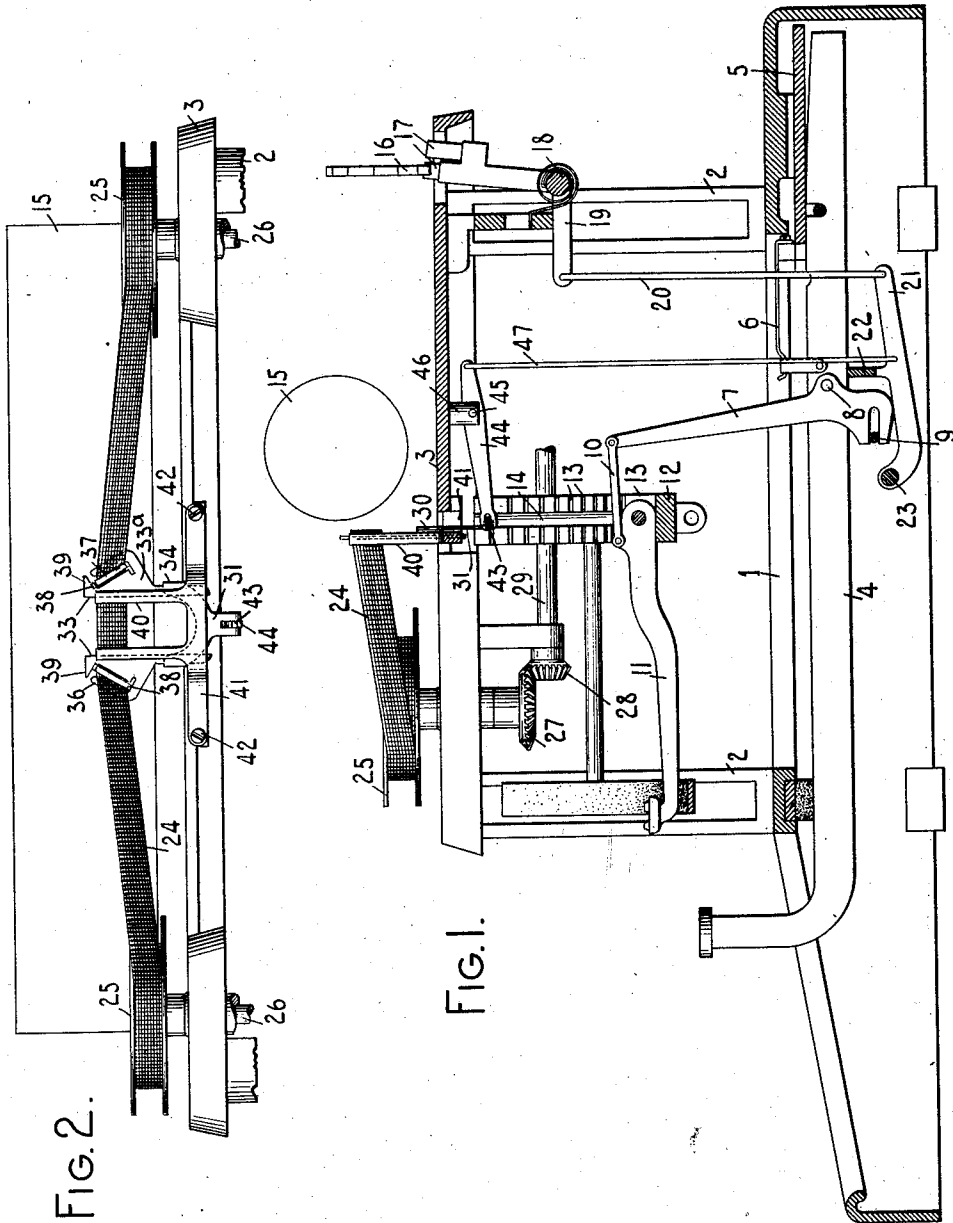


J. FELBEL.  
TYPE WRITING MACHINE.  
APPLICATION FILED DEC. 10, 1910.

1,010,418.

Patented Dec. 5, 1911.

2 SHEETS-SHEET 1.



WITNESSES:

*E. M. Wells.*

*M. W. Pool.*

INVENTOR:

*Jacob Felbel*

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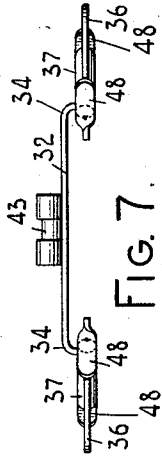


FIG. 7.

