Dec. 1, 1931. W. F. HELMOND 1,834,522

TYPEWRITING MACHINE

Filed July 2, 1929

Fig. 1.

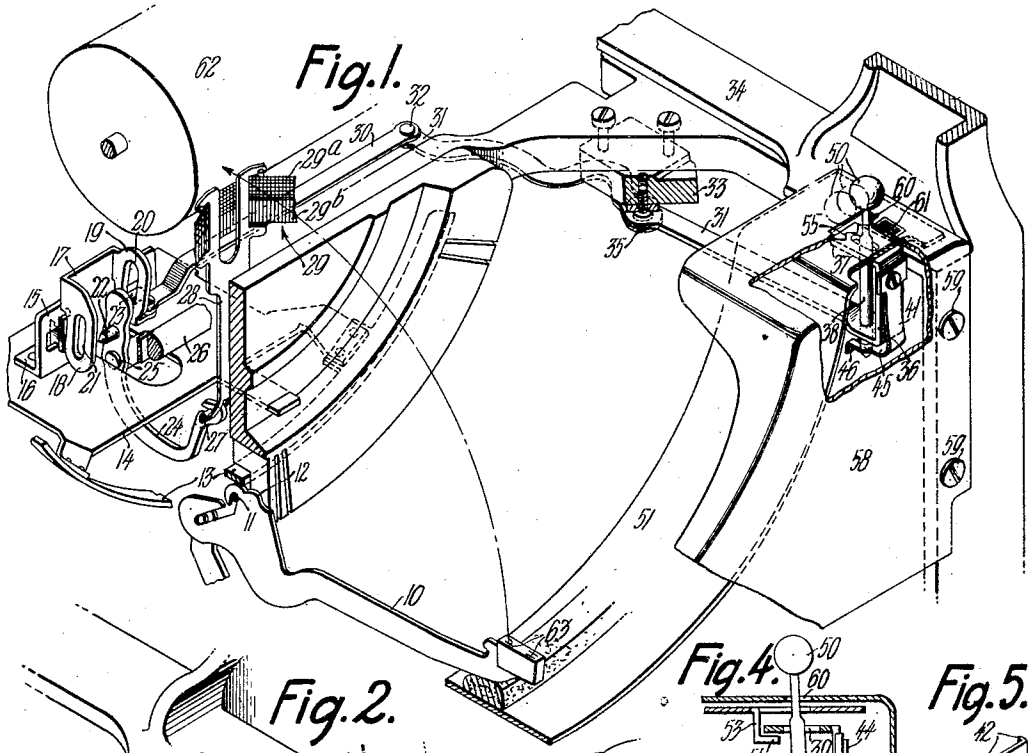


Fig. 2.

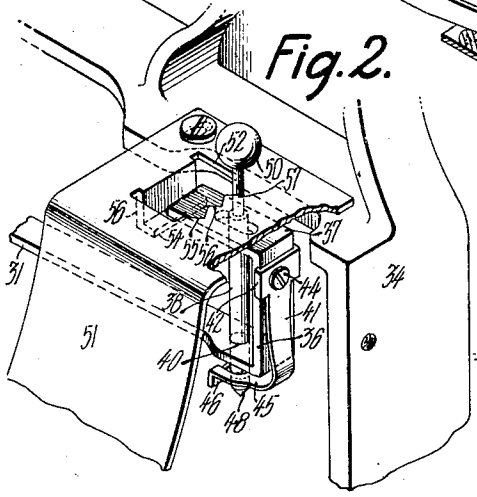


Fig. 3.

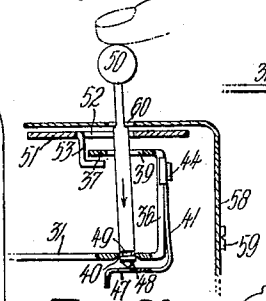


Fig. 4.

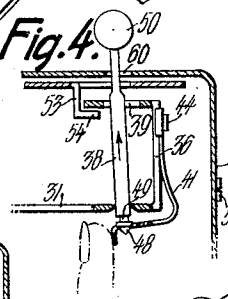


Fig. 5.

