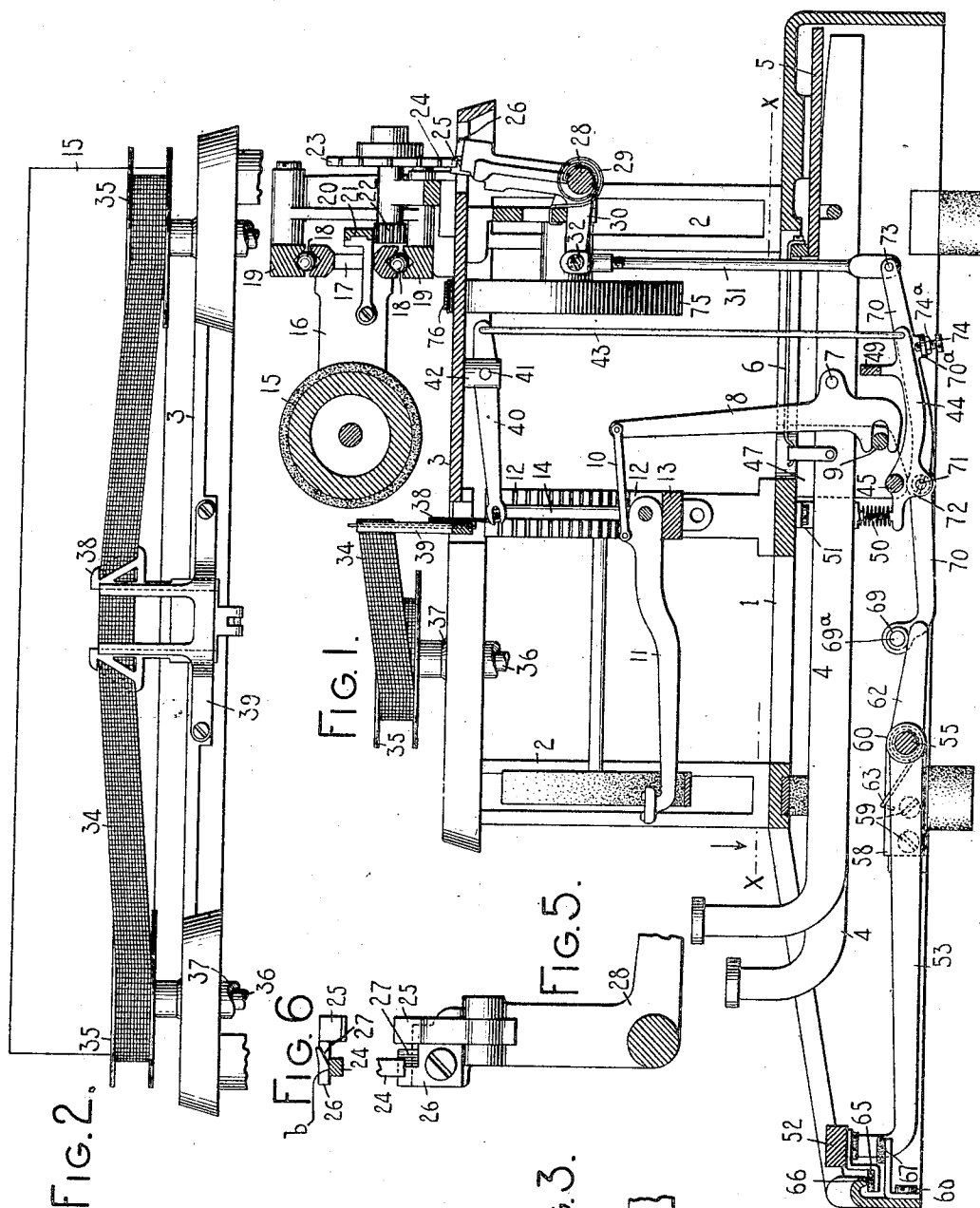


No. 893,422.

PATENTED JULY 14, 1908.

E. E. BARNEY.
TYPE WRITING MACHINE.
APPLICATION FILED JULY 12, 1905.

2 SHEETS—SHEET 1.



WITNESSES:

E. M. Wells.
m. w. Pool

FIG. 4.

FIG. 3.

FIG. 5.

FIG. 1.

FIG. 6.

