

J. ALEXANDER.
TYPE WRITER RIBBON OPERATING MECHANISM.

APPLICATION FILED DEC. 1, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

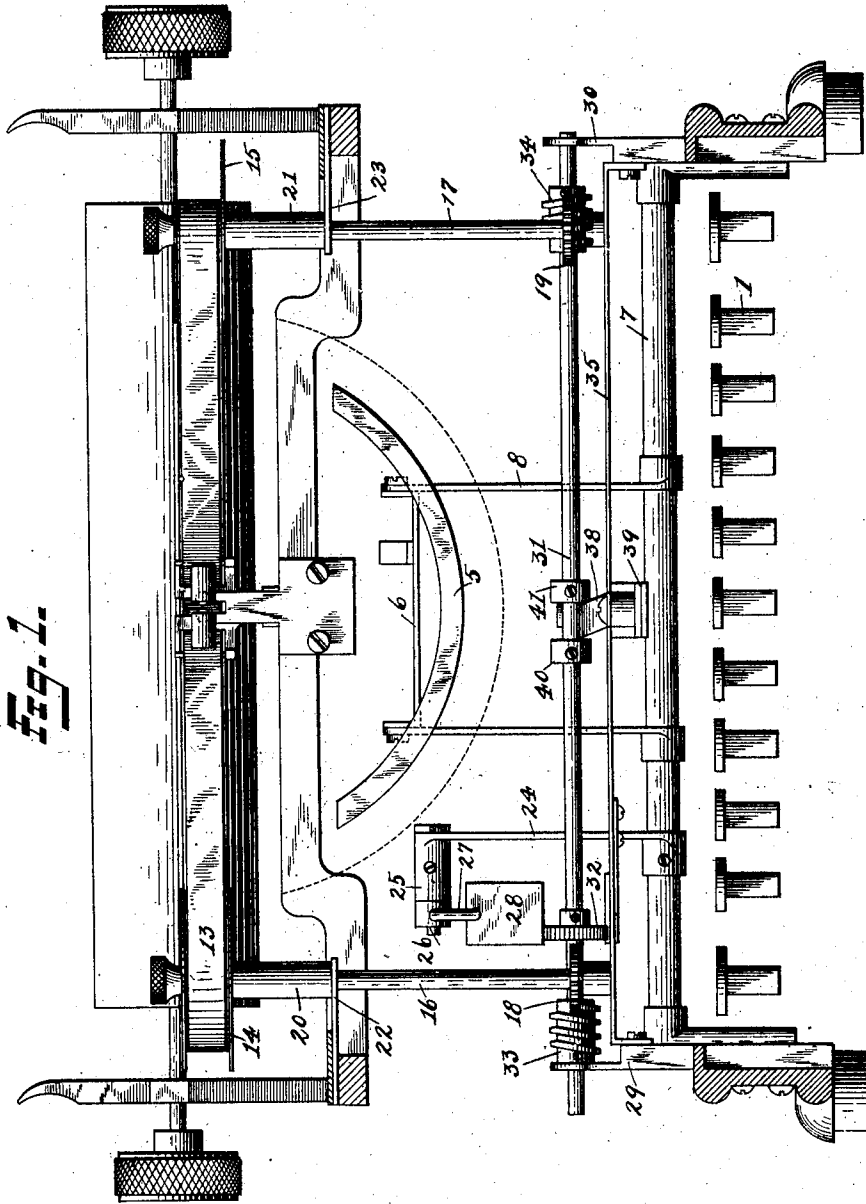


Fig. 1.

Witnesses

J. M. Givv.
Geo. V. Roamussen

Inventor
Jesse Alexander

By R. Mitchell.
Attorney

No. 761,807.

PATENTED JUNE 7, 1904.

J. ALEXANDER.
TYPE WRITER RIBBON OPERATING MECHANISM.

APPLICATION FILED DEC. 1, 1902.

NO MODEL.