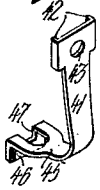


Fig. 6.

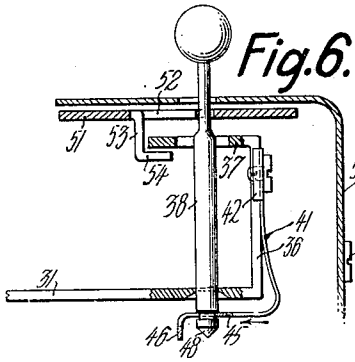


Fig. 7.

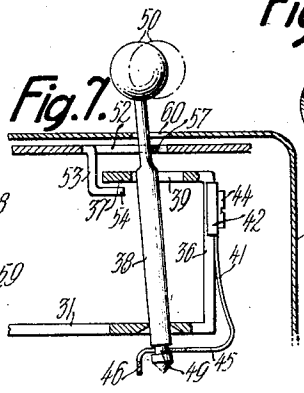
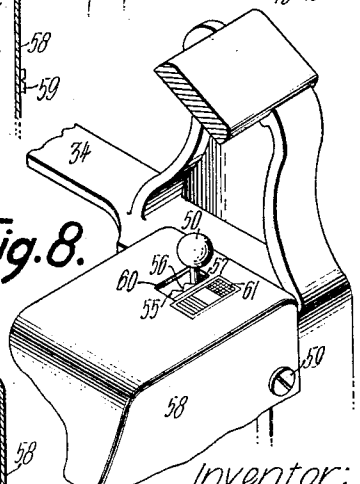


Fig. 8.



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UNITED STATES PATENT OFFICE

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TYPEWRITING MACHINE

Application filed July 2, 1929. Serial No. 375,457.

This invention relates to typewriting machines, and more particularly to ribbon-shifting mechanism. Heretofore the ribbon-shift keys were at the front of the machine on the right-hand side, and overhung some of the type-keys on the top row of the keyboard, so that when an operator had to strike these type-keys, the fingers were liable to touch the ribbon-shift keys.

A feature of the present invention is to eliminate this trouble, and to that end the ribbon-shifting key or handle is so placed on the machine as not to interfere with the movement of the operator's fingers while operating the type-keys.

In the standard typewriting machine, there is usually provided means for obtaining either one of two ribbon-operating positions, and a neutral or inoperative position where the ribbon remains out of action, so that the typewriter can be used for stencil work. The two operative positions are for the purpose of using either of the two color fields on the ribbon, which are usually black and red. The neutral position is not very often used, and therefore in the standard Underwood machine a separate key was provided which, when operated, would render the ribbon-vibrating mechanism inoperative. However, trouble was encountered with this key because many operators never used it and therefore did not know its purpose. When cleaning the typewriter with a brush this key would sometimes be hit and make the ribbon-vibrating mechanism inoperative so that when the operator started to use the machine and no ink impression was made, the machine was thought to be out of order.

In the present invention, therefore, this defect is eliminated by having only one key or operating knob, which, when moved from one position to another, will either be in the black, red, or stenciling position, there being a small chart placed in front of the positions so as to indicate to the operator which one to use.

In machine of this kind it is often necessary to remove the front plate for access to the mechanism below the typebars. Heretofore when this was necessary the ribbon-shift keys had to be removed, which removal altered the adjustment of the ribbon-shifting mechanism, and thereby consumed the time of a skilled mechanic to replace said keys in their properly-adjusted position. In the present invention this does not occur. The mechanism is so constructed that by depressing a retaining spring, the ribbon-shift lever can be taken out and the front plate taken off by taking out the usual holding screws. The ribbon-shift lever may readily be replaced by simply inserting it through holes provided therefor, which necessitates proper alignment of the parts, and pressing it down so as to snap the retaining spring back into place, thereby avoiding the necessity of any adjustments.

