Feb. 19, 1929. 1,702,938

M. GARBELL

RIBBON SHIFT FOR TYPEWRITERS

Filed Sept. 4, 1924 2 Sheets-Sheet 1

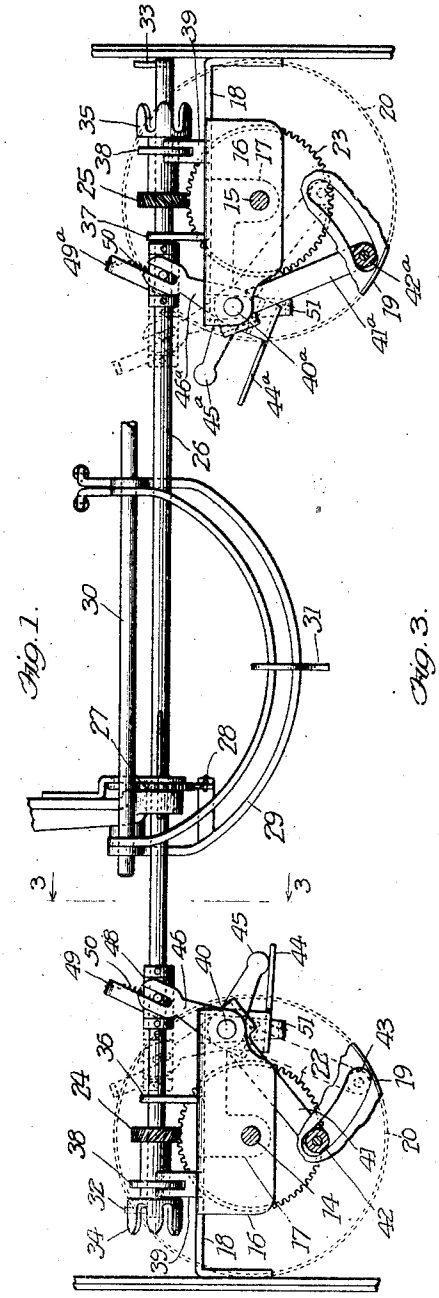

Fig. 1.

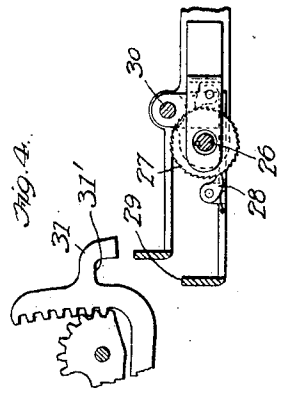

Fig. 4.

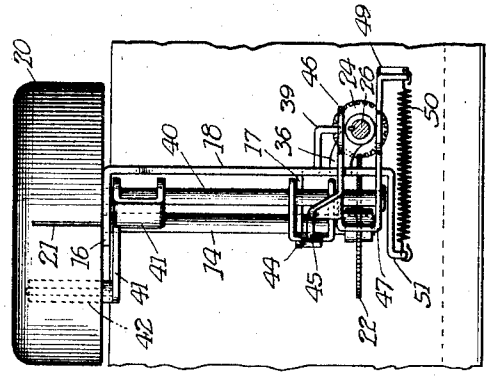

Fig. 3.

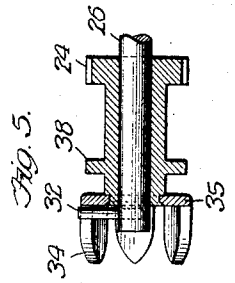

Fig. 5.

