

T. L. KNAPP.
 TYPE WRITING MACHINE.
 APPLICATION FILED DEC. 27, 1907.

904,208.

Patented Nov. 17, 1908.

2 SHEETS—SHEET 1.

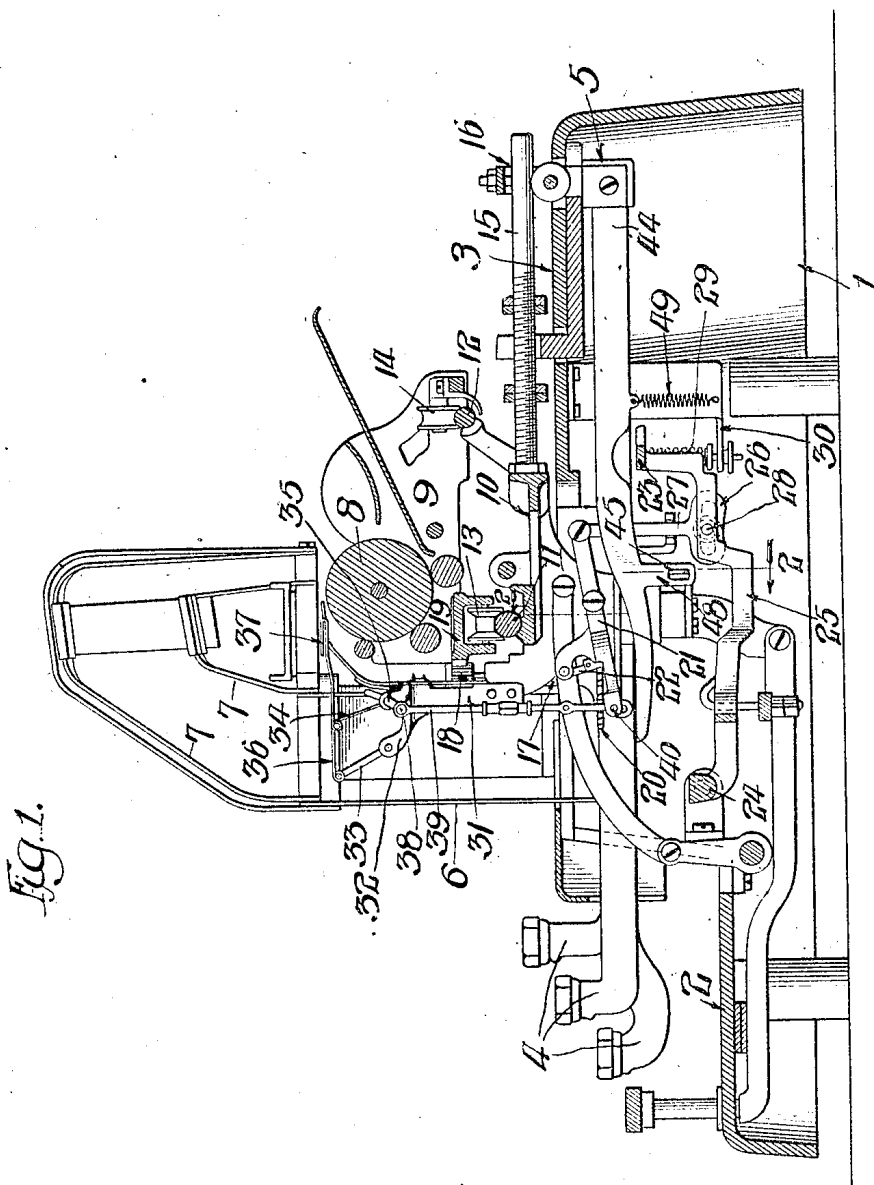


FIG. 1.

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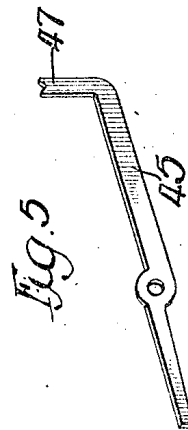
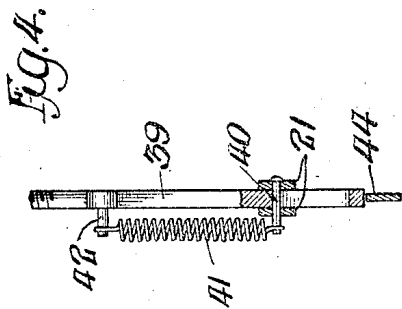
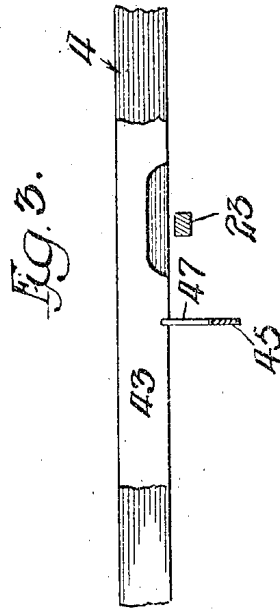
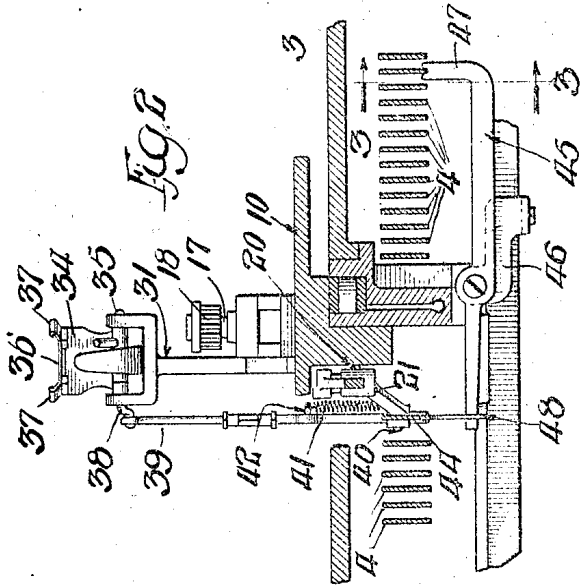
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