Still another feature of the invention resides in the simplicity of the construction of the ribbon-shifting mechanism which reduces the number of parts, making the construction more rigid and less likely to get out of order from use, without providing any adjustments, and also less expensive to manufacture. All the parts in the body of the machine are flat and therefore occupy the minimum amount of space. In the present invention the shift-key or lever is so constructed as to be extremely easy to operate, which result is obtained by loosely pivoting it in the shifting lever and holding it in place by means of a retaining spring having its bearing about one-tenth of the distance away from the pivotal point as the operating end. The key is so arranged that when an operator goes to shift it to the right or left, the lever will unconsciously be pushed slightly back, thereby easing the pressure caused by the retaining spring against the side of the notches, and effect a very easy side movement, which all tends to produce the extremely light shifting movement of the mechanism. It also permits the use of a stronger tension spring which will more securely hold the parts in position.

Another object of the invention is to provide a shifting mechanism which can readily be attached to any existing typewriter having bichrome attachments, with very slight

changes in the machine over the type that has been used heretofore.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a perspective view, partly in section, of a front-strike typewriting machine with a bichrome shifting mechanism of my invention shown applied.

Figure 2 is a perspective of the holding lever and co-related parts for positioning and holding the oscillating mechanism in place.

Figure 3 is an elevation, partly in section, through the frame, cover plate and operating lever, showing the holding lever being inserted, just as the end is passing through the bearing opening and just before it displaces the holding spring.

Figure 4 is a similar elevation, partly in section, showing the holding lever in normal position just before the spring is snapped into place.

Figure 5 is a perspective of the spring for holding the lever.

Figure 6 is a view of the parts shown in Figures 3 and 4 fully assembled.

Figure 7 is a view of the holding lever located on the top of a detent-notch during the shifting movement.

Figure 8 is a perspective of the locking device when applied to a typewriter.

My invention is intended to be used in typewriting machines with bichrome attachments, and is shown as attached to a front-strike machine in which a type-bar 10 is hinged on a fulcrumed rod 11. The cam-surface 12 of the type-bar 10 strikes a universal bar 13 to which is attached a frame 14. Vertically disposed on said frame 14 is a plate 15 with an angular flange 16 at right angles thereto Slidably attached to said plate 15 is a plate or selector 17 having ears 18, 19 bent at right angles thereto. These ears 18, 19 are slotted at 20, 21 to be engaged by pins 22, 23, respectively, when the sliding member or selector 17 is shifted either to the left or to the right.

The pins 22, 23 are rigidly fastened to an oscillating lever 24 which is pivoted at 25 to the carriage-shift frame 26. The forward end of the oscillating lever 24 is pivoted at 27 to a ribbon-oscillator 28, through the upper end of which is threaded a bichrome ribbon 29 in the usual way. The ribbon has two different color fields 29^a and 29^b, either of which can be used at will by using what is known as a bichrome shift.

The ears 18, 19 are so spaced that when the sliding member or selector 17 is in central position neither of the pins engages a slot, and consequently no movement of the oscillator 28 is produced, which therefore is the inoperative or neutral position.

A link 30 is pivotally attached to the selector 17 and also pivoted to a lever 31 by a pin 32. The lever 31 is pivoted to a bracket 33 supporting the ribbon-reversing mechanism on the main frame 34 of the machine. This pivot is a shouldered screw 35 fastened in the bracket 33.

The forward end of the lever 31 is bent upward at substantially a right angle to form the leg 36, and back at about the same angle to form the leg 37, making the forward end of the lever 31 substantially U-shaped.

In the U-shaped end of the lever 31 a thumb-piece having a stem or lever 38 is loosely mounted by cutting a slot 39 in the leg 37 of just sufficient width to freely receive the body of the thumb-piece 38. Directly beneath this slot and centered in the forward end of the lever 31 is a circular hole 40 of just sufficient size to freely receive and closely confine the body of the thumb-piece 38. This serves as a bearing for stem 38, which vibrates forwardly and backwardly in slot 39, the latter extending longitudinally of the lever, and enabling the thumb-piece to swing the lever 31 to right or left. Fastened to the under side 36 of the U is a leaf-spring 41. The upper end of this spring 41 is formed with two flanges 42 spaced so as to grip the edges of the leg 36 of the U-shaped lever 31. A hole 43 in said spring, to receive a screw 44, is the means of fastening the spring to the leg 36. The lower part 45 of the spring 41 is formed by bending substantially at a right angle to the body, and at its extreme end is formed a downwardly-extending lip 46 in this forward end 45, and a slot or fork 47, of just sufficient width to freely receive the coneshaped end 48 of the stem 38, is punched in the forward end 45.

