device, a lever actuated by the ribbon when it nears the completion of its travel in one direction, and means connecting such lever to said reciprocatory part, for the purpose set forth.

11. The combination with printing mechanism, of a platen, means whereby an inking ribbon is fed between the printing mechanism and the platen, such feeding means being reversible, of an oscillatory arm pivoted adjacent to such feed device, a reciprocatory part distinct from the ribbon feeding means and actuated by the printing mechanism and adapted to at times engage and swing the arm, an operative connection between the arm and feed device whereby the latter is reversed upon an engagement being effected between the movable part and the arm, a lever intersecting the path of the ribbon and adapted to be moved by the latter when it nears the end of its travel in one direction, and intermedial means actuated by said lever for causing said reciprocatory part to engage the arm.

12. The combination with printing mechanism, of a pair of rotatable drums located one at each side of such printing mechanism, a reciprocating pawl carrier, means operatively connecting the pawl carrier to the printing mechanism to be reciprocated with each action thereof, a movable part adapted when movement is imparted thereto to change the pawl carrier from rotative relation with one drum to the other, a laterally movable and longitudinally reciprocating slide bar actuated by such pawl carrier and adapted upon being moved from side to side to move the said movable part and cause same to shift the pawl carrier, a lever adapted to be moved by the ribbon when it nears the end of its travel, and means actuated by said lever for causing said slide bar to move laterally for the purpose set forth.

13. The combination with printing mechanism, of rotatable drums located one at each side of such printing mechanism, a pawl carrier, means operatively connecting such pawl carrier to printing mechanism to be reciprocated with each action thereof, a movable part adapted when movement is imparted thereto to change the pawl carrier from rotative relation with one drum to the other, a laterally movable and longitudinally reciprocating slide bar actuated by such pawl carrier and adapted upon being moved from side to side to move the said movable part to cause same to shift the pawl carrier, a bell-crank-lever fulcrumed adjacent to each drum having one of its arms adapted to intersect the path of the ribbon and be moved by the latter when it nears the end of its travel, and a pair of links connecting the other arms of such bell-crank-levers to the slide bar, for the purpose set forth.
14. The combination with printing mechanism, and a pair of rotatable drums located one at each side of such printing mechanism, of a reciprocating pawl carrier, means operatively connecting such pawl carrier to the printing mechanism to be reciprocated with each action thereof, a movable part adapted when movement is imparted thereto to change the pawl carrier from rotative relation with one drum to the other, a bar operatively connected to said pawl carrier to reciprocate simultaneously therewith and formed to engage and move said movable part when such bar is displaced laterally in either direction, an oscillatory lever arm having a sliding pivotal connection with said bar, a pair of bell-crank-levers one located adjacent to each drum and each having one of its arms adapted to intersect the path of the ribbon and be moved thereby when it nears the end of its travel, and a pair of links connecting the other arms of such bell-crank-levers to said oscillatory lever arm for the purpose of transmitting the movement of said bell-crank-levers to the reciprocating bar.
15. The combination with printing mechanism, and a pair of rotatable drums located one at each side of such printing mechanism, of a reciprocating pawl carrier, means operatively connecting such pawl carrier to the printing mechanism to be reciprocated with each action thereof; means yieldingly retaining said pawl carrier in the position to which it is moved, a movable part adapted when movement is imparted thereto to change the pawl carrier from rotative relation with one drum to the other, a bar operatively connected to said pawl carrier to reciprocate simultaneously therewith and formed to engage and move said movable part when such bar is displaced laterally in either direction, an oscillatory lever arm having a sliding pivotal connection with said bar, a pair of bell-crank-levers one located adjacent to each drum and each having one of its arms adapted to intersect the path of the ribbon and be moved thereby when it nears the end of its travel, and a pair of links connecting the other arms of such bell-crank-levers to said oscillatory lever arm for the purpose of transmitting the movement of said bell-crank-levers to the bar.
16. The combination with printing mechanism, and a pair of rotatable drums located one at each side of such printing mechanism, of a reciprocating pawl carrier, means operatively connecting such pawl carrier to the printing mechanism to be reciprocated with each action thereof, a retaining pawl adapted to retain either drum in any position to which it may be rotated, a movable part adapted when movement is imparted thereto to change the pawl from rotative relation with one drum to the other, a bar operatively connected to said pawl carrier to reciprocate simultaneously therewith and formed to engage and move said movable part when such bar is displaced laterally in either direction, an oscillatory lever arm having a sliding pivotal connection with said bar, a pair of bell-crank-levers one located adjacent to each drum and each having one of its arms adapted to intersect the path of the ribbon and be moved thereby when it nears the end of its travel, and a pair of links connecting the other arms of such bell-crank-levers to said oscillatory lever arm for the purpose of transmitting the movement of said bell-crank-levers to the bar.
17. The combination with printing mechanism, and a pair of rotatable drums located one at each side of such printing mechanism, of a reciprocating pawl carrier, means operatively connecting the pawl carrier to the printing mechanism to be reciprocated with each action thereof, a retaining pawl adapted to retain either drum in any position to which it may be rotated, means yieldingly retaining said pawl carrier in the position to which it may be moved, a movable part adapted when movement is imparted thereto to change the pawl carrier from rotative relation with one drum to the other, a bar operatively connected to said pawl carrier to reciprocate simultaneously therewith and formed to engage and move said movable part when such bar is displaced laterally in either direction, an oscillatory lever arm having a sliding pivotal connection with said bar, a pair of bell-crank-levers one located adjacent to each drum and each having one of its arms adapted to intersect the path of the ribbon and be moved thereby when it nears the end of its travel, and a pair of links connecting the other arms of such bell-crank-levers to said oscillatory lever arm for the purpose of transmitting the movement of said bell-crank-levers to the bar.