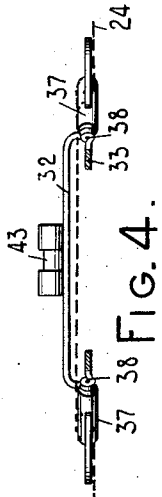


FIG. 4.

WITNESSES:

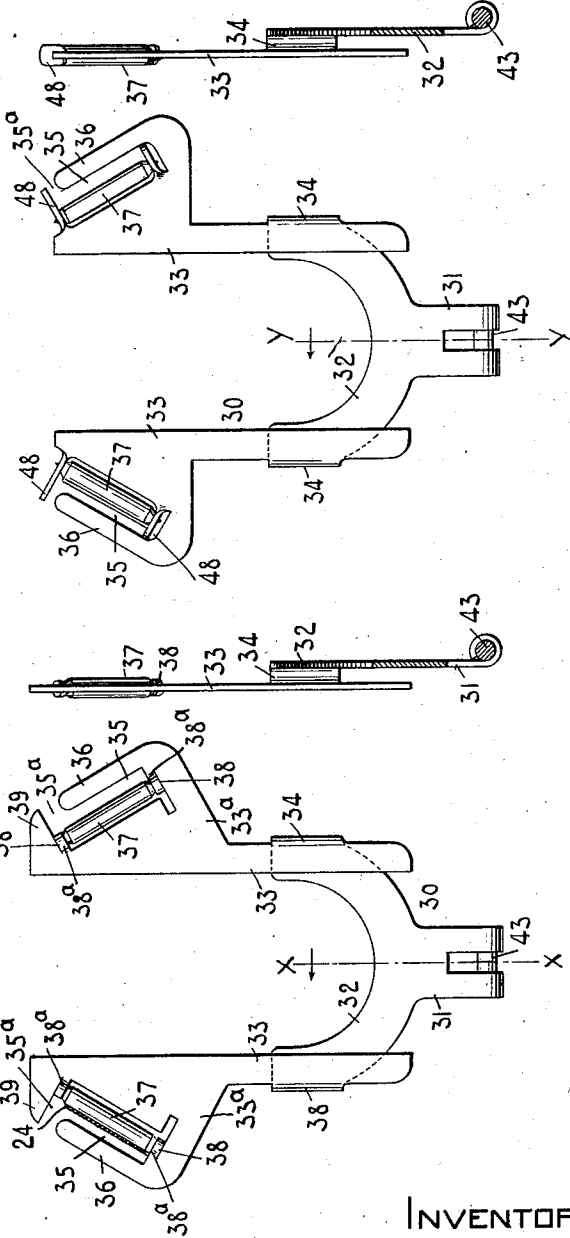
*P. M. Wells*  
*m. w. Pool*

FIG. 8.

FIG. 6.

FIG. 5.

FIG. 3.



INVENTOR:

*Jacob Felbel*

# UNITED STATES PATENT OFFICE.

JACOB FELBEL, OF NEW YORK, N. Y., ASSIGNOR TO UNION TYPEWRITER COMPANY, OF  
ILLION, NEW YORK, A CORPORATION OF NEW YORK.

## TYPE-WRITING MACHINE.

1,010,418.

Specification of Letters Patent.

Patented Dec. 5, 1911.

Application filed December 10, 1910. Serial No. 596,699.

*To all whom it may concern:*

Be it known that I, JACOB FELBEL, citizen of the United States, and resident of the borough of Manhattan, city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to the ribbon mechanism of typewriting machines, and has for its main object to provide an improved ribbon carrier or vibrator through which the ribbon may be fed smoothly, with a minimum of wear and with a less expenditure of power applied to the ribbon feeding mechanism than heretofore.

To the above and other ends the invention consists in the features of construction, and combinations and arrangements of parts herein fully described and particularly pointed out in the claims.

In carrying out my invention in the present instance I provide rotary devices or rollers over which the ribbon runs in passing through the vibrator, these rollers taking the place of rigid corners or edges in the vibrator structure.