This stem 38 is a rod with a uniform diameter the greater part of its length, but at the lower end 48 it is cone shaped to facilitate its entry into the slot 39 and the hole 40 in the U-shaped end of the lever 31, as well as into the fork or slot 47 of the spring 41.

Directly above the cone-shaped end 48 is a circumferential groove or neck 49 intended to receive the part of the spring 41 at the rear of the groove 47. The thumb-piece 38 has a tip or ball 50 at its exposed end to facilitate the operation of the thumb-piece 38, thereby shifting the ribbon-mechanism.

By punching a fixed frame-plate 51 forming part of the usual type-rest on three sides, an opening 52 is made. The punching is bent downwardly to form a leg 53 and forwardly to form a shelf or flange 54 to guide and support the forward end 37 of the lever 31.

The forward end of this opening 52 is formed with three notches, 55, 56 and 57, for the purpose of holding the thumb-piece or lever in three distinct positions. Over all this mechanism extends a face plate 58 secured to the frame of the machine by screws 59.

The slot 39 is of just sufficient length to

allow the thumb-piece 38 to clear the retaining shoulders or teeth 55, 56 and 57, thereby acting as a stop for the thumb-piece 38 and preventing over-tensioning and consequent weakening of the spring 41.

In the top part of the face plate 58 is punched an opening 60 in the form of a slot, and is situated so that it registers with the slot 52 of the type-rest plate 51 exposing the notches 55, 56, 57. A chart 61, indicating what each notch 55, 56, 57 means, is fixed on the top of the face plate 58 and adjacent the notches.

In Figure 1 the ordinary platen is conventionally shown at 62.

By reference to Figure 1 it will be seen that when the thumb-piece 38 is adjusted in the notch 57, as shown, the slidable selector 17 engages the pin 23 in its slot 20, and when the type-bar 10 is moved upwardly to make an impression it acts on the universal bar 13 which moves the frame 14, and through the slot 20 in the selector 17 and the pin 23 on the oscillating lever 24, the ribbon-oscillator 28 is thrown upward for a short stroke, thus bringing the upper field 29^a between the type 63 and the platen 62.

When the thumb-piece 38 is shifted to the central notch 56, it moves the lever 31 to the right, and through the connecting link 30 pulls the sliding member 17 to the right, disengaging the slot 20 from the pin 23. In this position the oscillating lever 24 is entirely disengaged from the universal frame 14 and consequently is in its normal or inoperative position, so that the ribbon-carrier 28 remains at rest when a type-bar 10 is thrown upward toward the platen 62. This is called the neutral or stenciling position.

When the thumb-piece 38 is shifted to the notch 55, the pin 22 on the oscillating lever 24 is engaged by the slot 21 in the sliding member 17, link 30 and shifting lever 31. This connects the universal frame 14 and the oscillating lever 24 in a similar manner as in the first case, above recited, but with a shorter leverage on the oscillating member 24, which accordingly produces a greater throw for the ribbon-oscillator 28, bringing the lower field 29^b of the ribbon 29 between the type 63 and the platen 62 of the machine, and making an impression of that color.

When it is desired to remove the face plate 58, the end 45 of the spring 41 is pressed back with the finger, as shown in Figure 4, toward the front of the machine, which releases the spring 41 from the groove 49 of the thumb-piece 38, and it is free to be pulled out by gripping the ball 50. This frees the face plate 58 and it can be removed from the machine by taking out the screws 59 at each side of the machine without disturbing any of the shifting mechanism.