3 SHEETS—SHEET 2.

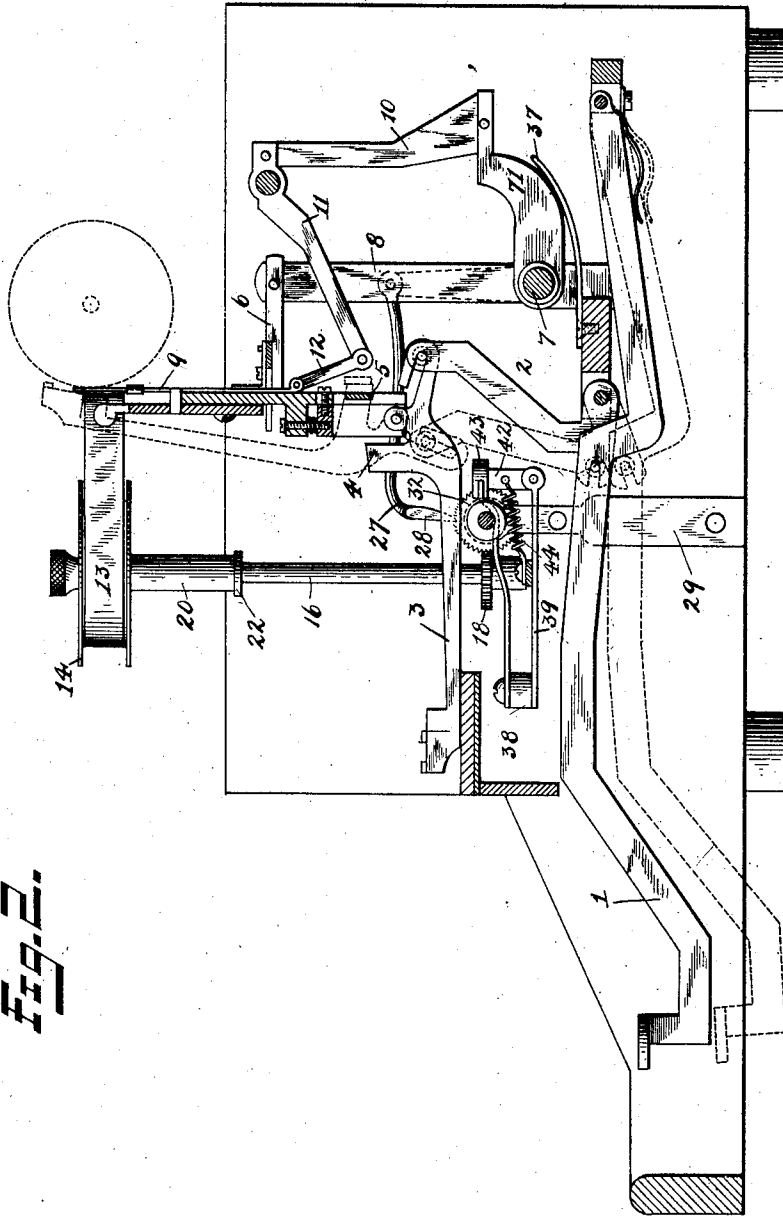


Fig. 2.

Witnesses
J. B. McGivver
Geo. V. Rasmussen

Inventor:
Jesse Alexander
By *R. C. Hutchell*
Attorney

UNITED STATES PATENT OFFICE.

JESSE ALEXANDER, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF TO ERIC NILSON, OF NEW YORK, N. Y., AND JULIUS AUGUST LA-FRENTZ, OF BROOKLYN, NEW YORK.

TYPE-WRITER-RIBBON-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 761,807, dated June 7, 1904.

Application filed December 1, 1902. Serial No. 133,432. (No model.)

To all whom it may concern:

Be it known that I, JESSE ALEXANDER, a citizen of the United States, residing at Brooklyn, in the county of Kings, State of New York, have invented certain new and useful Improvements in Type - Writer - Ribbon - Operating Mechanism, of which the following is a full, clear, and exact description.

My invention relates to type-writers, and particularly to mechanism for moving the ribbon before the printing position of the type.

It is the object of my invention to provide a ribbon mechanism which will be operated when the type are moved to the printing position and in which the movement of the ribbon will be reversed automatically when the ribbon has been entirely wound at one side or the other of the machine. This mechanism operates with the expenditure of but little energy and in such a manner as to be positive and certain at all times. The reversal of movement of the ribbon is effected in a simple manner and without the aid of any manual movement other than that required to ordinarily depress the keys in printing. The mechanism for accomplishing this is simple and not at all likely to be thrown out of order by the ordinary use of the machine.

The improvements will be found to consist in the structure hereinafter described and as shown in the accompanying drawings.

Figure 1 is a front elevation of the parts of a type-writer embodying a ribbon mechanism of my invention. Fig. 2 is a side elevation and partial cross-section of a structure embodying my improvements. Fig. 3 is a plan view of parts of the principal features of my improvements, certain parts being broken away. Fig. 4 is a detail sectional plan of a ribbon-spool. Fig. 5 is a side elevation of the same detail. Fig. 6 is a view of a clamping-plate for the ribbon-spool.

