June 30, 1931. L. A. NEMCOVSKY 1,812,447

TYPEWRITING MACHINE

Original Filed July 15, 1924

Fig. 1.

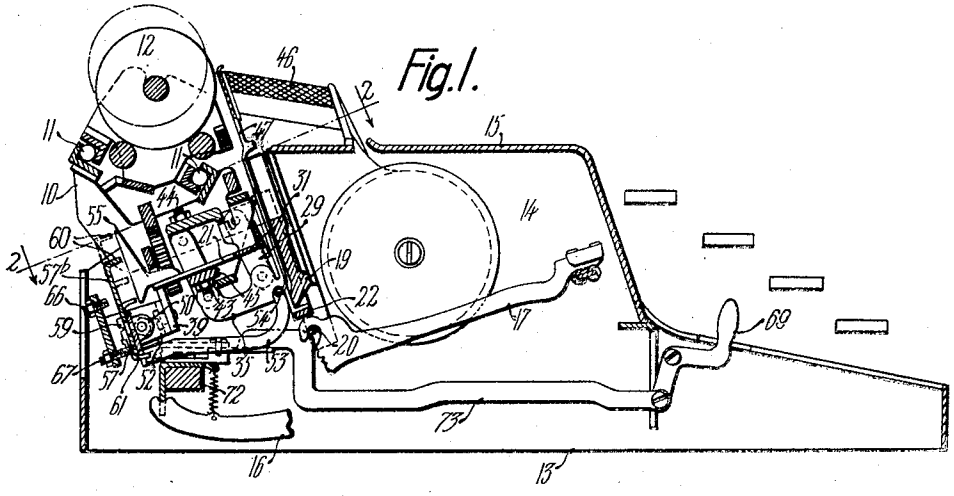


Fig. 2.

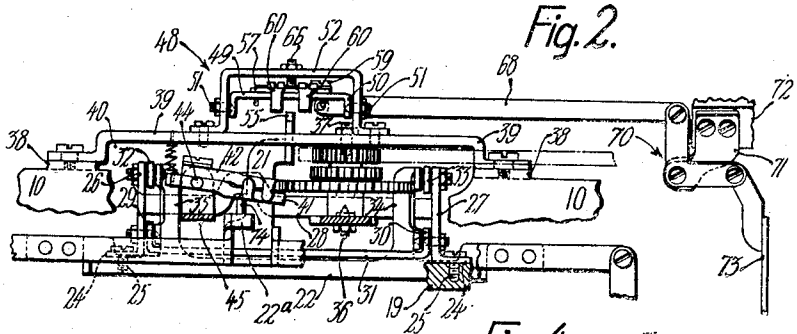


Fig. 3.

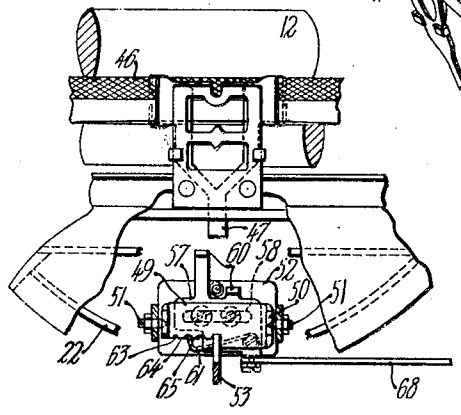
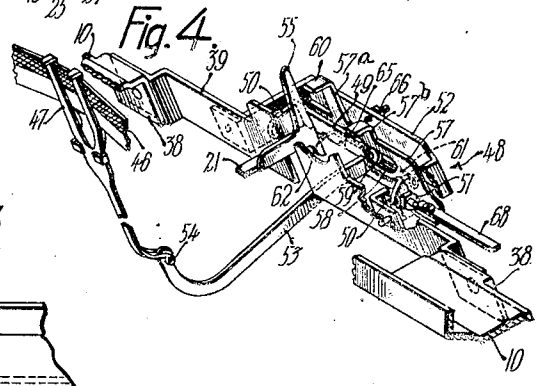


Fig. 4.