In the accompanying drawings, Figure 1 is a front to rear vertical sectional view, taken about centrally, of so much of the typewriting machine as is necessary to illustrate my invention. Fig. 2 is a front elevation of the upper portion of the machine, parts being omitted. Fig. 3 is a front elevation of the ribbon vibrator shown on an enlarged scale. Fig. 4 is a top plan view of the vibrator shown in Fig. 3, but with the guard hooks sectioned away. Fig. 5 is a vertical sectional view taken on a plane represented by the line  $x-x$  in Fig. 3 and looking in the direction of the arrow at said line. Fig. 6 is an enlarged front elevation of a modified construction of ribbon vibrator. Fig. 7 is a top plan view of the vibrator shown in Fig. 6. Fig. 8 is a vertical sectional view taken on a plane represented by the line  $y-y$  in Fig. 6, and looking in the direction of the arrow at said line.

In the drawings the main frame of the machine is shown as comprising a base 1, corner posts 2 and a top plate 3.

4 is one of a series of key levers fulcrumed on a fulcrum plate 5 and each pro-

vided with a restoring spring 6. A sub-lever 7 is pivoted at 8 to the key lever 4, said sub-lever being slotted near its lower end to co-act with a fixed abutment 9. The upper end of each sub-lever is connected by a link 10 with a type bar 11 which is one of a segmentally arranged series mounted on a segmental type bar support 12 in any known manner. As herein shown, each type bar is guided in a radial slot 13 in said support and is pivoted on a fulcrum wire 14 which is seated in a groove in the top of the segmental support 12. The segmental support 12 is preferably connected with and operative by a shifting mechanism of known construction, but for the purposes of my invention the segment 12 may, if desired, be non-shiftable. The type bars 11 are adapted to coöperate with the front face of a platen 15 which is diagrammatically illustrated, said platen being mounted in a carriage (not shown) which is operatively connected with a carriage feeding element or wheel 16. Escapement dogs 17 are adapted to coöperate with the wheel 16, said dogs being mounted on a dog rocker 18, an arm 19 whereof is connected by a link 20 with an arm 21 of a universal bar frame carrying a universal bar 22 which extends from side to side of the machine beneath the series of key levers, said frame being pivoted at 23 in the sides of the base.

An ink ribbon 24 has its ends secured to a pair of horizontally arranged ribbon spools 25, one at each side of the machine above the top plate and forward of the platen. Each ribbon spool is secured to the top of a vertical shaft 26, the lower end of which is provided with a small beveled gear wheel 27 which engages with a beveled pinion 28 at the forward end of a horizontally arranged shaft 29, the rear end whereof is adapted to be connected with a ribbon feeding mechanism of suitable construction, and which, as it is not necessary to a proper understanding of the invention, has not been illustrated herein.

That part of the ribbon 24 which extends across the machine from one spool to the other in front of the platen is normally maintained below or away from the printing point, and the central or printing portion of the ribbon is, during printing operation, moved to cover the printing point and

is thereafter moved to again uncover the printing point. The vibratory movements of the ribbon are controlled by a reciprocating ribbon carrier or vibrator 30 which is preferably made of thin sheet metal and comprises a stem 31, a cross-head 32, and a pair of slides 33 carried at the ends of the cross head. The two arms composing the cross head are folded back upon themselves at 34 and the slides 33 are thereby turned toward each other, their lower portions extending below and their upper portions, above the cross head. The ribbon, which passes behind the carrier or vibrator and between it and the platen, is threaded through guiding slots 35 formed upon the enlarged laterally arranged upper portions 33<sup>a</sup> of the vibrator slides 33, said slots being preferably open near their tops as indicated at 35<sup>a</sup> so as to facilitate the insertion and withdrawal of the ribbon. The outer walls of the slots 35 are formed by guard fingers 36 which extend upwardly in rear of the ribbon, and the inner boundaries or walls of said slots are provided by small anti-friction rolls or devices 37, the ends whereof terminate in conical pivot portions which are received in bearings 38. The bearings 38, as best appears in Figs. 3 and 4, are preferably made integral with the slide portions of the carrier and produced in the enlargements or heads 33<sup>a</sup> by bending or twisting out lugs or tongues 38<sup>a</sup> at the tops and bottoms of the slots 35 and thereafter curling said lugs in such wise as to produce ring-like bearings for the conical ends of the rolls 37. The ribbon is prevented from being displaced upwardly by hooks or projections 39 formed at the tops of the slide heads 33<sup>a</sup> and when threaded in place through the slots 35 extends across the ribbon carrier behind the slide heads 33<sup>a</sup> and parallel with the platen, but contacting with said carrier, between the slots 35, only through the rolls 37, around which the ribbon bends and is guided at obtuse angles, thereafter continuing forward and outward to the ribbon spools. As will be noted from Figs. 4 and 5 the rolls or rotary devices 37 project rearward beyond the rear face of the upper portion of the vibrator so that the ribbon as it passes behind the vibrator may engage with the rolls without sliding over the vibrator face. The guiding slots herein shown are arranged diagonally in the ribbon carrier or vibrator and the rolls 37 are also arranged diagonally and parallel with the slots of which they form the inner edges. This arrangement is preferred, since it has been found in practice that owing to the increased spread of the lower portions of the slots, caused by their divergence, the objectionable slack at the lower edge of the ribbon, as commonly found in ribbon carriers or vibrators having parallel slots, is taken