The depression of an ordinary key-bar 1 operates through the pivoted link 2 the pivoted type-bar 3. A shoulder 4, carried by the type-bar when it is raised to the position shown dotted in Fig. 2, strikes against the universal bar 5 and causes this to be moved to the rear.

From the rear of the universal bar projects the frame 6. I have termed the shaft 7 the "universal" shaft, since it is operated by means of the universal bar 5 and frame 6 through the arm 8 and may be operated by any one of the series of type-bars of the machine. The universal shaft 7 is pivoted in suitable bearings in the sides of the machine. Whenever the universal shaft is rocked by means of the type-bars, the ribbon-carrying frame 9 is raised by means of the connecting parts, link 10, pivoted lever 11, and the short link 12. The ribbon is thus raised from its normal position, as shown in Fig. 2, up to a point so that the ribbon will be between the face of the type and the platen when the type is raised to the printing position. In the normal position the printed line upon the paper, which is carried by the platen, appears before the view of the operator, and the ribbon is only raised and obscures the printing at the instant when the type is about to print. The ribbon 13 is wound upon the two spools 14 and 15 at the left and right hand of the machine, respectively. These spools are mounted upon vertical shafts 16 and 17, carrying at their lower ends the gears 18 and 19, respectively. These shafts have suitable collars 20 and 21, which rest upon supporting members 22 and 23, carried by the frame of the machine.

The universal shaft 7 has at one side of the machine an arm 24, which at its upper end has a bushing 25, furnishing a bearing for the short shaft 26. Upon this shaft is pivoted the pawl-arm 27.

The posts 29 and 30, which are secured to the side frames of the machine, furnish suitable bearings for the longitudinally-movable and rotatable shaft 31. This shaft 31, which I will term the "shifting-shaft," carries a ratchet-wheel 32, which is adapted to be engaged by the pawl 28. On this shifting-shaft 31 are secured the worm-wheels 33 and 34, which are adapted when in their proper positions to engage, respectively, with the gears 18 or 19, carried by the ribbon-spool shafts 16 and 17. The bar 35 at its two ends fur-

nishes suitable bearings for the ribbon-carrying shafts 16 and 17.

36 is a brake or holding-pawl, which in the form shown is mounted upon the under side of the bar 35 and engages with the ratchet 32 to prevent the same from moving backwardly.

When the type-bar is raised by the operation of a key and the universal shaft 7 is rocked, the pawl-arm 27 is carried to the rear and the pawl 28 slips over a tooth on the ratchet 32, the ratchet being held stationary during this operation by means of the holding-pawl 36. When the type-bar is released, the spring 37, acting upon the arm 71, rotates the universal shaft 7 back to its original position, and thus moves the pawl 28 back to its original position. By this action the ratchet 32 is revolved a corresponding distance anticlockwise, as viewed in Fig. 2 or as shown by the arrow in Fig. 3. The rotation of the ratchet 32 rotates the shifting-shaft 31 similarly and by means of the worm 34 rotates the ribbon-shaft 17 in the direction shown by the arrow in Fig. 3, thus winding the ribbon 13 onto the spool 15 on the right-hand ribbon-spool shaft 17. At this time the worm 33 is out of engagement with the teeth of the gear 18, so that the ribbon is free to be drawn off from the left-hand ribbon-spool 14. When this operation has been continued until end of the ribbon 13 on the spool 14 is reached, the continued rotation of the worm 34 tends to continue to rotate the gear 19, as shown by the arrow in Fig. 3. The left-hand end of the ribbon being secured to the spool 14, as soon as the ribbon 13 becomes taut it is impossible for the gear 19 to continue to rotate. The result is that the continued rotation of the worm 34 causes the worm to move to the right, carrying with it the shifting-shaft 31, since the gear 19 is stationary. It will thus be seen that the worm acts as a screw moving into a stationary tapped hole. As soon as the spiral on the worm 34 becomes freed from the teeth of the gear 19 the spiral of the worm 33 will begin to take into the teeth of the gear 18, as shown in the dotted position in Fig. 3. The continued rotation of the shifting-shaft 31 by means of the pawl 28 will therefore cause the gear 18 and shaft 16 to revolve, so as to wind the ribbon upon ribbon-spool 14. For this purpose the worm 33 is formed with a left-hand spiral, whereas the worm 34 has a right-hand spiral. To facilitate this shifting of the shaft 31 over the central position, I have provided the jumping arm 38. This arm is pivoted to a plate 39, carried by the rod 35. The shifting-shaft 31 carries two lugs 40 and 41, with either one of which the jumping arm 38 may engage when in its proper position. At the rear of the plate 39 is pivoted an arm 42, carrying the wheel 43. The arm 42 and wheel 43 are held in their normal position, as seen particularly in Fig. 2, by means of a helical spring