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1,812,447

UNITED STATES PATENT OFFICE

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TYPEWRITING MACHINE

Original application filed July 15, 1924, Serial No. 726,063. Divided and this application filed September 29, 1927. Serial No. 222,700.

My present invention relates to typewriting machines and in its more specific application to machines of the type designated as portable. Portable typewriting machines equipped with keyboards departing from standard, are difficult to operate by typists ordinarily trained to operate on standard keyboards, while portable typewriters designed to be collapsed for enclosing into the box and set up for use may be lacking in the durability of non-collapsible typewriters and are more likely to become out of order.

It is an object of my invention to provide a portable typewriter having a standard keyboard of usual dimensions, which typewriter shall be light in weight, non-collapsible and correspondingly durable in construction and of small exterior dimensions, so that it can be enclosed in normal operative condition within a small case.

According to a feature of the invention, the parts of the typewriting machine are assembled in a particularly compact relation to confine the outside dimensions of the machine within minimum proportions. In the preferred embodiment, the universal bar is actuated by the type-bars and is assembled to the segment-plate and has an open structure to afford space for accommodating the escapement pinion and associated devices which are mounted on the movable carriage base-plate. The platen is raised in an oblique direction for the case-shift and the segment-plate is disposed at the same inclination, thereby limiting the height of the machine and affording space below the carriage for the ribbon-shift mechanism, which is preferably mounted on the carriage-shift frame and is shiftable therewith when the same is operated for case-shift movement. The ribbon-shift mechanism is actuated from the rear of the universal bar, the shift-mechanism including a link extending forward between the universal bar and the key-levers therebelow.

Another object is to provide a ribbon-shift mechanism of simple construction which is adapted to be readily set for bringing into the path of the type any portion of the width of the ribbon, one special application being to the selective use of either color on a two-color ribbon, the construction having preferably a third or inoperative setting for stencil writing or cutting where the ribbon is maintained out of the path of operation of the type-bars. In the preferred embodiment, the ribbon-shift mechanism includes a pivoted lever, one of the arms of which has fingers of different lengths, adjustment means being provided to bring any of said fingers into the path of operation of the universal bar.

This application is a division of my application, Serial No. 726,063, filed July 15, 1924, (now Patent No. 1,684,801, dated September 18, 1928).

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a view in longitudinal cross-section through a preferred form of typewriting machine.

Figure 2 is a sectional view taken along the line 2—2 of Figure 1.

Figure 3 is a fragmentary front elevation of the machine.

Figure 4 is a fragmentary perspective view of the ribbon-vibrating mechanism.

Referring now to the drawings, the typewriter-carriage-shift frame includes the usual base-plate 10 having ball-bearing 11 on which is mounted a carriage having a platen 12. A base-frame 13 is provided with a unitary stamped enclosure formed with enclosing side walls 14 and a top 15, and said enclosure may be secured to said frame in the familiar manner as by screws (not shown).

Within the machine-frame are supported the key-levers 16, type-bars 17, and other elements to be described below.

As shown in the drawings, the segment-plate 19 is disposed relatively low, the central or lowest point of the type-bar supporting bail 20 thereon being substantially at the level of the upper edges of the bank of key-levers 16. The connecting linkage from the key-levers to the type-bars occupies little space otherwise useful, said linkage being disposed largely in the space between the key-levers and below the upper edges there-

of. The height of the machine is preferably further reduced by inclining the segment-plate 19 rearward, in the embodiment shown in the drawings, about 20 degrees, leaving ample space back of the lower or forward part of the segment-plate for the escapement and related mechanism, which latter is preferably mounted on the carriage-shift frame and extends within the boundaries of the universal bar, between the segment-plate and the rear of the machine.