Witness
Martin H. Olsen

Inventor
Max Garbell
By Chas. C. Tillman
Atty

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M. GARBELL

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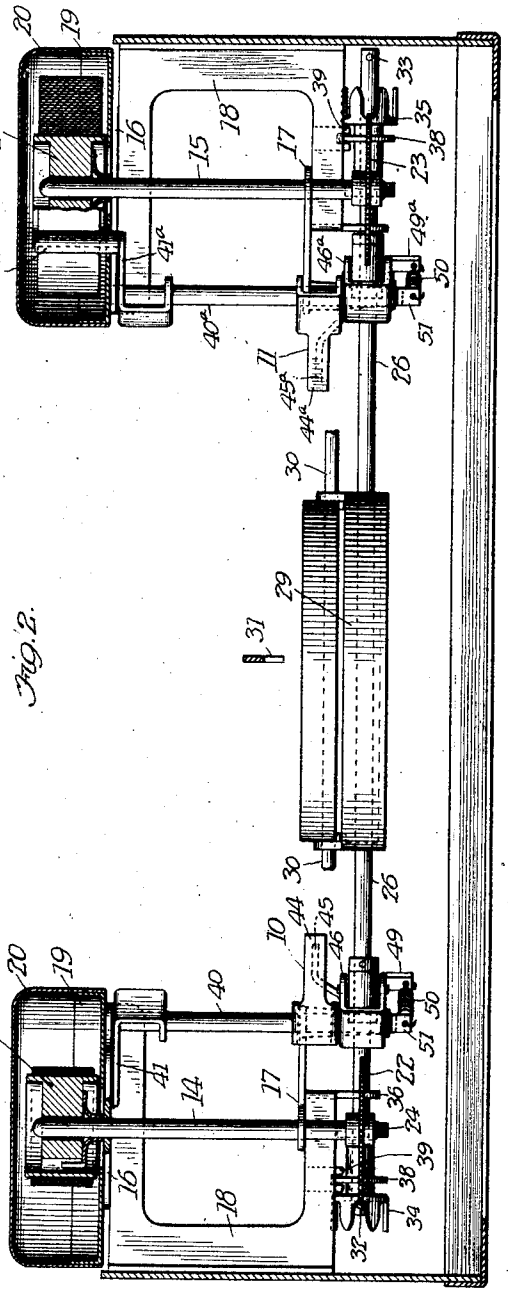

Fig. 2.

Witness
Martin H. Olsen.

Inventor
Max Garbell
By Chas. P. Tillman
Atty.

Patented Feb. 19, 1929. 1,702,938

UNITED STATES PATENT OFFICE.

MAX GARBELL, OF CHICAGO, ILLINOIS, ASSIGNOR TO VICTOR ADDING MACHINE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

RIBBON SHIFT FOR TYPEWRITERS.

Application filed September 4, 1924. Serial No. 735,806.

The invention relates to improvements in ribbon shifts for typewriters.

The invention has as its prime object the provision of a simple construction whereby the ribbon is moved a predetermined distance upon each actuation of a type bar lever and wound upon one spool and unwound from another, having combined therewith a mechanism which is automatically operable at a predetermined period to cause the direction of travel of the ribbon to be reversed and permitted to be moved in this last mentioned direction until a certain amount of ribbon is wound upon the other of said ribbon spools at which time the mechanism is again actuated to cause the ribbon to move in the first mentioned direction.

It is a feature of the invention to provide a mechanism operable in the manner above described which is controlled by the diameter or amount of ribbon wound upon either of said ribbon spools.

It is an additional object of the invention to provide a construction in which one mechanism is set by the other upon the actuation of the former, to permit the ribbon to be moved upon the action of the type bars and also set so that it may be actuated to cause the ribbon to travel in the reverse direction after a predetermined amount of ribbon has been wound upon the respective ribbon spools.

The invention has these and other objects all of which will be explained and more readily understood when read in conjunction with the accompanying drawings which illustrate one embodiment of which the invention is susceptible, it being obvious, however, that changes and modifications may be resorted to without departing from the spirit of the appended claims forming a part hereof.

In the drawings,—

Fig. 1 is a plan view illustrating the ribbon shift mechanism forming the basis of this application.

Fig. 2 is a sectional view of a typewriter frame showing the mechanism illustrated in Fig. 1 in elevation, parts being shown in section for the purpose of illustration.

Fig. 3 is a section taken on line 3—3 of Fig. 1.

Fig. 4 is a sectional view of a part of the structure shown in Figs. 1 and 2, and

Fig. 5 is a sectional view of the detail of construction.