44. In the position shown in Fig. 3 the wheel 43 is drawn down by the spring 44, so as to contact with the right-hand face of the end of the jumping arm 38. The spring 34 therefore causing the wheel 43 to press against this face gives the arm 38 a pressure toward the left, so that the arm presses in its turn against the stop 40 and holds the shifting-shaft 31 in the position shown in Fig. 3. When the left-hand end of the ribbon is reached and the shaft 31 begins to shift toward the position shown dotted in Fig. 3 and the stop 40 moves toward the right, the arm 38 is gradually turned upon its pivot and causes the pressing-wheel 43 to be moved outwardly on the cam-like surface at the end of the arm. As soon as this action has moved the pressing-wheel 43 to the extreme outer end of the arm 38 the action of the helical spring 44 draws the presser-wheel 43 back again, and riding down the cam-like left-hand face of the end of the arm 38 moves the arm to the right, and thus assists to shift the shaft 31 to the position shown dotted in Fig. 3, with the worm 34 resting against the bearing 30, which acts as a stop. The action is of course similar, but in a reverse direction, when the ribbon is being wound upon the left-hand wheel, and the right-hand end of the ribbon causes the shifting-shaft and worm-wheels 33 and 34 to be thrown back again to the position shown in full lines in Fig. 3, where the bearing 29 acts as a stop for the worm 33.

The ends of the ribbon 13 must of course be secured to the ribbon-spools 14 and 15 in a manner so that some little strain may be brought to bear upon the ribbon. In the particular construction herein shown, as in Figs. 4 and 5, a toothed plate 141 is pivoted in the hub 142 of the spool 14 and is adapted to hold the left-hand end of the ribbon 13. The plate 141 is formed, as shown in Fig. 6, with its ends as pivots. The construction of the right-hand ribbon-spool 15 of course would be similar, except that the position of the teeth on the holding-plate would be in a reverse direction.

What I claim is—

1. A ribbon movement for a type-writing machine including a universal rock-shaft, a pawl-arm and pawl operated thereby, a rotatable and longitudinally-movable shifting-shaft, a ratchet carried thereby engaged by said pawl, worm-wheels carried thereby, ribbon-spool shafts, and gears carried by said spool-shafts adapted to be engaged by said worms and stationary bearings for said shifting-shaft whereby when one ribbon-shaft is held stationary the shifting-shaft will move longitudinally so as to reverse the movement of the ribbon.

2. A ribbon movement for a type-writing machine including a universal rock-shaft, a pawl-arm and pawl operated thereby, a rotatable and longitudinally-movable shifting-shaft, a ratchet carried thereby engaged by said

pawl, worm-wheels carried thereby, ribbon-spool shafts, gears carried by said spool-shafts adapted to be engaged by said worms; and means for automatically drawing one worm longitudinally into engagement with a gear and disengaging the other worm from its corresponding gear.

3. A ribbon-operating mechanism for a type-writer including a pair of ribbon-spool-carrying shafts, gears carried by said shafts, a rotatable and longitudinally-movable shifting-shaft, means for rotating said shaft, worms carried by said shaft, means for automatically causing said worms to move longitudinally when their gears are held stationary, engaging and disengaging said worms with and from their corresponding gears.

4. A ribbon-operating mechanism for a type-writer including a pair of ribbon-spool-carrying shafts, gears carried by said shafts, a rotatable and longitudinally-movable shifting-shaft, worms carried by said shaft for engaging said gears, means for automatically moving said shifting-shaft longitudinally for engaging and disengaging said worms with and from their corresponding gears, and spring-controlled means for assisting in the shifting movement of the shaft and gears all whereby the shifting-shaft is brought into operative engagement with the ribbon-spool-carrying shaft, the instant the worm on the shifting-shaft contacts with its gear.

5. A ribbon-operating mechanism for a type-writer including a pair of ribbon-spool-carrying shafts, gears carried by said shafts, a rotatable and longitudinally-movable shifting-shaft, worms carried by said shaft, means for automatically engaging and disengaging said worms with and from their corresponding gears, a pivoted arm, stops carried by said shaft, said arm being adapted to coact with one or the other of said stops, a spring-pressed means adapted to coact with the end of said arm whereby the automatic action of said shifting-shaft may be supplemented.