INVENTOR:

Edwin E. Barney

By Jacob Felbel

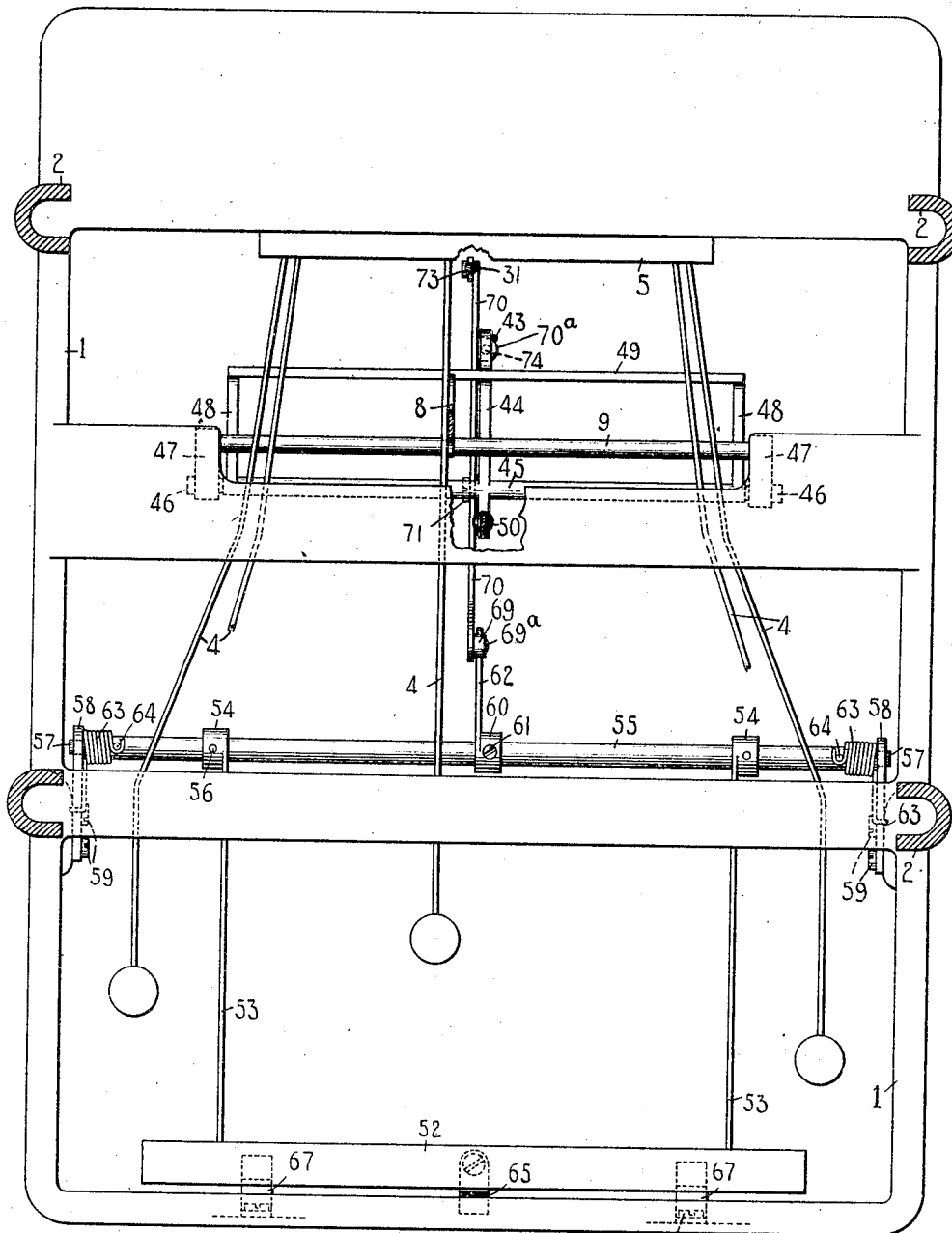
HIS ATTORNEY

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WITNESSES:

E. M. Wells.

M.W. Foad

FIG. 7.

INVENTOR:

Edwin E. Barney

By Jacob Felbel

HIS ATTORNEY

UNITED STATES PATENT OFFICE.

EDWIN E. BARNEY, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE MONARCH TYPEWRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

No. 893,422.

Specification of Letters Patent.

Patented July 14, 1908.

Application filed July 12, 1905. Serial No. 269,359.

To all whom it may concern:

Be it known that I, EDWIN E. BARNEY, citizen of the United States, and resident of Syracuse, in the county of Onondaga 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 more particularly to the means employed in typewriting machines for spacing between words.

