

A. T. BROWN.
TYPE WRITING MACHINE.
APPLICATION FILED JUNE 4, 1904.

Patented Oct. 19, 1909.
2 SHEETS—SHEET 1.

937,412.

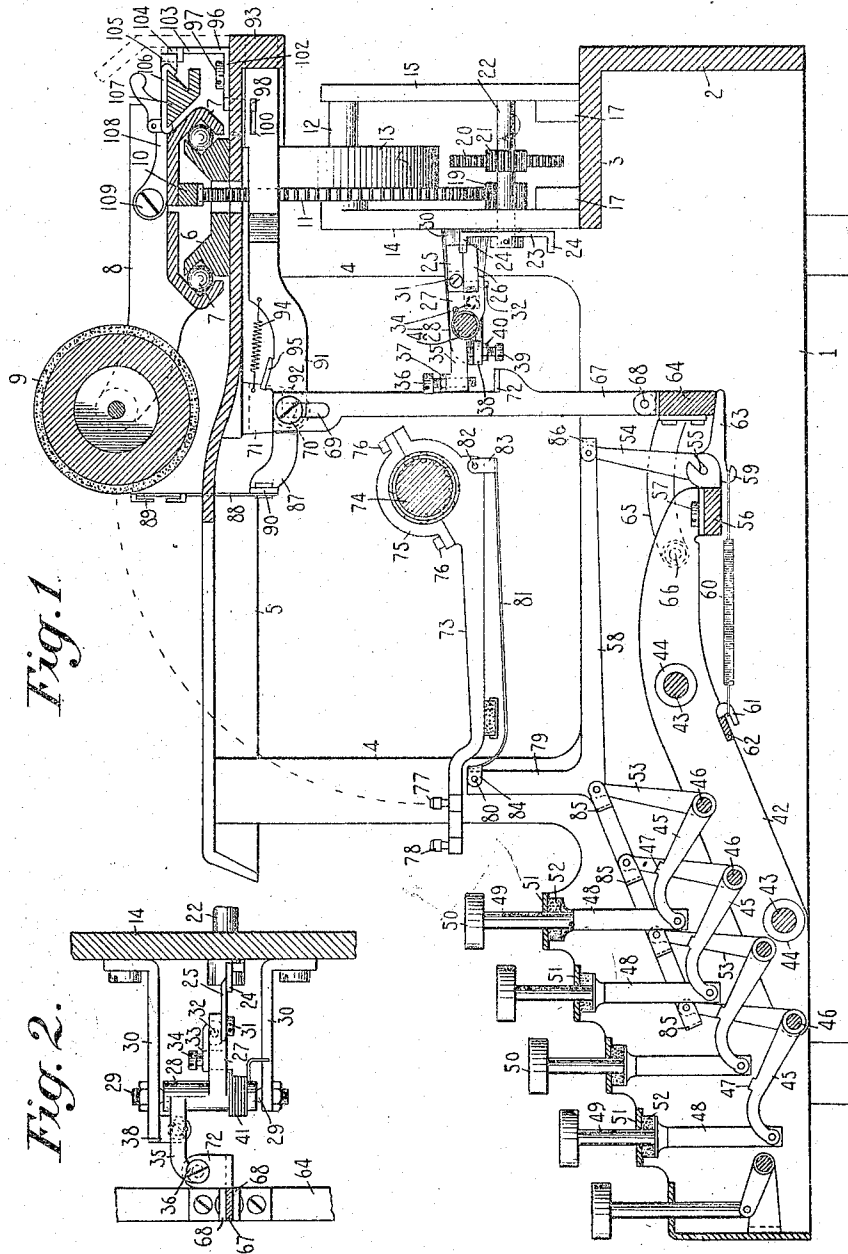


Fig. 1.

Fig. 2.

Witnesses
E. M. Wells.
M. F. Hammerstein.

