No. 837,032. PATENTED NOV. 27, 1906.

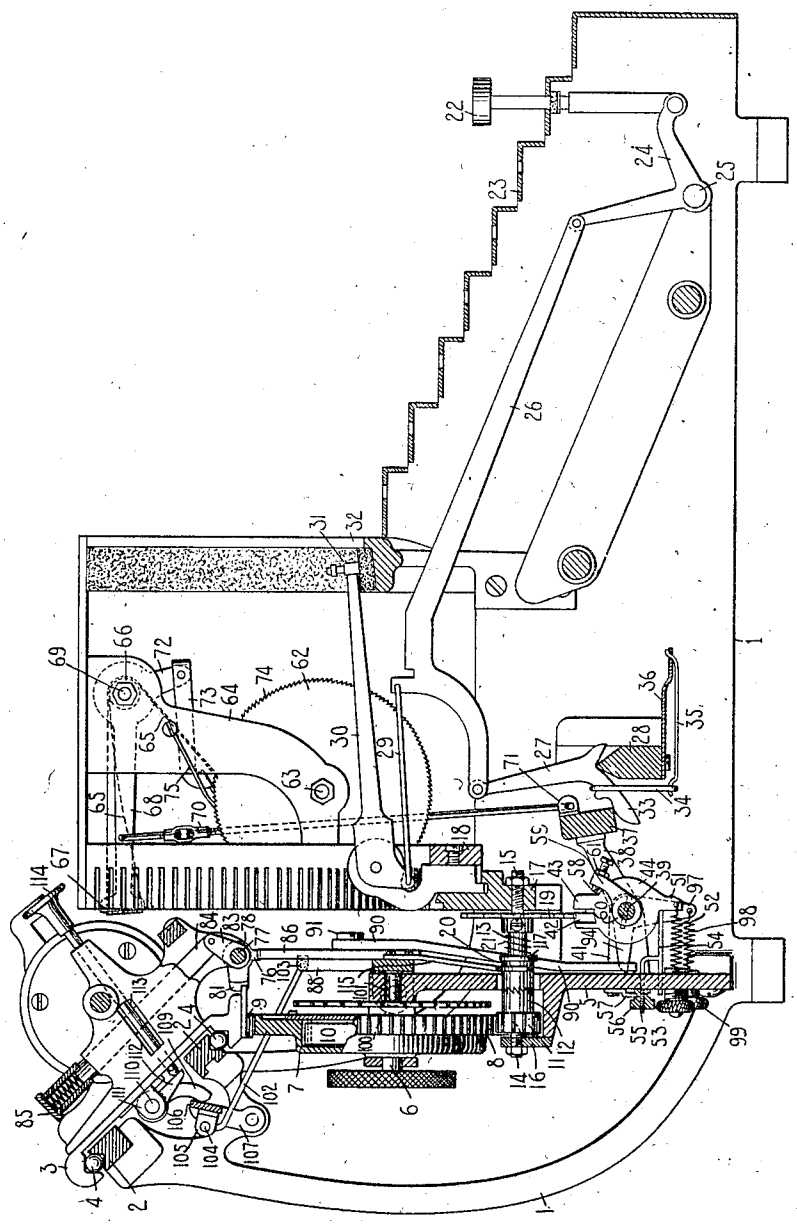
A. T. BROWN.

TYPE WRITING MACHINE.

APPLICATION FILED JUNE 4, 1904.

3 SHEETS—SHEET 1.

FIG. 1.



WITNESSES.

E. M. Wells.

J. B. Deeves.

INVENTOR:

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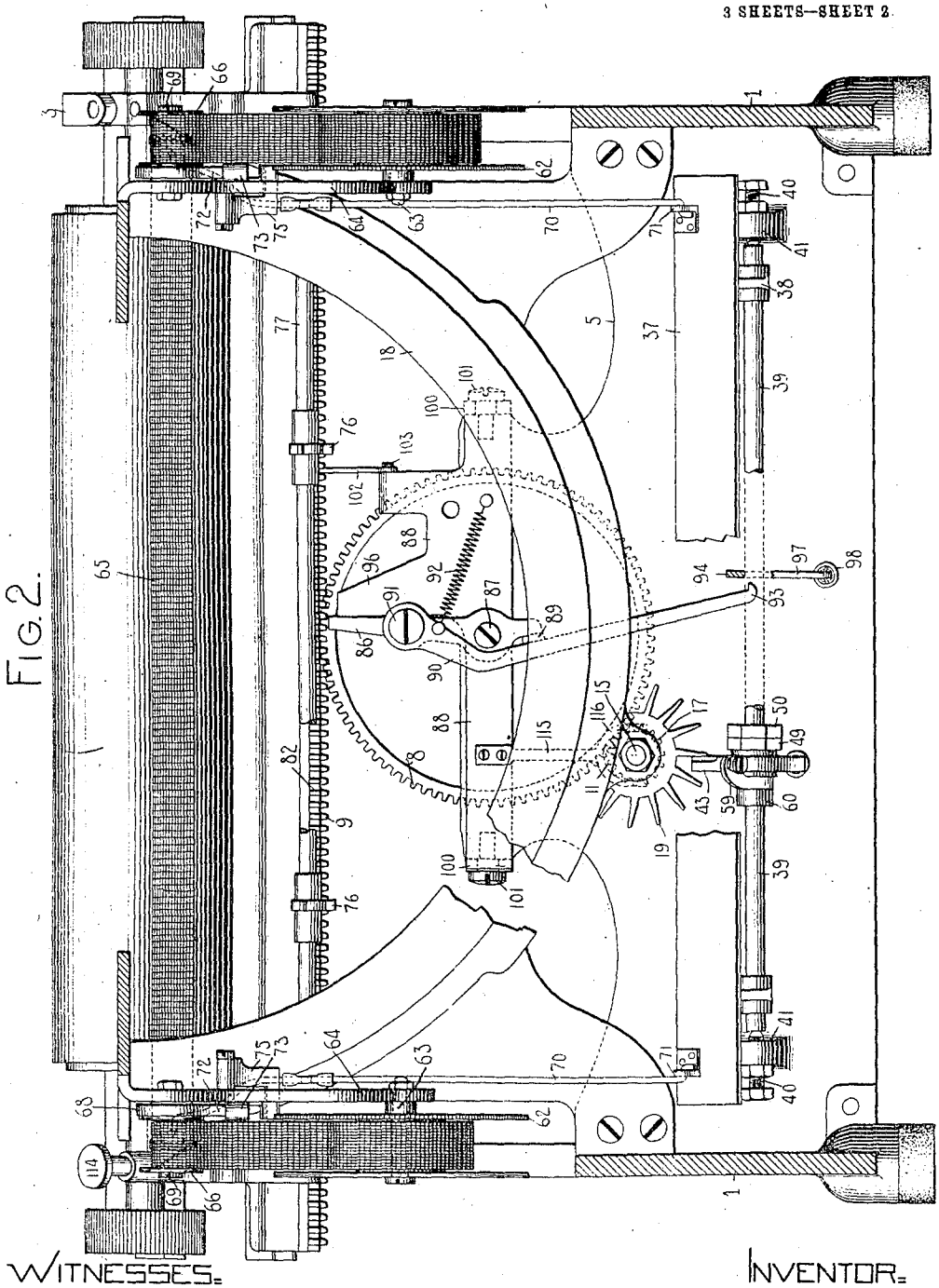
3 SHEETS—SHEET 2.

FIG. 2.



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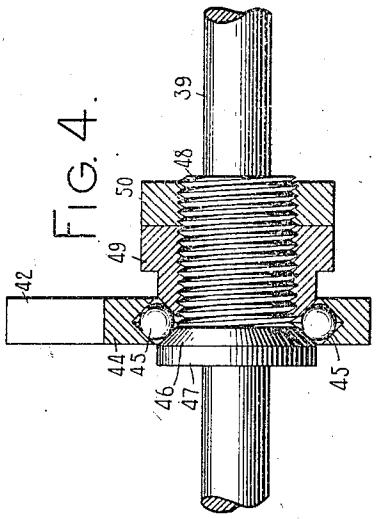

FIG. 4.