Hitherto it has been the custom to so adjust the universal bar relative to the escapement mechanism that the action of both space bar and character keys on said universal bar was the same, and the release of the stepping dog from the tooth of the escapement wheel was effected by a movement of the dog rocker which was of the same extent whether caused by character key or space bar, so that the holding dog moved the same distance into the escapement wheel in both cases. The result was that in constructions wherein the holding dog was provided with an inclined or beveled face and the space bar was usually supported upon two levers of light weight, one pivoted at each side of the keyboard, the depression of the space bar under a slow or hesitating stroke would sometimes cause the beveled face of the dog to strike the tooth of the escapement wheel, and the spring or give of the parts would permit the rocker to be cammed backward. In such prior constructions the carriage was frequently caused to move one or more letter space distances before the space key was released by the operator. Furthermore, in visible writing machines it has hitherto been usual to connect the means for vibrating the ribbon with the universal bar so that the space key or bar, acting on said universal bar, would raise the ribbon to cover the printing point just as said ribbon is raised when a character key is depressed. This vibration of the ribbon by the space bar was a useless operation and one more or less annoying to the operator, especially when the carriage was moved or shifted from one column field to another by the repeated actuation of the space bar as is the practice of some operators.

The main object of this invention is to obviate these defects, my improved construction providing in the first place means whereby the space bar or key operates the escape-

ment mechanism independently of the universal bar, which is operable only by the character keys and in the second place means whereby the ribbon vibrating mechanism is operated independently of the space bar or key. Other objects will subsequently appear.

To the above ends, the invention resides in the features of construction, arrangement of parts and combinations of devices hereinafter fully described and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical front to rear sectional view, taken about centrally, of a typewriting machine embodying my invention, such parts of the machine as are unnecessary to a complete understanding of my improvements being omitted. Fig. 2 is a fragmentary front elevation of the upper part of the machine, certain parts being omitted. Fig. 3 is an enlarged detail side view of the escapement elements, showing their relation when a character key is depressed. Fig. 4 is a top plan view corresponding to Fig. 3, parts being omitted. Fig. 5 is a view similar to Fig. 3 showing the relation of the parts when the space bar or key is depressed. Fig. 6 is a top plan view of Fig. 5, parts being omitted. Fig. 7 is a sectional view taken on a plane represented by the line *x x* in Fig. 1.

In the drawings the frame of the machine is shown as comprising a base 1, corner posts 2 and a top plate 3. Key levers 4 are fulcrumed on a fulcrum plate 5 in the rear of the base, each key lever being provided with a restoring spring 6 and having pivoted to it at 7 a sub-lever 8, the lower end whereof is slotted to cooperate with a fixed abutment 9 and the upper end whereof is connected by a link 10 with a type bar 11. The type bars are circularly arranged, each, as herein shown, being guided in a radial slot 12 formed in a segmental type bar support 13 and being pivotally supported on a fulcrum rod 14 seated in a groove cut in the top of said segment 13. Any other known method of supporting the type bars on the segment may be employed; and said segment, though it is preferably connected with a known form of shifting mechanism, may be either of the shiftable or nonshiftable kind.

The type bars are designed to be moved upwardly and rearwardly to cooperate with the front face of a rotary cylindrical platen 15

mounted in a carriage 16, the rear bar 17 whereof is grooved longitudinally to receive antifriction balls 18 which also cooperate with grooved guide ways 19 secured to brackets 20 fixed to the top plate of the machine. A rack 21 is supported in the carriage and normally meshes with a feed pinion 22 operably connected with an escapement wheel 23, the teeth 24 whereof cooperate with a pivoted feed or stepping dog 25 and a fixed or holding dog 26 which last has a working face formed with a bevel 27. The dogs 25 and 26 are carried at the top of a pivoted dog rocker 28 provided with a restoring spring 29 and having a horizontally disposed arm 30. An adjustable link 31 is pivotally connected at 32 with the free end of the arm 30 of the dog rocker 28, the lower end of said link 31 being operably connected in a manner presently to be described with the printing keys and the space bar.