Inventor
Alexander T. Brown
By his Attorney Jacob Felber

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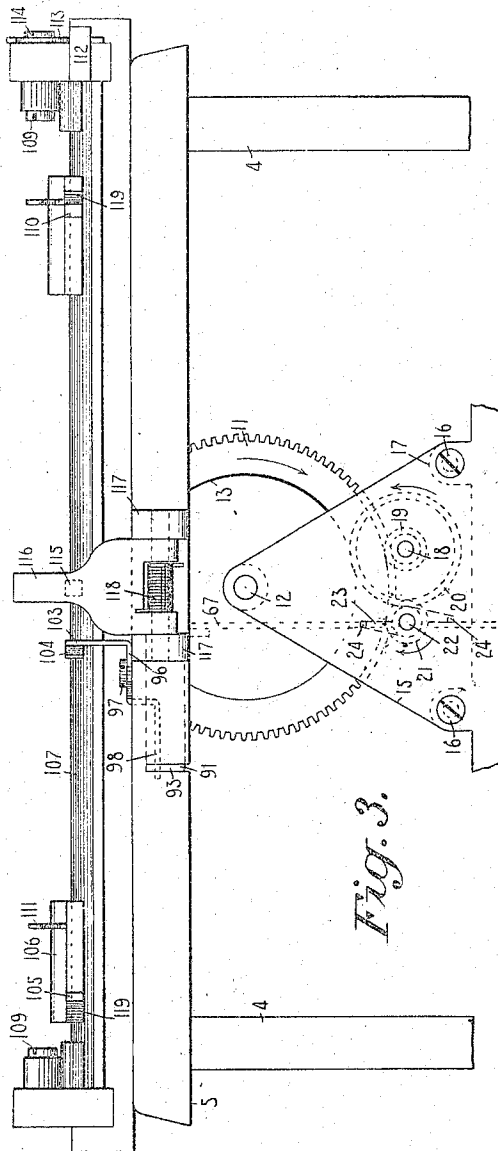


Fig. 3.

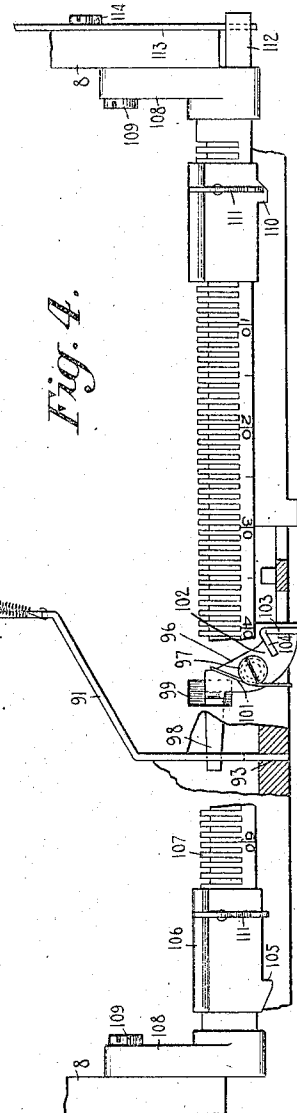


Fig. 4.

Witnesses
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UNITED STATES PATENT OFFICE.

ALEXANDER T. BROWN, OF SYRACUSE, NEW YORK.

TYPE-WRITING MACHINE.

937,412.

Specification of Letters Patent.

Patented Oct. 19, 1909

Application filed June 4, 1904. Serial No. 211,128.

To all whom it may concern:

Be it known that I, ALEXANDER T. BROWN, a 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 to typewriting machines and it consists of certain combinations and features of construction which will be fully set forth herein and particularly pointed out in the claims.

My invention is illustrated in the accompanying drawings in which—

Figure 1 is a central vertical section. Fig. 2 is an enlarged plan view showing the escapement rocker and escapement wheel and parts associated therewith. Fig. 3 is a rear elevation with some parts broken away and some omitted. Fig. 4 is a plan view of the line locking mechanism and the rack bar that supports the margin stops.