6. A ribbon movement for type-writing machines including a rotatable and longitudinally-movable shifting-shaft and means for operating the same, worm-gears carried by said shaft, ribbon-spool-carrying shafts, gears carried by said spool-carrying shafts, a rod forming the lower end bearings for said shafts, a ratchet-wheel carried by said shifting-shaft, and a breaking-pawl carried by said rod engaging said ratchet.

7. A ribbon movement for type-writing machines including a rotatable and longitudinally-movable shifting-shaft and means for operating the same, worm-gears carried by said shaft, ribbon-spool-carrying shafts, gears carried by said spool-carrying shafts, a rod forming the lower end bearings for said shafts, a ratchet-wheel carried by said shifting-shaft, a breaking-pawl carried by said rod, a pivoted arm carried by said rod, stops carried

by said shifting-shaft and a spring-pressed roller coacting with the end of said arm for the purpose specified.

8. A ribbon-operating mechanism for a type-writer including a universal shaft, a pivoted pawl-arm carried thereby, a shifting-shaft, a ratchet carried by said shifting-shaft, a pawl carried by said pawl-arm adapted to engage said ratchet, worm-gears carried by said shifting-shaft, bearings at either side of the frame of the machine for said shifting-shaft, a pair of vertical shafts, ribbon-spools carried by the upper ends thereof, gears carried by the lower ends of said shafts, said parts being so related that the movement of the ribbon will automatically shift said shaft, so that one worm-wheel will be disengaged from the gear of the shaft from which the ribbon is being unwound and the other worm-wheel will be thrown into engagement with its corresponding gear.

9. A ribbon-operating mechanism for a type-writer including a universal shaft, a pivoted pawl-arm carried thereby, a shifting-shaft, a ratchet carried by said shifting-shaft, a pawl carried by said pawl-arm adapted to engage said ratchet, worm-gears carried by said shifting-shaft, bearings at either side of the frame of the machine for said shifting-shaft, a pair of vertical shafts, ribbon-spools carried by the upper ends thereof, gears carried by the lower ends of said shafts, said parts being so related that the movement of the ribbon will automatically shift said shaft so that one worm-wheel will be disengaged from the gear on the shaft from which the ribbon is being unwound and the other worm-wheel will be thrown into engagement with its corresponding gear, and a spring-pressed means to supplement said shifting action.

10. A ribbon-operating mechanism for a type-writer including a universal shaft, a pivoted pawl-arm carried thereby, a shifting-shaft, a ratchet carried by said shifting-shaft, a pawl carried by said pawl-arm adapted to engage said ratchet, worm-gears carried by said shifting-shaft, bearings at either side of the frame of the machine for said shifting-shaft, a pair of vertical shafts, ribbon-spools carried by the upper ends thereof, gears carried by the lower ends of said shafts, said parts being so related that the movement of the ribbon will automatically shift said shaft, so that one worm-wheel will be disengaged from the gear of the shaft from which the ribbon is being unwound and the other worm-wheel will be thrown into engagement with its corresponding gear, stops carried by said shifting-shaft, a pivoted arm adapted to coact therewith, its outer end being formed into two cam-faces, a spring-pressed roller adapted to engage with one or the other of said cam-faces.

11. A ribbon-operating mechanism for a type-writer including a universal shaft, a pivoted

oted pawl-arm carried thereby, a shifting-
shaft, a ratchet carried by said shifting-shaft,
a pawl carried by said pawl-arm adapted to
engage said ratchet, worm-gears carried by
5 said shifting-shaft, bearings at either side of
the frame of the machine for said shifting-
shaft, a pair of vertical shafts, ribbon-spools
carried by the upper ends thereof, gears car-
ried by the lower ends of said shafts, said
10 parts being so related that the movement of
the ribbon will automatically shift said shaft,
so that one worm-wheel will be disengaged

from the gear of the shaft from which the
ribbon is being unwound and the other worm-
wheel will be thrown into engagement with 15
its corresponding gear, a pivoted arm, a roller
pivotaly and rotatably mounted, a spring for
pressing the roller into engagement with the
end of said arm whereby the movement of
said shifting-shaft may be supplemented.

JESSE ALEXANDER.

Witnesses:

L. VREELAND,
R. S. ALLYN.