An ink ribbon 34 is wound upon and has its ends connected to ribbon spools 35 arranged one at each side of the machine above the top plate and forward of the platen 15. The ribbon spools are suitably secured at the tops of vertically disposed shafts 36 adapted to be turned in fixed bearings 37 by a known construction of ribbon feeding mechanism. Between the spools the ribbon 34 is threaded through a ribbon carrier or vibrator 38 guided and supported in a bracket 39 and connected at its lower end with the forward arm of an operating lever 40 pivoted at 41 in a lug 42 depending from the top plate of the machine. A link 43 is connected at its upper end with the operating lever 40 and at its lower end with an arm 44, extending rearwardly from the center of a rock shaft 45 having pivot bearings 46 secured in brackets 47 depending from the top of the base 1. Arms 48 are secured to the rock shaft 45 near its ends and extend towards the rear, their free ends being connected by a universal bar 49 which is also connected midway of its length with the central rearwardly extending arm 44. The rock shaft 45, arm 44, arms 48 and universal bar 49 comprise a universal bar frame which vibrates about the pivots 46 and underlies the rear portions of all of the series of key levers 4, the side members of the series of key levers having a lateral inclination and being offset laterally and outwardly forward of the pivots 46, as best appears in Fig. 7. The rear end of the arm 44 extends somewhat behind the universal bar 49 and the front end of said arm extends somewhat forward of the rock shaft 45, said forward arm cooperating with a coiled restoring spring 50, disposed between the arm 44 and a bracket 51 depending from the base 1.

The parts hereinbefore described are substantially similar in construction and arrangement to those of the structure commercially known as the Monarch typewriter,

though differing somewhat in detail from that machine, and it is, therefore, not deemed necessary to describe them with any greater degree of particularity. It is to be understood, however, that although I have shown my invention as applied to the Monarch typewriter, said invention may be adapted to any other writing machine suitable for the purpose.

A space bar or key 52, preferably of wood, is arranged at the front of the base and forward of the character keys, being secured at the forward ends of a pair of arms 53. The rear ends of the arms 53 are formed with collar portions 54 which are perforated to receive a rock shaft 55 to which said collar portions are suitably secured as by rivets 56. The ends 57 of the rock shaft are reduced in diameter and are received in perforations in bearing brackets 58, said brackets being secured by screws 59 to the side walls of the base 1. Centrally of the rock shaft 55 is a collar 60 secured to said rock shaft by a set screw 61, and integral with said collar is a rearwardly extending arm 62. Springs 63 are coiled around the ends of the rock shaft 55, one end of each of said springs engaging with a pin 64 fixed in the rock shaft and the other end of each spring hooking over one of the brackets 58. A buffer or limiting stop 65 is secured to the under side of the space bar 52 at about its center and the springs 63 maintain said buffer normally in contact with an overhanging lip 66 on the front of the base 1. The positions in which the space bar 52, the arms 53 and the arm 62 are normally maintained by the coiled spring 63 are shown in Fig. 1. Cushioned limiting stops 67 are secured to the front of the base by screws 68 and serve to limit the downward movement of the space bar 52.

Arranged above and in contact with the arm 62 near its free end is a small anti-friction roll or wheel 69 pivoted on a headed pin 69^a projecting laterally from the forward end of a lever 70, which lever is fulcrumed on a pivot screw 71 secured in a lug 72 extending downwardly from the central arm 44 of the universal bar frame. The pivot screw 71 is directly beneath the rock shaft 45, and the construction is such that the rock shaft 45 is not effected by the movement of the lever 70. The rear end of the actuating lever 70 is pivotally connected at 73 with the lower end of the link 31. Between the pivot 73 and the pivot 71 the rear arm of the actuating lever 70 is formed with a laterally projecting ledge or lip 70^a which underlies the arm 44 near the rear end of the latter. The lip 70^a is formed with a threaded perforation which receives a contact screw 74, the end whereof stands normally beneath the under edge of the arm 44, so that when said arm is slightly depressed it will contact with the screw. The screw 74 is provided with a

lock nut 74^a and is adjustable so that the arm 44 may engage it at different points in the travel of said arm.

From the above description it will be understood that when any one of the printing key levers 4 is adequately depressed, the type bar 11 which is connected with said key lever through the link 10 and sub-lever 8, will be moved unwardly and rearwardly in a known manner to cooperate with the front face of the platen 15. As the key lever 4 swings downwardly its under edge contacts with the universal bar 49, swinging the latter downwardly about the pivots 46 and causing the ribbon vibrator 38, which is connected with said universal bar through the operating lever 40, link 43 and arm 44, to move upwardly and interpose the ribbon between the front face of the platen and the type on the actuated type bar.