The main frame of my typewriter comprises a base portion having side plates 1, a back plate 2, a shelf 3, posts 4 rising from said base portion and a top plate 5 supported by said posts. A rail 6, mounted upon the top plate 5, has in its front and rear edges race ways for anti-friction balls or rollers 7 by which said rail supports the carriage 8, upon which is mounted a roller platen 9. A rack bar 10 is fixed to the underside of the carriage 8 and meshes with a gear wheel 11 which is mounted on a shaft 12 beneath the top plate and extends upward through a slot in said top plate and in the rail 6. The gear wheel 11 has fixed to one side thereof a spring drum 13 which drives the carriage. The shaft 12 is mounted in two plates 14 and 15 which are fixed to the shelf 3 by screws 16 threaded into lugs 17 rising from said shelf. A shaft 18 (Fig. 3) journaled in the plates 14 and 15, has fixed thereon a pinion 19 which meshes with the gear wheel 11 and also a gear 20 which meshes with a pinion 21 on a shaft 22 which is also journaled in the plates 14 and 15. The shaft 22 extends through the plate 14 and has fixed on its forward end an escapement wheel 23. Any suitable ratchet device may be interposed in this train of gearing to afford a return motion to the carriage. In the present instance, the escapement wheel is shown with two teeth 24, which project from the front face of the escape-

ment wheel in a direction substantially parallel to the axis of the shaft 22, and these teeth coöperate with a fixed dog 25 and a loose dog 26 mounted on an arm 27 projecting from the rock shaft 28, which is journaled on pivot screws 29 threaded through brackets 30 fixed to and projecting from the front face of the plate 14. The rock shaft 28 stands in front of the front face of the escapement wheel 23 and the feed dogs move to and fro in a direction which is substantially toward and from the axis of the shaft 22.

The fixed dog 25 consists of a plate of metal secured to the arm 27 by a screw 31 and the loose dog is pivoted to said arm 27 at 32 and has a backwardly extending tail 33 the motion of which is limited in one direction by the arm 27 and in the other by the head of a screw 34 which is threaded into the arm 27 and passes through a slot in the tail 33 of the loose dog. When the shaft 28 is rocked so that the loose dog passes between the teeth 24 and the hub of the escapement wheel, said loose dog is moved until the tail 33 thereof is arrested by the screw 34 by any suitable spring, such, for example, as a coiled spring seated beneath the tail 33 in a recess in the arm 27.

An arm 35 extending from the rock shaft 28 toward the front of the machine, has a screw 36 threaded through its forward end and secured in adjusted position by a lock nut 37. One of the brackets 30 is formed with an ear 38 lying beneath the arm 35 and having threaded therethrough a screw 39 which may be adjusted up and down and locked in adjusted position by a lock nut 40. The upper end of the screw 39 serves as an adjustable stop to arrest the return motion of the arm 35, and said arm is normally pressed into engagement with said screw by a spring 41 coiled about the rock shaft 28 and pressing at one end against the arm 27 and at the other against one of the brackets 30.

The keyboard mechanism is mounted in a secondary frame which is detachably mounted in the main frame of the machine. Said detachable secondary frame comprises a series of plates 42 which are strung on rods 43 and spaced apart on said rods by washers or sleeves 44. Each of the rods 43 is threaded near one or both of its ends and nuts on said threaded ends hold the plates 42 and washers 44 in position, the whole thus con-

stituting a rigid framework. Furcated key levers 45 are mounted on sleeves which are strung on rods 46 extending through the series of plates 42. These key levers are arranged in straight rows from front to back of the machine, and a plate 42 extends between each contiguous pair of rows of key levers. These key levers 45 are formed of sheet metal bent into a U-shaped form at 47, thus forming furcated levers, the front ends of which are comparatively close together and embrace bars 48 into which project the stems 49 of the keys 50. At their rear ends the furcated levers 45 are spread farther apart so that when a key is depressed the front end of its lever 45 may descend between the arms of the furcated key lever next in front of it. The stems 49 are guided in openings in frame plates 51 beneath which washers 52 of felt or other sound deadening material are secured to the rods 48. Each of the levers 45 is rigidly secured to a sleeve which is loosely mounted on a rod 46 and each of these sleeves has fixed thereto a lever arm 53 to the upper end of which is pivoted a parallel moving link which transmits the motion of the key to the type bar.