The universal bar 21 comprises an arcuate member 22 extending immediately below and assembled to the inclined segment-plate 19, which is mounted at an inclination to the vertical, parallel to the case-shift rods (not shown). In the present embodiment, as shown in the drawings, the segment-plate 19 is curved in the plane thereof and is inclined at an angle of substantially 20 degrees from the vertical. The universal bar is supported in a special manner to reduce the frictional losses to a minimum and to eliminate inaccuracies resulting from wear. For low friction mount, I provide a support-bracket 24 preferably secured as by screws 25 to the segment-plate 19 and having a pair of parallel arms 26 and 27 extending rearward and connected by a bar 28. In the preferred embodiment, the suspension comprises a rocker formed of a pair of parallel links 29 and 30, depending respectively from bracket-arms 26 and 27 and rigidly connected by a cross-bar 31. A pair of separate and distinct links 32 and 33 are pivoted to the rearward or free ends of bracket-arms 26 and 27. The universal bar 21 is formed with integral lugs 34 and 35 extending rearward from the arcuate segment 22 thereof, and supported respectively from bracket-arms 26 and 27 by parallel links 29 and 32 and links 30 and 33. The escapement and associated mechanisms mounted on the carriage-shift frame extend into the free space thus provided back of the segment-plate 19 and between the universal bar supporting links. The universal bar, as will be hereinafter described, has separate elements for initiating a plurality of separate and distinct operations of the machine. It will be seen that in operation of the universal bar, the same moves by a parallel link movement, the links advancing and returning by movement parallel to each other. The displacement of the universal bar is by movement strictly parallel to itself without engendering appreciable friction or wear.

The pivot-pins 36 and 37 for the escapement-mechanism are mounted respectively in an angle-bar 38 secured to the base-plate 10 of the carriage, and a backing bar 39 bolted to said angle-bar, and affording a working space 40 therebetween for accommodating said escapement-mechanism. The fixed and stepping escapement-dogs 41 and 42, respectively, also are disposed between angle-bar 38 and backing bar 39, pivots 43 and 44 supporting the fixed dog 41 by ears 45 formed integrally therewith. At each operation of the universal bar a tongue 22^a thereon operates an interponent 74 which in turn operates the dogs 41 and 42.

The ribbon-shift mechanism is preferably mounted on the carriage-shift frame 10. The ribbon 46 is held in the usual ribbon-carrier 47 adjacent the platen and below the path of the type on the type-bars 17. The shift of the ribbon 46 for raising it to printing position is effected through a ribbon-vibrator 53 pivotally secured to the carriage-shift frame 10 to be vibrated by the carriage-feeding movement of the universal bar 21 and extending, as indicated in the drawings, under the universal bar and over the key-levers 16, to the ribbon-carrier 47 at the rear of the segment 43, so that the mechanism does not add to the over-all dimensions of the machine. The ribbon-vibrating mechanism 48 includes a rocker 49 formed with end ears 50 pivoted as at 51 within a yoke-bracket 52, the latter secured to the rear of the backing bar 39, secured on the carriage-shift frame 10, as heretofore described. Integral with the rocker 49 is the ribbon-vibrator 53 extending forward therefrom and terminating adjacent to the rear face of the segment-plate 19, where a pivot 54 at the forward end of said vibrator 53 supports the ribbon-carrier 47. I have shown an arrangement providing for settings for two alternative degrees of elevation for the ribbon, particularly useful for a two-color-ribbon-shift mechanism, and affording a third setting out of the path of operation of the universal bar, for stencil-cutting. In the preferred embodiment shown, the rocker 49 carries a shiftable plate 57 secured to the rocker 49 by screws 59 passing through a slot 58 and into said rocker. The shift plate 57 carries a pair of integral upstanding tongues 57^a and 57^b (see Figure 4) of different lengths, and having bent-over forwardly projecting ends 60. Either tongue end may be shifted into and out of the path of a nose 55 of the universal bar 21, by a corresponding shift of the plate 57 along the screws 59.