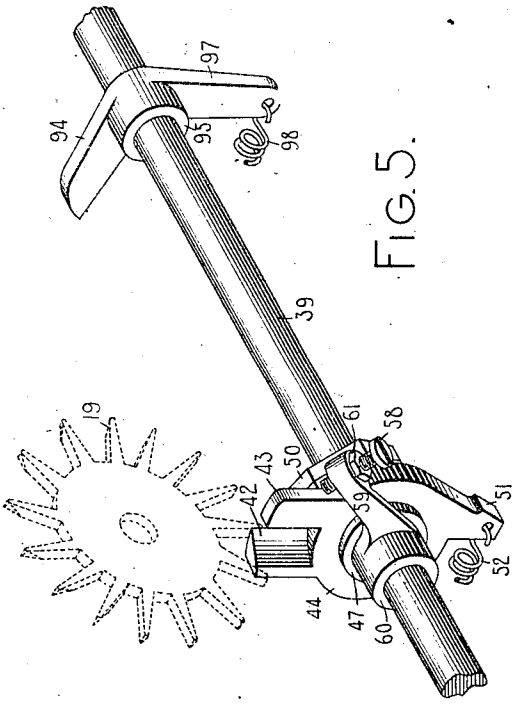

FIG. 5.

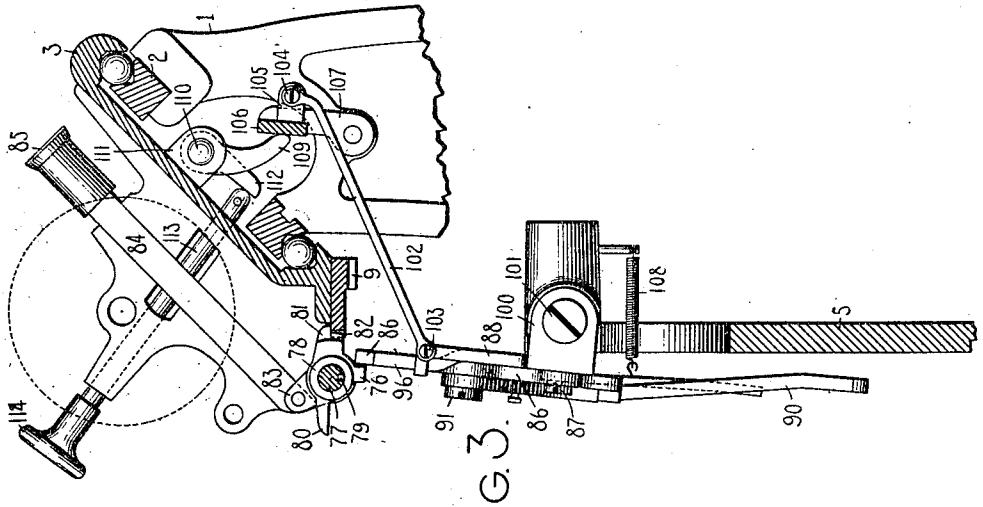

FIG. 3.

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UNITED STATES PATENT OFFICE.

ALEXANDER T. BROWN, OF SYRACUSE, NEW YORK.

TYPE-WRITING MACHINE.

No. 837,032. Specification of Letters Patent. Patented Nov. 27, 1906.

Application filed June 4, 1904. Serial No. 211,127.

To all whom it may concern:

Be it known that I, ALEXANDER T. BROWN, a citizen of the United States, and a 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 to type-writing machines, and more especially to certain combinations of line-lock mechanism, ribbon-vibrator mechanism, and escapement mechanism.

By the present invention the escapement is so connected to the keys that its operation does not begin until after a key has completed a certain portion of its stroke, and the point in the stroke of the key at which the operation of the escapement begins may be varied. Notwithstanding this variation the ribbon-vibrator makes its complete reciprocation and the line-lock operates to lock the key in its normal position even though there may be a considerable amount of lost motion between the key and the escapement.

In the accompanying drawings, Figure 1 is a vertical sectional view of a type-writing machine in which my invention is embodied, the section being taken from front to rear of the machine. Fig. 2 is a front elevation, a portion of the machine being sectioned away. Fig. 3 is a view of part of the line-lock mechanism, partly in section. Fig. 4 is an enlarged detail view showing the ball-bearings for the feed-dogs, and Fig. 5 is a detail perspective view.