The keyboard system so far described is substantially identical with that shown and described in my prior application, Serial No. 127,536, filed October 16, 1902, typewriting machines, to which application reference is made for a fuller disclosure of this construction.

A series of secondary levers 54 are pivoted at 55 on a bar 56 which extends transversely of the machine. Two or more of the plates 42 are extended toward the back of the machine and support the bar 56 which is secured thereto by screws 57, as shown in Fig. 1. The lever arms 54 are connected to the lever arms 53 by links 58, each of which is pivoted at its front end to one of the lever arms 53 and at its rear end to one of the lever arms 54. I prefer to make the arms 53 and 54 of the same length and to so design the parts that these two arms are parallel. This being the case, each of the links 58 has a parallel motion, that is to say, when a key is depressed every point of the link 58 connected thereto moves parallel to every other point. Each of the levers 54 extends downward from its pivot, beneath which it is formed with a hook 59 to which is connected one end of a spring 60, the other end of which is connected to one of a series of hooks 61 formed by bending back the teeth of a comb plate 62, which is secured to the plates 42 and extends across the keyboard mechanism. The springs 60 hold the keys in their normal positions. Each of the levers 54 has an arm 63 extending toward the back of the machine and lying beneath a universal bar 64 which has rigidly secured to its ends arms 65 which are pivoted at 66 to the side plates 1 of the main

frame. The construction is such that when any key 50 is depressed, its furcated lever 45 and lever arm 53 are rocked, thus rocking the corresponding lever arm 54 and raising the universal bar 64 by the lever arm 63.

An upwardly extending reciprocatory bar 67 is pivoted in ears 68 rising from the universal bar 64 and is guided near its upper end by a shouldered screw 70, which passes through an elongated slot 69 formed in the bar 67. The shouldered screw 70 is threaded into a bracket 71, depending from the top plate 5. The bar 67 has projecting therefrom a lug or bracket 72 which, when the universal bar is operated, strikes the adjustable screw 36 and rocks the rocker frame on which the feed dogs are mounted. The precise point in the depression of a key at which the bracket 72 engages the screw 36 and the precise extent of motion imparted to the rocker frame by the operation of the key, may be regulated by adjusting the screws 36 and 39. I contemplate some such adjustment of these parts as is shown in Fig. 1, where it will be seen that there is a considerable amount of lost motion between the bracket 72 and the screw 36 and that the screw 39 is so adjusted that a slight motion of the rocker frame will permit the loose dog 26 to escape from the tooth 24 of the escapement wheel. The parts being thus adjusted, but little work is involved in rocking the rocker frame and this work does not begin until the other key operated parts have acquired considerable momentum.

The type bars 73 are mounted upon a rod 74 by a ball bearing connection. The rod 74 is bent into the segment of a circle and has grooves or ball races cut in its surface. The type bar, at the point where it surrounds the rod, is made of two pieces, a semi-circular strap 75 being secured to the bar by screws 76, thus forming a circular opening or eye which is grooved internally to form a ball race cooperating with that formed in the rod 74. Two types 77 and 78 are mounted on each type bar, and the segment 74 is shiftable up and down to bring one or another of said types to the printing point. The precise construction of type bar segments and ball bearings here shown is immaterial to the present invention, but are described and claimed in other applications of mine copending herewith.