A spring 61 carried on the rocker 49 has an end 62 to snap into any one of three notches 63, 64 and 65 in the adjacent edge of the plate 57, for holding the plate at either of its three positions, the central of said notches corresponding to stencil-cutting in which both tongues 57^a and 57^b are maintained at either side of the path of the nose 55 of the universal bar and the ribbon is not vibrated. Notches 63 and 65 correspond to the two operative or ribbon-vibrating settings, in which tongues 57^a and 57^b respectively are in the path of the universal bar. Stops 66 and 67 are provided upon yoke-bracket 52 for limiting the swing of the rock-

er 49 and of the tongues 57ª and 57ᵇ, and these stops may be adjustable screws, as shown.

In the preferred embodiment, the usual ribbon-field-shift lever 69 is employed to shift the plate 57 in any of its alternative positions, through a link 68 fixed at one end to the plate 57, and at its other end to one arm of a bell-crank 70. The bell-crank is pivotally mounted on a bracket 71 fixed to a cross-bar 72. The other arm of the bell-crank 71 has pivotally attached thereto one end of a forwardly-extending link 73. The link 73 at its other end is pivotally connected to the shift-lever 69 so that by operation of the shift-lever 69, forward or rearward, the plate 57 will be operated to position the tongue 57ª or 57ᵇ with respect to the nose 55 of the universal bar.

It will be seen that the ribbon-vibrating train of connections afford substantial multiplication of ribbon-carrier displacement, by reason of the long ribbon-vibrator 53 compared with the length of the tongue 57ª or 57ᵇ actuated by the universal bar. Therefore, the elevation of the ribbon will be substantially greater than the shift of the universal bar. The ribbon-vibrating mechanism, however, does not add substantially to the bulk of the machine, since the connections are fitted into spaces otherwise unoccupied below the platen, to the rear of the universal bar, and between the latter and over the key-levers.

It will readily be understood that when the longer tongue 57ª is shifted to be in the path of the nose 55 of the universal bar, the ribbon-carrier 47 will be shifted by the uniform operation of the universal bar through a lesser throw than when the shorter tongue 57ᵇ is shifted to be engaged by said nose.

It will be understood that by adjustment of screw-stops 66 and 67, the shift of the ribbon may be readily and accurately adjusted, thereby obviating the likelihood of typing the upper half of a letter in one color and the lower in another, which may otherwise occur in the use of two-color ribbons.

It will be seen that the two tongues 57ª and 57ᵇ of graduated lengths afford a plurality of changes of printing zone on a ribbon, so that any selected portion of the width of a ribbon of any width may be placed in the path of the printing type. By such construction, the entire width of a single color ribbon may be used without need for removing the ribbon from the machine for re-adjustment. As before described, the ribbon-shift mechanism, the universal bar, the escapement and other associated mechanisms are all arranged in a very compact form, the ribbon-shift mechanism being mounted on the bar 39, which in turn is fixed to the carriage-shift frame 10 and therefore moves with the carriage when the latter is shifted for enabling the typing in upper case position. This shifting of the carriage-shift frame 10 shifts the tongues 57ª and 57ᵇ with respect to the universal bar and, therefore, the nose 55 of the latter is so constructed that it will engage the tongues 57ª and 57ᵇ in either of their shifted positions when the universal bar is operated.