When the repair work is done, the face plate 58 is fastened with screws 59 and the thumb-piece 38 inserted through the opening 60 in the face plate, then through the hole 52 in the type-rest plate, and finally through the openings 39 and 40 in the U-shaped end of the lever 31. By a little downward pressure on the ball 50, the cone-shaped end of the thumb-piece 38 will deflect the spring 41 and as the thumb-piece is further depressed the spring will snap into the groove 49 of the thumb-piece 38, thus coupling the parts together ready for operation without requiring any adjustment of the parts to get them to co-operate properly.

From this construction it is evident that all parts are held in adjustment by the thumb-piece 38, because the openings 60 in the face plate, 52 in the type-rest plate, and 39 and 40 in the lever 31 must all register and are held that way by the thumb-piece 38. It will readily be seen that this construction places the ribbon-adjusting device on the top of the machine out of the way of accidental hitting by the operator. The construction is simplified by the reduction of parts required, which makes its operation more accurate and reduces the cost of manufacture. Its construction also permits quick and ready disassembling of parts, and when reassembled it automatically adjusts itself by compelling co-ordination of the parts so that no skill is required.

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. A bichrome-ribbon mechanism for typewriting machines, having a color-adjusting train including a movable controlling arm, a thumb-piece for said arm, said thumb-piece having a stem, said arm having a perforation forming a bearing closely confining one end of said stem, said arm also having a slot spaced from said perforation, to form a co-operative bearing for said stem and permit vibration of the stem in the slot, a spring tensioned to retain said stem in one end of said slot, and a stationary rack having notches into which said stem is snapped and held by said spring; the arm being movable by said thumb-piece, and the stem being capable of shifting with said arm from one notch to another, to re-set said arm selectively.

2. In a bichrome attachment for a typewriter having a face-plate, a selector, a lever connected thereto, said lever having a U-shaped end, a circular hole being formed in one leg of the U to act as a fulcrum, a fixed frame-plate, a slotted opening being provided in the other leg of the U and registering with openings formed in the frame-plate and face-plate, a thumb-piece having a rod fitting in said openings for positioning said lever, and

a spring fastened to the bottom of the U, and pressing against the lower end of said thumb-piece, grooves or notches being formed on the edge of the frame-plate to hold the lever in any position desired.

3. In a bichrome attachment for a typewriter having a face-plate, a selector, a lever connected thereto, said lever having a U-shaped end, a circular hole being formed in one leg of the U to act as a fulcrum, a fixed frame-plate, a slotted opening being provided in the other leg of the U and registering with openings in the frame-plate and face-plate, a thumb-piece having a stem fitting in said openings for positioning said lever, and a spring fastened to the bottom of the U, a neck being formed in the lower end of the stem to receive the end of said spring, and notches being formed in the opening of the fixed plate to receive and hold the stem in position.

4. In a bichrome attachment for typewriters, a lever having a U-shaped end, the legs of said U having openings registering with each other, the one being circular and the other in the form of a slot, a spring substantially L-shaped and fastened to the bottom of the U, and a thumb-piece including a rod with a cone-shaped end and adjacent groove held in said openings by the spring, a registering opening being provided in the frame of the machine, and notches being provided to hold said thumb-piece and lever in adjusted position.

5. A bichrome-ribbon mechanism for typewriting machines, having a color-adjusting train including a movable controlling arm, a thumb-piece for said arm, said thumb-piece having a stem, said arm having a perforation forming a bearing closely confining one end of said stem, said arm also having a slot spaced from said perforation, to form a co-operative bearing for said stem and permit vibration of the stem in the slot, a spring tensioned to retain said stem in one end of said slot, and a stationary rack having notches into which said stem is snapped and held by said spring; the arm being movable by said thumb-piece, and the stem being capable of shifting with said arm from one notch to another, to re-set said arm selectively, said slot being formed in an ear provided upon said lever, said spring being mounted upon said arm and having a fork, and said stem having a neck detachably fitting in said fork; said bearing being between said neck and said slot.