Each of the parallel moving links 58 has an upwardly extending arm 79 which is pivoted at 80 to a link 81 which is pivoted at 82 to a type bar 73. The link 81 consists of a strip of resilient sheet metal which is bent in the manner shown in Fig. 1 and has ears 83 bent back from its edges and embracing a portion of the type bar 73 to which said ears are pivoted at 82. At its forward end the link 81 is formed with a pair of ears 84 which are bent back as shown and pivoted

to the arm 79 at 80. The form of the link 81 is such that said link constitutes in effect a spring connection between the arms 79 and the type bar. I have found that this form of connection greatly improves the touch on the key. For example, when the type strikes the platen, the key is not violently or suddenly arrested but is arrested only through this resilient link which lessens the shock on the finger of the operator.

The type bars 73 are arranged segmentally, those type bars which are near the end of the segment lying at a greater distance above the links 58 than those near the center of the segment and also lying in different planes at different inclinations to the vertical. The arms 79 which are connected to those type bars near the ends of the segment are accordingly made longer and at their upper ends are bent into the plane of their respective type bars. By an inspection of Fig. 1 it will be seen that the forwardly extending portion of the links 58 are all alike except as to length. In practice, therefore, when these links are made, they are all blanked out alike, each one having its arm 79 of sufficient length to reach the highest type bar of the segment and each having its forwardly extending arm of sufficient length to reach the key lever of the front row. Each of these blanks then has its forwardly extending arm cut off to the proper length and bent back upon itself as shown at 85 so that the lever arm 53 is pivoted between the forwardly extending arm of the link 58 and the backwardly bent end of that arm. At its rear end each of the levers 58 is bent back upon itself as shown at 86 and the lever arm 54 is pivoted between the link and the bent back portion thereof. Each of the arms 79 is cut off, if necessary, to a length appropriate to the height of the particular type bar to which it is to be connected. The construction of the keyboard mechanism is such that the levers 45 and 53, the bell crank levers 54, 63, the links 58 and springs 60 are all assembled outside of the machine in the detachable frame which has been described, and this part of the mechanism is inserted in the machine as an entirety.

The reciprocatory bar 67 has an arm 87 at its upper end (Figs. 1 and 4) and to this arm the stem 88 of a ribbon guide 89 is secured at 90. The ribbon guide 89 normally holds the ribbon a little below the printing point but raises it to cover the printing point when the arm 67 rises with the universal bar 64. The stem 88 of the ribbon guide passes through an opening in the top plate 5 by which opening said stem is guided in its up and down motion.

My line lock mechanism coöperates with the reciprocatory bar 67. A slide bar 91 (Figs. 1 and 4) is mounted at its forward end upon the screw 70 which extends

through an elongated slot 92 formed in said bar. At its rear end the bar 91 slides in a slot cut in the rear flange of the top plate as shown at 93. A light spring 94 connected at one end to the bar 91 and at the other to the bracket 71, tends to draw said bar toward the front of the machine. The bar 91 is formed with a flange 95 which normally stands in the position shown in Fig. 1 with its forward edge just out of the path of the bar 67; but when the bar 91 is drawn forward by the spring 94 the flange 95 passes above the upper end of the bar 67 and locks the same against operation. The flange 95 is made with its stop or locking face oblique to the path of motion of the bar 91 so that if the operator is striking the keys in rapid succession at the moment when the bar 91 is moved forward by its spring 94, said flange may happen to catch the bar 67 at about the middle of its upward motion. If so, when the bar 67 returns to its lower position, the flange 95 will follow it up in such return motion and lock the bar 67 in its extreme return position against any further actuation of a key. When the machine is being operated very rapidly it may happen that one key will be struck before another returns entirely to normal position, so that for a number of strokes in succession the universal bar may not fully return to normal position. It will be perceived that the escapement mechanism here shown is adapted to operate under these conditions. If it were not for the oblique arrangement of the stop 95 this stop would either have to be arranged in such a position that it would not arrest the bar 67 in its extreme return position, or else the stop might not snap over the top of the bar 67 at all when the machine is being operated very rapidly. By the present arrangement the bar 67 will be arrested even though one key be depressed before another has entirely returned to normal position, and every downward motion of said bar will be followed up by the stop 95 and the bar 67 will be locked in its extreme return position.