up, and the longitudinal tension is rendered substantially even throughout the width of the ribbon. I do not desire, however, to be limited to the particular arrangement of the slots shown in the drawings; any other angle of divergence of the slots may be used or the slots and rolls may be parallel if such arrangement is desired.

The inner edges of the slide portions 33 of the vibrator are adapted to engage slots formed in the upright arms 40 of a guide member 41 secured to the frame of the machine by headed screws 42. The lower end of the stem 31 of the ribbon carrier is pivotally connected at 43 with the forward end of an operating lever 44 fulcrumed at 45 in a lug 46 depending from the top plate. The rear end of the operating lever is connected by a link 47 with the arm 21 of the universal bar frame.

Each depression of a key lever operates the associated type bar and swings the universal bar 22 downward, causing the escapement elements to co-act to feed the carriage and acting through the link 47 and operating lever 44 to lift the ribbon carrier or vibrator 30 so as to interpose the ribbon between the type on the type bar and the paper on the platen.

I have shown my invention embodied in a typewriting machine bearing a general resemblance to one form of the Monarch typewriter, although differing in some details from that machine, but it is, of course, to be understood that said invention may be applied to machines of other constructions employing ribbon carriers which move the ribbon back and forth to cover and uncover the printing point.

It is further to be understood that various constructional changes may be effected in the device without departing from the scope of my invention. One example of such changes is shown in Figs. 6, 7 and 8 of the drawings. In the form of the device illustrated in said figures, the conical ends of the rolls 37 are received in perforations cut in bearing lugs 48, which lugs are bent out perpendicularly from the sheet metal of which the ribbon carrier or vibrator is made. The bearing holes are coned out to conform to the shape of the conical ends of the rolls 37 which engage in said holes.

By my present invention the ribbon is caused to overhang or ride facewise upon the diverging inner edges of the slots 35 of the ribbon carrier or vibrator. These edges, instead of being corners or surfaces fixed with respect to the other parts of the carrier, as in constructions prior to my present invention, are rotatable in respect of the other parts of the carrier, being formed by anti-friction rolls pivoted in and rotating on the vibrator as the ribbon is fed longitudinally from spool to spool or is vibrated to and

from the printing point on the platen. The ribbon contacts during its ordinary feeding and vibratory movement with the anti-friction rolls only, thereby doing away with the more extended contacts and sharp edges found in prior constructions, which advantage combined with the fact that the contact is a rolling one instead of a sliding one as heretofore, tends to minimize the wear on the ribbon and to cause it to be fed and operated by the expenditure of a minimum amount of power.

Various other changes besides those specified may be made within the scope of my invention.

What I claim as new and desire to secure by Letters Patent, is:—

1. In a typewriting machine, a ribbon vibrator made of sheet metal and having bearing lugs struck from said metal, said lugs provided with conical seats for anti-friction rolls, said rolls having coned ends seated in said conical seats.

2. In a front strike typewriting machine, the combination of a platen, a pair of ribbon spools mounted on opposite sides of the machine forward of the platen, a ribbon

vibrator normally maintaining the ribbon below the printing point and provided with diverging guiding slots, said vibrator being made of sheet metal having lugs struck from the body thereof, and anti-friction rolls coned at their ends and engaging in conical seats in said lugs, said rolls serving as anti-friction bearings for the ribbon.

3. In a typewriting machine, the combination of a pair of ribbon spools mounted at opposite sides of the machine, a ribbon carrier mounted in proximity to the printing point and provided with diagonal slots through which the ribbon is threaded; bearing lugs integral with said vibrator; and diagonally arranged anti-friction rolls pivotally seated in said lugs and serving as bearings for the ribbon.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 8th day of December, A. D. 1910.

JACOB FELBEL.

Witnesses:

E. M. WELLS,  
CHARLES E. SMITH.