lever arm for the purpose of transmitting the movement of said bell-crank-lever to the bar.

18. The combination with printing mechanism, and a pair of rotatable drums located one at each side of such printing mechanism, of a reciprocating duplex pawl carrier, means operatively connecting such pawl carrier to the printing mechanism whereby such pawl carrier will reciprocate upon each action of the printing mechanism, a duplex retaining pawl adapted to retain either drum in any position to which it may be rotated, a movable part adapted when movement is imparted thereto to change the pawl carrier from rotative relation with one drum to the other, a bar operatively connected to said pawl carrier to reciprocate simultaneously therewith and formed to engage and move said movable part when such bar is displaced laterally in either direction, an oscillatory lever arm having a sliding pivotal connection with said bar, a pair of bell-crank-levers one located adjacent to each drum and each having one of its arms adapted to intersect the path of the ribbon and be moved thereby when it nears the end of its travel, and a pair of links connecting the other arms of such bell-crank-levers to said oscillatory lever arm for the purpose of transmitting the movement of said bell-crank-levers to the bar.

19. The combination with printing mechanism, a pair of rotatable drums located one at each side of said printing mechanism and adapted to have the ends of an inking ribbon connected thereto, a part of each drum being circular and having ratchet teeth formed in its periphery, and means for guiding said ribbon between the printing mechanism and the platen, of a reciprocatory carrier, means operatively connecting such carrier to the printing mechanism to be reciprocated with each action of such printing mechanism, a duplex furcated pawl carried by the carrier and adapted to be moved into rotative connection with the ratchet teeth of either drum, an oscillatory arm pivoted independently of the said carrier and the pawl carried thereby, said oscillatory arm having a pair of radially projecting rigid dogs thereon one at each side of the pivot point, a bow-spring connected at one end to the end of such oscillatory arm and at its other end to such pawl at the crotch thereof, a reciprocatory bar operatively connected to said carrier to reciprocate simultaneously therewith and extending over said oscillatory arm, such bar having a pair of downward projections located one at each side thereof and a distance apart slightly greater than the length between the ends of said rigid dogs upon the oscillatory arm, a member intersecting the path of the ribbon and adapted to be moved thereby when it nears the end of

its travel, and means operatively connecting such last mentioned member to the said bar for the purpose of causing the movement of the member to move the bar laterally, substantially as described.