The bar 91 is normally held in its rear position shown in Fig. 1 by a lever 96 which is pivoted on a screw 97 on the top of the top plate of the machine. An arm 98 of the lever 96 is bent downward through an opening 99 in the top plate 5 and thence extends into a slot 100 in the bar 91 as shown in Fig. 1. The lever 96 is pressed in a direction to move the bar 91 toward the back of the machine by a spring 101 which is coiled about the screw 97 and which, at one end, engages the lever 97 and at the other is secured to the top plate 5. The lever 96 has an arm 102 (Fig. 4) from which rises a vertically disposed piece 103 which is formed with a cam portion 104 which lies in the path of a line stop 105, which projects from

a stop piece 106 which is adjustably mounted on a rack bar 107, which is mounted on the carriage 8. The rack bar 107 has fixed thereto at its ends, arms 108 which are pivoted at 109 to the carriage 8. The margin stop 110 is also mounted on the bar 107. The line stop 105 and the margin stop 110 may be so mounted on the bar 107 as to be adjustable endwise of said bar by any suitable means. As shown in the present case these parts are mounted on the bar dovetail fashion, and said bar is formed with a series of slots or notches which are engaged by pivoted latches 111 to hold the stops in any position along the bar to which they may be adjusted. When the line stop 105 engages the cam 104 which is mounted on the lever 96, said cam is moved toward the back of the machine and the arm 98 is thus moved toward the front of the machine, leaving the bar 91 free to move forward under the impulse of its spring 94 in the manner which has been described. It will, of course, be understood that the spring 101 is stronger than the spring 94.

If it is desired to write a few letters after the line lock has been operated, said line lock may be released by the following means:—The bar 107 is prolonged at one end by a projection 112 beneath which lies the rear end of a lever 113 which is pivoted at 114 to the carriage and which extends to the front of the carriage, where it is formed with a finger piece. By depressing this finger piece the arm 107 may be rocked about its pivots 109, thus raising the stop 105 above the cam 104. The lever 96 will then be moved toward the back of the machine by its spring 101, withdrawing the stop 95 from over the bar 67. If the stop 105 be thus permitted to pass a few letter spaces beyond the cam 104 it will encounter a stop 115 which projects forward from an arm 116 which is pivoted in ears 117 projecting from the main frame. The arm 116 is pressed toward the front of the machine by a spring 118 so that the stop 115 normally lies in the path of the line stop 105 and the margin stop 110; but it may be moved back out of the path of these stops by rocking the arm 116 about its pivot. Each of the stops 105 and 110 is formed with a cam portion 119 so that if either of said stops be moved past the stop 115 for the purpose of writing in the margin, then, when the carriage is returned, these cam portions 119 engaging the stop 115, move said stop backward out of the way and permit the carriage to pass freely.

The carriage and carriage mounting set forth in this case, are not claimed herein, but are claimed in my pending application, Serial No. 214,625, filed June 29th, 1904. The carriage feed mechanism and the type and key action herein set forth are not

claimed in this application but are respectively claimed in divisional applications Serial No. 272,197, filed August 1st, 1905, and Serial No. 229,486, filed October 21st, 1904. Said type and key action is also claimed more broadly in my pending application, Serial No. 127,536, filed October 16th, 1902.

Various changes may be made in the details of construction and arrangement without departing from my invention.

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

1. In a typewriting machine, the combination with a carriage and key-controlled printing instrumentalities, of means for locking said printing instrumentalities out of operation at the end of a line, comprising two cooperating locking members, one of said members being operable by the keys, one of said members having a motion into engagement with the other under the control of the carriage, and one of said members having its locking face oblique to the direction of such motion.