The framework of the machine illustrated in the drawings comprises side plates 1, which at their rear ends extend upward and support grooved rails 2, on which the carriage 3 is mounted by antifriction balls or rollers 4. A back plate 5 connects the side plates 1 and supports a horizontal shaft 6, on which is mounted a spring-drum 7, which is rigidly secured to or forms part of a gear-wheel 8, which meshes with a rack-bar 9, secured to the carriage. A spring 10 in the spring-drum 7 moves the carriage. A pinion 11, having a hub 12, meshes with the gear 8 and is loosely mounted on a shaft 13, which is journaled on pivot-screws 14 and 15, the former of which is threaded through a bracket 16, projecting from the back plate 5. The screw 15 is threaded through an ear 17, depending from the type-bar segment 18, which is rigidly connected at its ends to the side plates 1. An escapement-wheel 19 is fixed to the shaft 13. A sleeve 20 is splined to said shaft and is formed on one end with ratchet-clutch teeth, which mesh with like teeth formed on the end of the hub 12 of the pinion 11. The sleeve 20 is pressed toward the hub 12 by a spring 21, compressed between said sleeve and the hub of the escapement-wheel. The keys 22 have their stems projecting through and guided by plates 23, secured at their ends to the side plates 1 of the main frame. The key-stems are pivotally connected at their lower ends to the forwardly-extending arms of bell-crank levers 24, which are pivoted on frame-rods 25 and which have upwardly-extending arms connected by links 26 with secondary levers 27, which are pivotally mounted on a bar 28, which is secured at its ends to the side plates 1. The links 26 are connected by links 29 with the type-bars 30, which rest at their forward ends on a pad 31, supported by a segment 32, which is connected to the side plates 1.

Each of the levers 27 has a downwardly and rearwardly extending arm 33, which is connected by a link 34 to a spring 35, supported by a plate 36, secured to the bar 28. The construction is such that the spring 35 tends to draw the lever-arm 27 toward the back of the machine and to hold the key 22 in its normal position. A universal bar 37 lies over all of the lever-arms 33 of the series and lies in position to be actuated by any one of them.

The universal bar is mounted on arms 38, the hubs of which are rigidly fixed on a rock-shaft 39, which is pivoted on pivot-screws 40, Fig. 2, said screws being threaded through lugs or ears 41, projecting forward from the back plate 5. As will be understood by reference to Figs. 4 and 5, the feed-dogs 42 and 43 are both rigid and are mounted by ball-bearings directly on the rock-shaft 39. Said dogs, as here shown, are integral with a plate 44, the internally-grooved eye of which constitutes a ball-race in which are antifriction-balls 45. The other member of the ball-bearing consists of the conical surface 46, of a flange 47, formed on a threaded screw 48, and the conical surface of a nut 49, threaded on said sleeve. This bearing may be adjusted by tightening or loosening the nut 49, which is held in its adjusted position by a lock-nut 50.

An arm 51 depends from the plate 44 and

has connected thereto one end of a spring 52, the other end of which is connected to an adjusting-screw 53, threaded through the back plate 5. The spring 52 tends to draw the arm 51 toward the back of the machine, and this motion of said arm is limited by the end of a rod 54, which passes loosely through an opening in the back plate 5 and which is formed with an arm 55, which also passes through said back plate and has threaded thereon a milled nut 56, which is held against endwise motion by a plate 57, which is secured to the back plate 5 and which projects into an annular groove in the hub of the milled nut.

The tension of the spring 52 may be regulated by adjusting the screw 53, and the position in which the stop-rod 54 arrests the arm 51 and the escapement-dogs may be regulated by adjusting the milled nut 56.

The dogs are moved toward the back of the machine when the universal bar is operated by the depression of a key by the end of a screw 58, which is threaded through an arm 59, which projects from a hub 60, which is fixed on the shaft 39. The point in the depression of a key and in the consequent motion of the universal bar at which said universal bar begins to operate the escapement-dogs may be varied by adjusting the screw 58 so that its end normally rests nearer to or farther from the dog 43, and this screw may then be fixed in its adjusted position by tightening the lock-nut 61.

It is contemplated that the screw 58 be so adjusted as to leave a considerable amount of lost motion between the universal bar and the escapement, so that the work of moving the escapement is slight and does not come upon the key until after the type-bar and other parts have acquired a considerable momentum. It will be perceived that by adjusting the milled nut 56 and the screw 58 both the extent of motion of the feed-dogs and the amount of lost motion between the universal bar and said feed-dogs may be regulated.