20. The combination with printing mechanism, a pair of rotatable drums located one at each side of said printing mechanism, a part of each drum being circular and having ratchet teeth formed in its periphery, and means for guiding said ribbon, of a reciprocatory carrier, means operatively connecting such carrier to the printing mechanism, to be reciprocated with each action of such printing mechanism, a duplex furcated pawl carried by such carrier and adapted to be moved into rotative connection with the ratchet teeth of either drum, an oscillatory arm pivoted independently of the pawl carrier and the pawl carried thereby, said oscillatory arm having a pair of radially projecting rigid dogs thereon one at each side of the pivot point, a bow-spring connected at one end to the end of such oscillatory arm and at its other end to such pawl at the crotch thereof, a second reciprocatory bar operatively connected to the said pawl carrier to reciprocate simultaneously therewith and extending over said oscillatory arm, such bar having a pair of downward projections located one at each side thereof and a distance apart slightly greater than the length between the ends of said rigid dogs, an oscillatory lever arm having a sliding pivotal connection with said bar, a pair of bell-crank-levers one located adjacent to each drum and each having one of its arms adapted to intersect the path of the ribbon and be moved thereby when it nears the end of its travel, and a pair of links connecting the other arms of such bell-crank-levers to said oscillatory lever arm for the purpose of causing the movement of the member to move said bar laterally substantially as described.

21. In a type writer the combination with the frame thereof, printing mechanism carried by such frame and including a universal member operatively connected to the printing mechanism and moved by each action of the latter and a pair of rotatable drums located one at each side of said printing mechanism, of a horizontal rearwardly extending reciprocatory carrier, a vertical lever pivoted between its ends to the frame of the machine and having the front of such carrier pivotally connected thereto a short distance below the upper end thereof, means operatively connecting the lower end of such vertical lever to such universal member, a duplex furcated pawl carried by such carrier and adapted to be moved into rotative connection with the ratchet teeth of either drum, an oscillatory arm pivoted to the frame of the machine and having a pair

of radially projecting rigid dogs thereon one at each side of the pivot point and a vertically projecting stud at its free end, a bow-spring connected at one end to the said stud and at its other end to such pawl at the crotch thereof, a reciprocatory bar extending above and parallel to said pawl carrier and over said oscillatory arm, such bar being laterally movable pivotally connected at one end to the upper end of said vertical lever and having its opposite end forked and a portion between its ends widened and formed with an opening, a pair of downwardly projecting lugs one upon each side of said widened portion, a second oscillatory arm located above said bar and pivoted coaxially with but independently of the first mentioned oscillatory arm and having a downwardly projecting stud engaging the forked end of the reciprocatory bar, a pair of bell-crank-levers one located adjacent to each drum and each having one of its arms adapted to intersect the path of the ribbon and be moved thereby when it nears the end of its travel, and a pair of links connecting the other arms of such bell-crank-levers to said last mentioned oscillatory lever arm for the purpose of causing the movement of the member to move said bar laterally, substantially as described.

22. In a type writer the combination with the frame and universal bar thereof, printing mechanism carried by such frame and a pair of rotatable ribbon drums located one at each side of said printing mechanism, a part of each drum being circular and having ratchet teeth formed in its periphery, of a horizontal rearwardly extending reciprocatory carrier, a vertical lever pivoted between its ends to the frame of the machine and having the front of such rearwardly extending bar pivotally connected thereto a short distance below the upper end thereof, means operatively connecting the lower end of such vertical lever to the universal bar,

a duplex furcated pawl carried by such carrier and adapted to be moved into rotative connection with the ratchet teeth of either drum, an oscillatory arm pivoted to the frame of the machine and having a pair of radially projecting rigid dogs thereon one at each side of the pivot point and a vertically projecting stud at its free end, a duplex retaining pawl pivoted midway of its length to the said oscillatory arm adjacent to said stud, a bow-spring connected at one end to the said stud and at its other end to such pawl at the crotch thereof, a reciprocatory bar extending above and parallel to the carrier and over said oscillatory arm, such bar being laterally movably pivotally connected at one end to the upper end of said vertical lever and having its opposite end forked and a portion between its ends widened and formed with an opening, a pair of downwardly projecting lugs one upon each side of said widened portion, a second oscillatory arm located above said bar and pivoted coaxially with but independently of the first mentioned oscillatory arm and having a downwardly projecting stud engaging the forked end of the said reciprocatory bar, a pair of bell-crank-levers one located adjacent to each drum and each having one of its arms adapted to intersect the path of the ribbon and be moved thereby when it nears the end of its travel, and a pair of links connecting the other arms of such bell-crank-levers to said last mentioned oscillatory lever arm for the purpose of causing the movement of the member to move said bar laterally, substantially as described.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

WELLINGTON PARKER KIDDER.

Witnesses:

M. E. KIRBY,
J. J. KENNEDY.