2. In a typewriting machine, the combination of a carriage, a spring, two cooperating locking members, one of which is moved by said spring under the control of the carriage into position to engage and lock the other, and one of which has its stop or locking surface oblique to the path of such motion.

3. In a typewriting machine, the combination of a series of keys; a universal bar; a locking member which moves with said universal bar, and a locking member which cooperates with the first mentioned locking member to lock said universal bar, one of said members being movable into and out of position to engage the other, and one of said members having its stop or locking face oblique to the path of such motion.

4. In a typewriting machine, the combination with the keys, a universal bar actuated thereby, and a carriage, of a spring moved slide bar adapted to lock said universal bar, and a spring pressed lever holding said slide bar out of working position and moved by the carriage to release said slide bar.

5. In a typewriting machine, the combination with the keys, a universal bar actuated thereby, and a carriage, of a slide bar provided with an oblique stop or locking member co-acting with said universal bar and tending to move to locking position, and a spring moved lever normally holding said slide bar out of working position and moved by the carriage to release said slide bar.

6. In a typewriting machine, the combination of the keys, a universal bar moved vertically thereby, a link connected to said universal bar and guided on the frame, a spring pressed laterally movable rod or bar arranged, when moved from normal position, to arrest said link and lock the type

mechanism, a spring actuated lever controlling the last named rod or bar, and a carriage actuating said lever at a determined point in the travel of the carriage.

6 7. In a typewriting machine, the combination of a carriage, a lever operated by said carriage and fulcrumed on the main frame on a vertical axis, a sliding bar held in inoperative position by said lever, a
10 spring for moving said bar endwise horizontally when said carriage operates said lever, a universal bar locked by said sliding bar, and type mechanism locked by said universal bar.

15 8. In a typewriting machine, the combination of a universal bar; a link connected with said universal bar to move therewith, a ribbon vibrator operated by said link; and a line lock cooperating with said link to
20 lock said link and universal bar.

9. In a typewriting machine, the combination of a universal bar; a reciprocatory member connected with said universal bar and carrying a ribbon guide; and a line lock
25 cooperating with said member.

10. In a typewriting machine, the combination of a carriage; an escapement mechanism for controlling the feed of said carriage; a universal bar; a member connected
30 with said universal bar to move therewith and having lost motion connection with said escapement mechanism; a ribbon vibrator operated by said member; and a line lock cooperating with said member.

35 11. In a typewriting machine, the combination of a carriage; an escapement mechanism for controlling the feed of said carriage; a universal bar; a member connected with said universal bar to move therewith
40 and having lost motion connection with said escapement mechanism; a ribbon vibrator

carried by said member; and a line lock cooperating with said member.

12. In a typewriting machine, the combination of a carriage; a universal bar; a
45 reciprocatory bar pivoted to said universal bar, said reciprocatory bar carrying a ribbon guide; and escapement mechanism operated by and having lost motion connection with said reciprocatory bar.

13. In a typewriting machine, the combination of a universal bar; a reciprocatory bar pivoted to said universal bar and carrying a ribbon guide; and an escapement
50 mechanism comprising a rocker frame having a part in a position to be struck by said reciprocatory bar when the same is operated.

14. In a typewriting machine, the combination of a carriage, a series of key-actuated devices, a universal bar for said key-actuated
55 devices, a ribbon vibrating device connected with said universal bar, and a line lock device cooperating with said ribbon vibrating device.

15. In a typewriting machine, the combination of a carriage, key actuated devices, a universal bar for said key actuated
60 devices, and a line lock device for locking said universal bar, said line lock device comprising means for first arresting said universal bar when the latter is out of its normal position, and then following up said
70 universal bar as it returns to normal position and locking it in normal position.

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

ALEXANDER T. BROWN.

Witnesses:

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