The ribbon-spools 62 are loosely mounted on rods 63, which are secured to brackets 64, which are rigidly connected to or form part of the main frame. The ribbon 65 is guided from one spool over a roller 66 and thence toward the back of the machine over a guide-plate 67, from which it is led horizontally in front of the platen to a similar guide-plate on the other side of the machine and over another roller 66 and back to the other spool. The guide-plates 67 are mounted on the ends of arms 68, which are pivoted on rods or bolts 69, on which the rollers 66 are also journaled. Each of the arms 68 is pivotally connected to the upper end of a link 70, the lower end of which is pivoted to an ear 71, projecting from the universal bar. The construction is such that the guides 67 normally hold the horizontal portion of the ribbon 65 below the printing-point; but the ribbon is raised until it covers the printing-point when the universal bar is operated by the depression of the key. Each of the arms 68 has connected thereto an arm 72, to which is pivoted a feed-pawl 73, which engages ratchet-teeth 74, formed on the periphery of one of the flanges of the ribbon-spool. A retaining-pawl 75 also engages said ratchet-teeth. Any suitable means may be provided for causing one of the feed-pawls and retaining-pawls to engage one of the ribbon-spools and to leave the other ribbon-spool free of its pawls.

The line-lock mechanism comprises a line-stop 76, which is adjustable along a rod 77, which is mounted on the carriage. The line-stop 76 consists of a lug depending from a sleeve 78, which is loose on the rod 77, but has a spline which runs in a groove 79 in said rod, Fig. 3, so that the sleeve may be slid along the rod, but cannot turn thereon. The sleeve 78 is moved along the rod by a handle 80, projecting therefrom, and it is held in adjusted position by a tooth 81, which enters between the teeth of a rack 82, which is fixed to the carriage. The tooth 81 normally engages the rack 82, but may be disengaged therefrom for the purpose of adjusting the stop by rocking the shaft 77. To this end said shaft has fixed thereto an arm 83, to which is pivoted a push-bar 84, which carries on its end a handle or key 85, by depressing which the shaft 77 may be rocked and the tooth 81 freed from the rack, thus leaving the stop 76 free to be adjusted to any desired letter-space position. The stop with which the stop 76 coöperates is the end of a lever 86, which is pivoted at 87 to a rock-frame 88. The lever 86 is prolonged below its pivot and has thereon a lug 89. An arm 90 is pivoted to the lever 86 at 91, and said arm is normally drawn against the lug 89 by a spring 92, which is connected at one end to the arm 90 and at the other end to the rock-frame 88. The arm 90 is extended downward to a point behind the rock-shaft 39, where it is formed into a hook or latch 93, which normally stands just out of the path of an arm 94, the hub 95, Fig. 5, of which is fixed on the rock-shaft 39. The construction is such that when in the travel of the carriage the stop 76 engages the end of the lever 86 said lever will be rocked about its pivot 87 and the arm 90 will also be rocked with the lever about the pivot 87. If at this moment the universal bar and the arm 94 happen to be standing in normal position, the latch 93 will move under the arm 94 and lock the universal bar. If, however, the universal bar be not in its normal position, the latch 93 will be pressed against the side of the arm 94 and will snap under said arm when it returns to normal position.

It will be observed that the arm 86 is free to be moved a considerable distance before the hook 93 arrests the arm 94, in which case the arm 86 would move about its pivot 87 and the upper end of the arm 90 would move with said arm 86, turning about its pivot 91. It will be understood that the spring 92 tends to turn both the arms 86 and 90 about their respective pivots, the motion of the arm 90 under the impulse of said spring being normally limited by the lug 89 and the motion of the arm 86 under the impulse of said spring being normally limited by an upwardly-extending portion 96 of the rock-frame 88. The latch 93 arrests the arm 94 and the universal bar in substantially their normal position. Another arm 97 of the hub 95 has connected thereto one end of a spring 98, the other end of which is connected to a screw 99, having a milled hub and threaded through the back plate 5 of the main frame. The spring 98 tends to restore the universal bar to normal position, and its tension may be varied by adjusting the screw 99.