The structure illustrated contemplates the provision of mechanisms generally designated 10 and 11 which are associated with each of the ribbon spools 12 and 13. These ribbon spools are each removably mounted upon an end of shafts respectively designated 14 and 15 which are respectively journaled in portions 16 and 17 which extend from a main frame 18. The spools 12 and 13 are each enclosed in a casing composed of a part 19 and a cap 20 the latter of which is removable to allow the insertion and removal of a new ribbon when this is found necessary or desirable. The cap portion of the casing is provided with a slot 21 through which the ribbon is passed so that it may travel from one spool to the other during the writing operation.

The lower end of each of the shafts 14 and 15 are respectively provided with a worm wheel designated 22 and 23, which respectively engage with the worms 24 and 25 mounted upon the shaft 26, the latter being rotated through the medium of the ratchet 27 and the pawl 28, the pawl being mounted upon a movable segmental bar 29 which in the present instance is pivotally secured to a bar or shaft 30. The bar 29 is designed to be actuated by a lever 31, the portion 31^1 thereof engaging the bar 29 to move it downwardly when said lever 31 is depressed. This downward movement is transmitted to the gear 27 through the medium of the pawl 28 which causes a partial rotation of the shaft 26, which is movable endwise independently of said ratchet. The shaft 26 has its opposite ends provided with pins or extensions 32 and 33 which are designed to alternately cooperate with clutch elements 34 and 35 which are respectively connected with the worm wheels 24 and 25.

When the pin 32 is in engagement with its respective clutch element such as 34, it is manifest that the rotation of the shaft 26 will be transmitted to the worm wheel 22, which will cause the rotation of the shaft 14 and the consequent winding of the ribbon upon the spool 12. This shaft 26 is rotatably and slidably mounted in bearings 36 and 37 which project from and may be a part of the main frame or supports 18. The clutch elements and the worms are as before stated connected together so as to rotate with each other and are each provided with a collar 38 which rotates in the element 39 and thus holds the clutch and worm in its proper relation with respect to its particular worm wheel.

The construction just referred to is mounted upon a shaft 40 which is mounted for rotation in the portions 16 and 17 of the main frame 18. The upper end of this shaft is provided with an arm 41 which is secured to the shaft so that they will rotate in unison with each other. The arm 41 has a vertically arranged roller 42 secured to it which extends upwardly through the portion 19 of the ribbon casing, it being designed to operate in a slot 43 provided in said portion 19 and to engage the ribbon as it is wound upon the ribbon roll 12. An arm 44 is also secured to the shaft 40 adjacent the lower end thereof, it being provided for the purpose of engaging with the arm 45 which is part of a forked lever 46 loosely mounted upon said shaft and includes the U-shaped portion 47 as clearly shown in Fig. 3. The lever 46 engages an element 48 which is secured to the shaft 26 for rotation with respect to the shaft. The lower portion of the forked arm 46 has an extension 49 to which one end of a coil spring 50 is secured. The opposite end of the coil spring 50 is attached to a stationary arm 51 which may be as in the present instance, a part of the main frame or support 18.

By referring to Fig. 1, it will be manifest that as the ribbon roll is rotated through the action of the lever 31 and its co-operating mechanism and the ribbon wound thereon, the diameter of the roll increases, and by virtue of the contact between the roll and the portion 42 of the arm 41, said arm will be moved in a counter-clockwise direction causing the arm 44 to engage with the arm 45 which will thus move the forked arm 46 in synchronism with it. This gradual counter-clockwise movement of these portions causes a longitudinal or endwise movement of the shaft 26, thereby moving the pin such as 32 outwardly with respect to the clutch element 34. The pin 32, however, will not be completely disengaged from the clutch such as 34 until the arm 47 has been moved beyond the center of the shaft 40, at which time the coil spring 50 is brought into operation causing the arm 49, the portion 48, and the shaft 26 to be quickly moved to cause the complete disengagement of the pin 32 and the clutch element such as 34, as shown in dotted lines in Fig. 1. This movement of the shaft 26 causes the pin 33 to engage with its respective clutch element 35 and thus as the bar 29 is actuated, the worm 25 and the worm wheel 23 will be rotated causing the ribbon to be wound upon the ribbon roll 13 mounted upon the upper end of the shaft 15. When the shaft 26 is moved to cause the pin 33 to engage with the clutch 35, the arm 44^a and its associated mechanism will be moved in a counter-clockwise direction as shown in dotted lines, bringing the arm 45^a into contact with the arm 44^a causing the arm 41^a and the roller 42^a thereof to be moved inwardly towards the shaft 15 so that it will be in a position to engage the ribbon as it is wound upon the spool mounted upon this shaft 15. It is evident that as the diameter of the roll 13 increases, the arm 41^a will be moved outwardly with respect to the ribbon roll, which consequently moves the arm 46^a and the shaft 26 as the diameter of the roll increases. When the arm 49^a assumes a position slightly to the right of the shaft 40^a as viewed in Figure 1, the operation of the parts as explained in conjunction with similar parts connected with the shaft 40 will take place, causing the pin 33 to be disengaged from the clutch 35 and the pin 32 brought into co-operation with its clutch element 34, causing the rotation of the shaft 26 to be transmitted to the worm and worm wheel connected to this clutch element. Thus the ribbon is caused to automatically travel in opposite directions during certain periods of the operation of the typewriting machine.