It will be recalled that the rear end of the arm 44 of the universal bar frame is normally slightly above the contact screw 74 on the actuating lever 70. Consequently as the arm 44 is swung downwardly about the pivots 46 it contacts with the screw 74 and swings the rear arm of the actuating lever 70 downward, thereby causing the link 31 to actuate the dog rocker 28. The dog rocker swinging forward will move the stepping dog 25 forwardly out of engagement with the tooth 24 of the escapement wheel 23 and will cause the holding dog 26 to engage with the same tooth of the escapement wheel in the manner indicated in Figs. 3 and 4, wherein it will be noted that the rear or holding dog 26 enters the escapement wheel far enough to bring the beveled face 27 just past the rear edge of the tooth 24, the depth of contact on the flat of the dog being indicated in Fig. 4 by the reference character *a*. It is to be understood that each key lever 4 of the series of printing key levers is so adjusted in respect of the universal bar 49 that the dog rocker will be swung forwardly the same distance when the key is fully depressed and the holding dog 26 will have the same depth of contact *a* with the tooth 24 of the escapement wheel when actuated by any one of the key levers. From an inspection of Fig. 1, it will be seen that the key lever therein shown will be moved downwardly some distance before it contacts with the universal bar 49 so that the latter will remain quiescent during the first portion of the stroke of the key lever. It is by regulating the space which normally exists between the under edge of each key lever and the top of the universal bar that the uniformity above referred to in the forward movement of the dog rocker is obtained. Furthermore, the universal bar will in turn be moved some little distance before it contacts with the screw 74 and starts the dog rocker forward. As is well understood this gradual taking up of the load by

the key lever after said lever has itself acquired momentum conduces to an advantageous key touch.

When the depressed key lever is released the dog rocker will be restored to normal position under the influence of the dog rocker spring 29, which, acting through the link 31 on the lever 70, tends to restore the latter to normal position with the roll 69 in contact with the arm 62. The universal bar frame is restored to normal position by the restoring spring 50 and as it returns acts on the ribbon vibrator 38 through the lever 40 and link 43 and restores said vibrator to its normal position. It will be noted that during the movements of the actuating member or lever 70 under the influence of the universal bar 49, the roll 69 on the forward end of said lever 70 first moves upward, separating from the lever arm 62, and then downward again into contact with said lever arm, and during the movement of the roll 69 and the lever 70 the arm 62 and the other parts positively connected with the space key or bar will remain quiescent.

When the space key or bar 52 is adequately depressed the space key frame, comprising the bar 52, the side lever arms 53, the rock shaft 55 and the rearwardly projecting arm 62, will be actuated, the parts moving about the longitudinal axis of the rock shaft 55 as a center, the lever arms 53 swinging downward about said axis and the arm 62 upward. As the arm 62 starts upward it acts on the roll 69 which is normally in contact with it and thereby actuates the lever 70, causing the rear arm of said lever to pull down the link 31 and rock the dog rocker 28 forward. The parts are so proportioned and adjusted that the dog rocker will be swung forward until the beveled face 27 of the rear dog 26 has wholly entered the escapement wheel and the tooth of said escapement wheel will contact with the straight face of said rear dog to a depth indicated by the reference character *b* in Fig. 6.

It will be apparent from an inspection and comparison of Figs. 5 and 6 with Figs. 3 and 4 that the forward extent of movement of the dog rocker under the actuation of the space key or bar will be greater than the forward movement under the actuation of the printing keys. When the space bar is actuated the rear dog enters the escapement wheel far enough to bring the plain or flat working face of said dog well in contact with the escapement wheel tooth, so that even under a slow stroke the flat face of the rear dog will contact with the wheel tooth and there is no tendency to cam the dog rocker rearwardly as there would be if the rear dog landed with its bevel in contact with the tooth as sometimes happens under a slow stroke. The consequence is that although the space bar or key and its frame are very light and although

there is considerable spring or give in the parts comprising them, the greater depth of contact *b* affords a margin of safety such that though the space bar or key be held down, there will be no tendency on the part of the carriage to move rapidly leftward under the influence of the usual carriage power or spring drum 75 with which said carriage is connected by band or strap 76 in a known manner. When the space key is released, it and the space key frame will be returned to normal position by the restoring springs 63, and the arm 62 as it moves downward will permit the actuating lever 70 to be moved back also to normal position along with the dog rocker under the influence of the dog rockerspring 29.