6. In a typewriting machine with bichrome-ribbon attachment, the combination of a shifting member, a link and a lever attached to said member, a pivot on the frame of the machine for said lever, said lever having a U-shaped end, a thumb-piece having a stem mounted for vibration in said U-shaped end, and capable of adjusting said lever, a slot being provided in the frame of the machine to receive said stem, notches being formed in one edge of the slot, and a spring pressing against said stem to hold it in any one of the notches and thereby retain the lever in the position selected.

7. In a typewriting machine with bichrome-ribbon attachment, the combination of a shifting member, a link and a lever attached to said member, a pivot on the frame of the machine for said lever, a positioning device for said lever consisting of a U-shaped end, a thumb-piece loosely held in said U-shaped end, a slot being provided in the frame of the machine to receive said thumb-piece, notches being formed in one edge of the slot, a pivot on the lever about which the thumb-piece moves, and a spring operating against said thumb-piece to hold it in engagement with any of the notches.

8. A bichrome-ribbon mechanism for typewriting machines, having a color-adjusting train including a movable controlling arm, a thumb-piece for said arm, said thumb-piece having a stem, said arm having a perforation forming a bearing closely confining one end of said stem, said arm also having a slot spaced from said perforation, to form a co-operative bearing for said stem and permit vibration of the stem in the slot, a spring tensioned to retain said stem in one end of said slot, and a stationary rack having notches into which said stem is snapped and held by said spring; the arm being movable by said thumb-piece, and the stem being capable of shifting with said arm from one notch to another, to re-set said arm selectively, said spring being movable away from working position to permit the stem to be withdrawn from the machine.

9. In a positioning device for bichrome attachments for typewriting machines, the combination of a shift member, a link, a lever pivoted to the link, the forward end of the lever being substantially U-shaped, a thumb-piece having a stem for operating and holding said lever, a round opening being formed in one leg of the U to confine and act as a fulcrum for the stem, a slot being formed longitudinally of the lever, in the opposite leg of the U, for guiding said stem in a vibratory movement, a rack upon the frame of the machine, and a spring co-operating with said stem to urge it into said rack.

10. In a positioning device for bichrome attachments for typewriting machines, the comination of a shift member, a lever to operate the same, the forward end of the lever being substantially U-shaped, a thumb-piece for operating and holding said lever, an opening being provided in one leg of the U to act as a fulcrum for the thumb-piece, a slot being formed in the opposite leg of the U for receiving said thumb-piece, the frame of the machine having a second slot registering with the first slot, notches being provid-

ed in one side of said slot in the frame, and a spring co-operating with said thumb-piece to urge it toward the side of said slot having said notches to hold it in any position.

11. In a bichrome mechanism for typewriting machines, the combination of a shiftable lever, the end of the lever being substantially U-shaped, a thumb-piece having a stem for operating and holding said lever, a round opening being formed in one leg of the U to confine and act as a fulcrum for the stem, a slot being formed in the opposite leg of the U for guiding said stem, and to enable the thumb-piece to adjust the lever, a stationary rack having notches, and a spring fastened to the bottom of the U and engaging the stem to urge it into the notches.

12. A bichrome-ribbon mechanism for typewriting machines, having a color-adjusting train including a movable controlling arm, a thumb-piece for said arm, said thumb-piece having a stem, said arm having a perforation forming a bearing closely confining one end of said stem, said arm also having a slot spaced from said perforation, to form a co-operative bearing for said stem and permit vibration of the stem in the slot, a spring tensioned to retain said stem in one end of said slot, and a stationary rack having notches into which said stem is snapped and held by said spring; the arm being movable by said thumb-piece, and the stem being capable of shifting with said arm from one notch to another, to re-set said arm selectively, said slot being formed in an ear provided upon said lever, said spring being mounted upon said arm and having a fork, and said stem having a neck detachably fitting in said fork; said bearing being between said neck and said slot, and a fixed cover-plate having an opening for said stem adjacent said rack, said spring being movable away from working position to permit the stem to be withdrawn from the machine, and also to permit the withdrawal of said cover-plate.

WILLIAM F. HELMOND.