The rock-frame 88 is somewhat prolonged transversely of the machine, as shown in Fig. 2, and at its ends is formed with ears 100, Fig. 3, which are pivoted on screws 101, threaded into the back plate 5. The frame 88 is thus mounted to rock on a transverse horizontal axis. The motion of said frame about said axis is controlled by a link 102, one end of which is pivoted to the rock-frame at 103 and the other end of which is pivoted at 104 to an ear 105, projecting from a yoke-frame 106, which has at its ends arms 107, which are pivoted to the side plates 1 of the main frame. The rock-frames 88 and 106 are held in normal position by a spring 108 and are rocked by an arm 109, which is fixed to a rock-shaft 110, journaled in ears 111, projecting from the lower side of the carriage. An arm 112, which is fixed to the rock-shaft 110, extends into the path of a rod 113, which is mounted to slide in one of the end pieces of the carriage and has a key or finger-piece 114 on its upper end. If the finger-piece 114 be depressed, the shaft 110 will be rocked and the arm 109 will press the yoke-frame 106 toward the back of the machine and the link 102 will rock the upper portion of the frame 88 toward the back of the machine, thus moving the arm 86 out of the path of the stop 76, as shown in Fig. 3. If this be done when the line-lock is in operative position, the arm 86 will be freed from the stop 76 and will be restored to normal position by the spring 92, thus withdrawing the latch 93 from beneath the arm 94 and unlocking the universal bar, so that additional matter may be written at the end of the line.

An arm 115, secured to the rock-frame 88, extends downward therefrom and has its lower end forked, as shown in Fig. 2, at 116, said fork embracing the sleeve 20, which is splined on the escapement-wheel shaft 13. When the upper portion of the rock-frame 88 is rocked toward the back of the machine by the depression of the finger-piece 114, the arm 115 is moved toward the front of the machine and engages a flange 117, Fig. 1, formed on said sleeve 20, and moves said sleeve against the tension of the spring 21, thus disengaging the clutch connection between the sleeve 20 and the hub 12 of the pinion 11, thus releasing the carriage from the escapement-wheel.

It will be perceived that the universal bar moves with the key throughout the entire stroke thereof, that the ribbon-vibrator moves with the universal bar throughout its entire stroke, and that the line-lock mechanism is arranged to lock the universal bar substantially in its normal position, but that the universal bar does not begin to operate the escapement until said universal bar is moved through a portion of its stroke, the extent of which may be regulated by adjusting the screw 58 and the milled nut 56. In a machine of this character it is desirable that the ribbon-vibrator should move through the whole distance that the universal bar moves through, and it is also advantageous to have a certain amount of lost motion between the universal bar and the escapement mechanism. It is also desirable that the line-lock shall lock the universal bar, and therefore the keys, substantially in their normal position. So far as I am aware it is broadly new to provide a line-lock which thus locks the universal bar in its normal position in combination with an escapement operated by said universal bar, but which does not begin its motion until the universal bar is moved a certain distance from such normal position. The combination of a ribbon-vibrator which is moved by the keys throughout their entire printing stroke, and a line-lock mechanism, which is adapted to lock said keys substantially in their normal position, with an escapement mechanism, which is operated by said keys, but does not begin its operation until a key has made a certain part of its printing stroke, is also broadly new. Neither the type connection nor the key connection, nor the ribbon mechanism, nor the escapement mechanism, nor the line-lock mechanism, nor the carriage-mounting shown and described herein is claimed separately in this application.

The type action herein shown and described is claimed in my application, Serial No. 127,536, filed October 16, 1902, the ribbon mechanism is claimed in my application, Serial No. 127,538, filed October 16, 1902, and the carriage mounting and construction is claimed in my application, Serial No. 305,053, filed March 9, 1906, the latter being a division of my application, Serial No. 127,540, filed October 16, 1902.

When I say that the line-lock locks the universal bar substantially in its normal position, I of course do not mean to say that said universal bar is locked absolutely against any motion whatever.

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

1. In a type-writing machine, the combination with a carriage and type-operating mechanism, of a universal bar, an escapement mechanism operated by said universal bar during part only of the stroke of said universal bar; and a line-lock coöperating with said universal bar to lock the same.

2. In a type-writing machine, the combination with a carriage and type-operating mechanism, of a universal bar; a line-lock coöperating with said universal bar to lock the same; and an escapement mechanism having lost-motion connection with said universal bar.

3. In a type-writing machine, the combination with a carriage and type-operating mechanism, of a universal bar; a line-lock coöperating with said universal bar to lock the same; an escapement mechanism operated by said universal bar; and means for regulating the portion of the stroke of the universal bar during which it moves said escapement mechanism.

4. In a type-writing machine, the combination with a carriage and printing instrumentalities, of a series of keys for operating said printing-instrumentalities; an escapement mechanism operated by any of said keys; a lost-motion connection between the keys and said escapement mechanism; and a line-lock device for locking said keys substantially in their normal position.