It will be observed that during the actuation of the lever 70 by the space bar the screw 74 on the lever 70 moves downwardly away from the arm 44 of the universal bar frame, so that the latter remains quiescent, and consequently the ribbon vibrator 38 will also remain quiescent and the ribbon will not be vibrated.

By my invention I provide escapement devices which are operated by an actuating member or lever 70 which in turn is operated by duplex means, one of said duplex means comprising a space bar or key 52 and the frame on which it is mounted, said frame being composed of the arms 53, rock shaft 55 and arm 62, and the other of said duplex means comprising the universal bar frame and the printing key levers which are adapted to actuate the universal bar 49 forming part of said universal bar frame. One of the duplex means, comprising the lever arm 44, is operative upon the actuating lever 70 near one of its ends and the other of the duplex means, comprising the lever arm 62, is operative upon the actuating lever near its other end. It will be noted that when either of said duplex means is operated, the other of the duplex means remains quiescent and inoperative and that when the means operative by the space key is actuated the ribbon vibrator and the ribbon remain in normal position below and away from the printing point on the platen. The carriage spacing devices, it will be noted, comprise a pivoted member or dog rocker and the extent of movement of said pivoted member or dog rocker under the influence of one of the key operated duplex means is different from the extent of such movement when the other of said key operated means is employed.

Various changes may be effected in the construction and arrangement of the parts within the scope of my invention.

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

1. In a typewriting machine, the combination of printing keys; a space key; carriage feeding devices including a pivoted member; duplex means for moving said pivoted mem-

ber, one of said duplex means being operative by the space key and the other by the printing keys, the extent to which said pivoted member is moved by one of said duplex means differing from the extent to which it is moved by the other of the duplex means.

2. In a typewriting machine, the combination of printing keys; a space key; carriage feeding devices including a dog rocker; duplex means for rocking said dog rocker, one of said duplex means being operative by the space key and the other by the printing keys, the extent to which said dog rocker is rocked by one of said duplex means differing from the extent to which it is rocked by the other of the duplex means.

3. In a typewriting machine, the combination of a ribbon vibrator, carriage feeding devices, a member adapted to actuate said devices, means including a universal bar for operating said member, said means being also operative on said ribbon vibrator, and other means for operating said member, said last mentioned means being inoperative to move said vibrator to the printing point.

4. In a typewriting machine, the combination of carriage feeding devices including a dog rocker; an actuating lever; connections between said actuating lever and said dog rocker; a space key operative on said actuating lever; a universal bar frame operative directly on said actuating lever; and printing keys operative on said universal bar.

5. In a typewriting machine, the combination of a ribbon vibrator; carriage feeding devices including a dog rocker; an actuating lever; connections between said actuating lever and said dog rocker; a lever arm operative upon said actuating lever near one of its ends; and another lever arm operative upon said actuating lever near its other end, one of said lever arms being also operative upon said ribbon vibrator.

6. In a typewriting machine, the combination of printing keys; a pivoted universal bar frame operative by said printing keys; an actuating lever fulcrumed on said universal bar frame; carriage feeding devices; and connections between said carriage feeding devices and said actuating lever.

7. In a typewriting machine, the combination of printing keys; a pivoted universal bar frame operative by said printing keys; an actuating lever fulcrumed on said universal bar frame; carriage feeding devices; connections between said carriage feeding devices and said actuating lever; and a space key operative upon said actuating lever.

8. In a typewriting machine, the combination of printing keys; a pivoted universal bar frame operative by said printing keys; an actuating lever fulcrumed on said universal bar frame; carriage feeding devices; connections between said carriage feeding devices and said actuating lever; a rock shaft; 130

lever arms projecting forwardly therefrom; a space bar connecting said lever arms; and a lever arm projecting rearwardly from said rock shaft and operative upon said actuating lever.

9. In a typewriting machine, the combination of a rock shaft; lever arms projecting therefrom; a universal bar secured to said lever arms; printing keys operative on said universal bar; a ribbon vibrator; connections between said ribbon vibrator and one of said lever arms; an actuating lever; connections between said actuating lever and one of said lever arms; carriage feeding devices; and connections between said carriage feeding devices and said actuating lever.