From the above description, it will be noted that the plane of the segment is tangent to a typing position slightly above a front-stroke position at the platen for greater visibility for an operator resting the baseboard of the machine upon the lap; that the raising of the printing position between a front-strike and a top-strike position on the platen raises the type-bar basket or rest and correspondingly lowers the platen, so that the highest point of the types at rest is approximately on a level with the top of the platen which limits the height of the machine; that the forward inclination of the segment and universal bar establishes a hypothenuse for a mechanism-enclosing right-angle triangle that is further bounded by the horizontal key-levers for a base-line, and by a perpendicular line substantially tangent to the rear face of the platen which limits the depth of the machine, and within the triangle so bounded all the ribbon-vibrating mechanisms is compactly assembled; and that the connections intermediate the type-bar-driven universal bar and the ribbon are a train of parts having a pair of terminals 57ª and 57ᵇ, providing an interrupted connection with the universal bar and shiftable into and out of abutting engagement with said bar to variably actuate the same train to present different color-fields of the same ribbon to cover the same typing position at either case-shift position of the platen.

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 ribbon-vibrating mechanism including a stationary type-bar segment and a type-bar driven universal bar on said segment, a shift-frame mounting a platen for case-shift movement, a two-color ribbon, a ribbon-vibrator formed with a wide base, spaced-apart pivots on said frame to rockably support said base between them to stabilize the swing of the ribbon-vibrator, a plate slidably mounted upon said base, tongues on said plate that vary in length to vary the rocking extent of said base by the universal bar and settable to present either color of the ribbon to the platen, and a manually-operable train having connections with said plate to set either tongue.

2. In a ribbon-vibrating mechanism including a type-bar-driven universal bar, in combination, a shift-frame mounting a car-

riage for case-shift movement, a ribbon-vibrator having a rocker pivoted to said frame, a shiftable plate mounted upon said rocker, having a screw-and-slot arrangement for guiding said plate in alternative positions, said plate having a plurality of tongues thereon of different lengths to be disposed selectively in the fixed path of the universal bar, and means for holding said plate in any shifted position.

3. A ribbon-vibrating mechanism including a type-bar-driven universal bar receiving a uniform movement from each type-bar, a shift-frame mounting a carriage for case-shift movement, a ribbon-vibrator formed with a wide flat base, widely-spaced-apart pivots on said frame to rockably support said base between them to stabilize the swing of said ribbon-vibrator, tongues of different lengths slidably mounted upon said wide flat base and independently actuated by a one-way movement of said universal bar to vary the swing of said base and its ribbon-vibrator, a train having means to set said tongues relatively to the universal bar, and stop means on said frame to independently engage said rocking flat base at opposite sides of its rocking center to limit the swing of said rocker in two directions at either case-shift position of the carriage and at either setting of said tongues.

4. A ribbon-vibrating mechanism including a universal bar, a frame mounting a carriage and a carriage-feeding mechanism controlled by the universal bar, a ribbon-vibrator formed with a wide flat base, widely-spaced-apart pivots on said frame to engage and rockably support said base between them to stabilize the swing of said vibrator, a tongue mounted upon said base, having a one-way engagement with said universal bar to be driven thereby and not interfere with the independent return of said universal bar to operate the carriage-feeding mechanism, and stop means on said frame to independently engage said flat base at opposite sides of its rocking center to limit the swing of said rocker in two directions.

5. A portable typewriting machine including a stationary segment inclined rearwardly from the vertical to direct a series of type-bars to swing upwardly, rearwardly and downwardly to establish a more accessible printing center upon a platen, a rearwardly-inclined frame mounting a platen-carriage for a case-shift movement, long spaced-apart brackets projecting from the rear of the segment, a pair of links pivoted to each bracket, a universal bar curved around said segment and having two rearwardly-extending lugs, each lug pivotally connected with a pair of links that suspend and direct the universal bar in a straight line downwardly and rearwardly, a motion-conveying arm projecting rearwardly from the universal bar and having a long nose, a mechanism-enclosing bracket secured to the rear of the shift-frame, and ribbon-vibrating mechanism supported by said bracket, including a ribbon-vibrator rockable upon pivots in said bracket, a plate on said vibrator and having tongues engageable by the nose of the universal-bar arm, and means connected with said plate, effective to bring any tongue into alignment with said motion-conveying nose of the universal bar.

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