5. In a type-writing machine, the combination with a carriage and printing instrumentalities, of a series of keys for operating said printing instrumentalities; a line-lock device for locking said keys substantially in their normal position; an escapement mechanism operated by said keys; and means adjustable to vary the point in the depression of a key at which it begins to operate said escapement mechanism.

6. In a type-writing machine, the combination with a carriage and type-operating mechanism, of a universal bar; a ribbon-vibrator operated by said universal bar; an escapement mechanism operated by said universal bar through a part only of the motion thereof; and a line-lock device coöperating with said universal bar to lock the same.

7. In a type-writing machine, the combination with a carriage and type-operating mechanism, of a universal bar; a ribbon-vibrator operated by said universal bar; an escapement mechanism having lost-motion connection with said universal bar; and a line-lock device arranged to arrest said universal bar before it reaches the point in its motion at which it would begin to operate said escapement mechanism.

8. In a type-writing machine, the combination with a carriage and type-operating mechanism, of a universal bar; a ribbon-vibrator operated by said universal bar throughout substantially the full stroke thereof; an escapement mechanism operated by said universal bar; means adjustable to vary the point in its motion at which said universal bar begins to operate said escapement mechanism; and a line-lock arranged to arrest said universal bar before it reaches the point at which it would begin to operate said escapement mechanism.

9. In a type-writing machine, the combination with a carriage and printing instrumentalities, of a series of keys for operating said printing instrumentalities; a ribbon-vibrator operated by said keys; an escapement mechanism; means adjustable to vary the point in the depression of a key at which it begins to operate said escapement mechanism; and a line-lock device arranged to lock the keys against motion to the point at which a key would begin to operate said escapement mechanism.

10. In a type-writing machine, the combination with a carriage and type-operating mechanism of a universal bar; an escapement mechanism operated by said universal bar; means for regulating the portion of the stroke of the universal bar during which it moves said escapement mechanism; and a line-lock coöperating with said universal bar to lock the same at a point independent of the point at which said universal bar begins to operate said escapement mechanism.

11. In a type-writing machine, the combination with a carriage and printing instrumentalities, of a series of keys for operating said printing instrumentalities; an escapement mechanism operated by said keys; means adjustable to vary the point in the depression of a key at which it begins to operate said escapement mechanism; and a line-lock for locking said keys at a point independent of said variable point.

12. In a type-writing machine, the combination with a carriage and type-operating mechanism, of a universal bar; an escapement mechanism operated by said universal bar; means adjustable to vary the point in its motion at which said universal bar begins to operate said escapement mechanism; a line-lock arranged to arrest said universal bar at an invariable point in its motion; and a ribbon-vibrator operated by said universal bar throughout substantially the entire stroke thereof.

13. In a type-writing machine, the combination with a carriage and type-operating mechanism, of a universal bar; an escapement mechanism operated by said universal bar during the latter part of the positive

stroke thereof; means adjustable to vary the point in the motion of the universal bar at which it begins to operate said escapement mechanism; and a line-lock device coöperating with said universal bar to arrest the same at an invariable point.

14. In a type-writing machine, the combination with a carriage, keys and a universal bar, of a line-lock for locking said universal bar and said keys; and an escapement mechanism comprising feed-dogs having lost-motion connection with said universal bar, means for regulating the extent of such lost motion, and means for regulating the normal position of said feed-dogs.

15. In a type-writing machine, the combination with a carriage, keys and a universal bar, of a ribbon-vibrator, connected with said universal bar so as to be moved therewith throughout substantially the entire stroke thereof; a line-lock for locking said universal bar; and an escapement mechanism comprising feed-dogs having lost-motion connection with said universal bar, means for regulating the extent of such lost motion, and means for regulating the normal position of said feed-dogs.

16. In a type-writing machine, the combination with a carriage and printing-keys, of a universal bar for said keys, a line-lock adapted to lock said universal bar substantially in its normal position, and means coöperating with said universal bar and adjustable to regulate the touch on the keys without interfering with the operation of said line-lock device.

Signed at Syracuse, in the county of Onondaga and State of New York, this 1st day of June, A. D. 1904.

ALEXANDER T. BROWN.

Witnesses:
H. A. CARHART,
C. E. TOMLINSON.