From the foregoing description it is evident that a simple construction is provided for causing the ribbon to travel a certain distance upon each operation of the typewriter and that the ribbon is automatically caused to travel in the reverse direction when the diameter of one or the other of the ribbon rolls is increased to a certain predetermined dimension.

Having thus fully described my invention, what I claim and desire to cover by Letters Patent is:

1. In a device of the class described the combination of a pair of spools upon and from which a ribbon is wound, a rotatable and endwise movable shaft arranged transversely to the axes of said spools, means mounted upon the shaft for rotation relatively to the shaft operable to cause the rotation of said spools, means provided upon the shaft for alternately engaging the means mounted upon the shaft for rotating said spools, each of said spools being provided with means for engaging the ribbon and moving the shaft endwise to cause said spools to be alternately driven to wind the ribbon thereon.

2. In a device of the class described the combination of a pair of spools upon and from which a ribbon is wound, a rotatable and endwise movable shaft arranged transversely to the axes of said spools, means mounted upon said shaft adjacent each spool rotatable relatively to said spools for driving and releasing said spools, said shaft being rotatable with and respectively to said means, each of said spools being provided with means for engaging the ribbon and moving said shaft into and out of driving engagement with said first mentioned means to alternately drive said spools.

3. In a device of the class described the combination of a pair of spools upon and from which a ribbon is wound, a rotatable and end-

wise movable shaft arranged transversely to the axes of said spools, means movable relatively to said spools mounted upon said shaft adjacent each spool for driving said spools, said shaft being provided with means for releasably engaging said first mentioned means of each spool, said shaft being rotatable with and respectively to said first mentioned means, each of said spools being provided with means for engaging the ribbon and moving said means provided upon the shaft into and out of driving engagement with said first mentioned means to alternately drive said spools.

4. In a device of the class described the combination of a pair of spools upon and from which a ribbon is wound, a rotatable and endwise movable shaft, means mounted upon the shaft adjacent each spool for rotation relatively to the shaft and said spools operable to cause the rotation of said spools, means provided upon the shaft for alternately engaging the means mounted upon the shaft for rotating said spools, each of said spools being provided with means for engaging the ribbon and moving the shaft endwise to cause said spools to be alternately driven to wind the ribbon thereon, said last mentioned means including an element movable to a predetermined position by the winding on said spools and means for causing the automatic actuation of said means after said predetermined position has been reached.

5. In a device of the class described the combination of a pair of spools upon and from which a ribbon is wound, a transversely arranged rotatable and endwise movable shaft extending from one spool to the other, means mounted upon the shaft and arranged at each spool in constant engagement with each spool, said shaft being movable endwise with respect to said means of each spool into and out of driving relation to each of said means to cause said spools to be driven alternately, and means controlled by the ribbon wound upon said spools for moving said shaft endwise into and out of driving relation with said means, said ribbon controlled means being movable to a predetermined position prior to the release of said shaft and first mentioned means and being automatically operable to cause the release of said means and shaft after said pre-determined position is reached.

MAX GARBELL.