10. In a typewriting machine, the combination of a rock shaft; lever arms projecting therefrom; a universal bar secured to said lever arms; printing keys operative on said universal bar; a ribbon vibrator; connections between said ribbon vibrator and one of said lever arms; an actuating lever; connections between said actuating lever and one of said lever arms; carriage feeding devices; connections between said carriage feeding devices and said actuating lever; a second rock shaft forward of the first rock shaft; lever arms projecting from said second rock shaft; a space bar connecting said lever arms; and a lever arm projecting oppositely from said second rock shaft and operative upon said actuating lever.

11. In a typewriting machine, the combination of a rock shaft; lever arms projecting therefrom; a universal bar secured to said lever arms; printing keys operative on said universal bar; a ribbon vibrator; connections between said ribbon vibrator and one of said lever arms; an actuating lever; connections between said actuating lever and one of said lever arms; carriage feeding devices; connections between said carriage feeding devices and said actuating lever; a second rock shaft forward of the first rock shaft; lever arms projecting from said second rock shaft; a space bar connecting said lever arms; a lever arm projecting oppositely from said second rock shaft and operative upon said actuating lever, the parts being so arranged that when the space bar is operated the ribbon vibrator is inoperative but when the printing keys are operated they act to operate the ribbon vibrator.

12. In a typewriting machine, the combination of a space key; a rock shaft operated thereby; a lever arm on said rock shaft; a pivoted universal bar frame; an actuating lever operative by said lever arm; carriage feeding devices operative by said actuating lever; a ribbon vibrator operative by said universal bar frame; and printing keys operative on said universal bar frame to actuate said ribbon vibrator and said carriage

feeding devices, said space bar being inoperative upon said ribbon vibrator.

13. In a typewriting machine, the combination of a key operated pivoted universal bar frame; an actuating lever fulcrumed on said universal bar frame and operative by said frame; carriage feeding devices operative by said actuating lever; and separate key actuated means operative upon said actuating lever and inoperative to move said universal bar frame.

14. In a typewriting machine, the combination of a key actuated pivoted universal bar frame; a ribbon vibrator; connections between said vibrator and said universal bar frame; an actuating lever fulcrumed on said universal bar frame; carriage feeding devices; connections between said carriage feeding devices and said actuating lever; a space bar; connections between said space bar and said actuating lever whereby said actuating lever may be operated while said universal bar frame and said ribbon vibrator remain quiescent.

15. In a typewriting machine, the combination of a platen carrier; an escapement wheel operatively connected therewith; a dog rocker carrying escapement dogs adapted to co-act with said escapement wheel; a universal bar rock shaft; arms extending therefrom and carrying a universal bar; a ribbon vibrator connected to operate with the universal bar; an actuating lever fulcrumed on one of said arms and having a part adapted to contact with said arm; a space key rock shaft; an arm projecting therefrom and normally in contact with said actuating lever; lever arms projecting forwardly from said rock shaft; and a space key or bar secured to the forward ends of said lever arm.

16. In a typewriting machine, the combination of a platen carrier; an escapement wheel operatively connected therewith; a dog rocker carrying escapement dogs adapted to co-act with said escapement wheel; a universal bar rock shaft; arms extending therefrom and carrying a universal bar; a ribbon vibrator connected to operate with said universal bar; an actuating lever fulcrumed on one of said arms and having a part adapted to contact with said arm; a space key rock shaft; an arm projecting rearwardly therefrom; arms projecting forwardly therefrom and connected by a space key or bar at their forward ends; and springs adapted to maintain said rearwardly projecting arm and said actuating lever normally in contact with each other.

17. In a typewriting machine, the combination of a key actuated universal bar frame; a space key; carriage feeding devices; and an actuating lever therefor pivoted to said universal bar frame and provided on one arm with an adjustable contact screw and pro-

vided on the other arm with an anti-friction roll; the universal bar frame being operative on the contact screw and the space key being operative on the anti-friction roll.

- 5 18. In a typewriting machine, the combination of a paper carriage, letter feeding devices therefor; printing mechanism including a series of key levers; a universal bar arranged beneath the key levers; a ribbon vibrator; connections between the ribbon vibrator and the universal bar; a lever con-
- 10

nected to certain of the letter feeding devices and adapted to be actuated by the universal bar; and a space key also adapted to actuate said lever independently of the universal bar. 15

Signed at Syracuse, in the county of Onondaga, and State of New York, this 5th day of July A. D. 1905.

EDWIN E. BARNEY.

Witnesses:

W. J. LOGAN,
H. A. CUMENT.