THERON L. KNAPP, OF WOODSTOCK, ILLINOIS, ASSIGNOR TO THE OLIVER TYPEWRITER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

TYPE-WRITING MACHINE.

No. 904,208.

Specification of Letters Patent.

Patented Nov. 17, 1908.

Application filed December 27, 1907. Serial No. 408,257.

To all whom it may concern:

Be it known that I, THERON L. KNAPP, a citizen of the United States, and a resident of Woodstock, in the county of McHenry and State of Illinois, have invented certain new and useful Improvements in Type-Writing Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in typewriting machines and more especially to an improved means in such a machine wherein certain characters may be printed without any feed movement or shifting of the paper-carriage under the action of the letter-spacing mechanism, as is necessary, for instance, in printing special characters, such as accents over or in connection with the regular letters or characters. Types for printing special characters are operated by one or more key-levers which effect movement of said types without actuation of the letter-spacing mechanism of the machine, and which are for this reason usually termed "dead-keys".

The invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims.

In the accompanying drawings which show the invention as embodied in a typewriter of the "Oliver" type, Figure 1 is a view in central, vertical, longitudinal section of a typewriting machine embodying my invention. Fig. 2 is a transverse, vertical, detail section, taken on line 2—2 of Fig. 1. Fig. 3 is a fragmentary section, taken on the line 3—3 of Fig. 2. Fig. 4 is a view showing, partially in longitudinal section, a connecting rod through which is operated the ribbon-throw mechanism. Fig. 5 is a perspective view of a lever which connects the auxiliary key-lever with parts which operate the ribbon-throw mechanism.

In said drawings, only such parts of the typewriting machine are illustrated as are essential to an understanding of the application of the several features of the invention thereto.

The general construction of the machine is like that shown in the prior United States Letters Patent to Thomas Oliver, number

599,863, granted March 1st, 1898; and its details, other than those relating to the present invention, are similar to those illustrated in the prior United States Letters Patent to Cross and Griffiths, number 834,565, granted October 30th, 1906.

As shown in said drawings, 1 designates the base-plate of the machine having a lower, forward, horizontal part 2 and a rear, elevated, horizontal part 3.

4, 4 designate a plurality of key-levers which are arranged below the rear elevated part 3 of the base-plate and are pivoted at their rear ends to a slotted fulcrum block 5 depending from said part 3. The said key-levers are connected by upright links 6 with U-shaped type-bars, 7, 7, such as are employed in said "Oliver" typewriting machine.

8 indicates the platen which is mounted in a paper-carriage 9. Said paper-carriage rests and has endwise movement on a shift-frame 10 having backward and forward shifting movement on the base-plate in order to bring the printing point of the paper beneath one or the other of a plurality of printing types carried by the type-bars. Said shift-frame is provided with transverse guide-rods 11 and 12 on which travel the supporting wheels or rollers 13 and 14 of the carriage, and with a rearwardly extending guide-rod or stem 15 which passes through a guide-standard 16 on the rear of the part 3 of the base-plate.

17 designates an upright escape-wheel shaft located near the center of the machine and mounted at the front of the shift-frame 10. Said shaft 17 is provided at its upper end with a gear pinion 18 adapted to engage rack-teeth formed on the forward, longitudinal frame-bar 19 of the paper-carriage. Said shaft 17 has affixed to its lower end an escape-wheel 20 which operates in connection with an oscillatory escapement lever 21 which extends from the front to the rear of the machine and is pivoted to the shift-frame so as to swing in a vertical plane. The forward end of the lever 21 carries a pawl 22 which is adapted for engagement with the escape-wheel, which latter is turned under the impulse imparted thereto by the carriage-actuating spring, in the manner set forth in said prior patent to Oliver.

23 indicates a transversely arranged, ver-

tically movable space-bar located beneath and adapted for actuation by the key-levers. Said space-bar constitutes part of an oscillating frame which is formed by means of said space-bar, a rock-shaft 24 arranged parallel therewith at the front part of the machine and a plurality of arms which rigidly connect the said rock-shaft with the space-bar. One of said arms 25 is located near the center of the machine, as shown in Fig. 1 of the drawings. The escapement-lever 21 is connected with the oscillating space-bar frame by means of a slotted yoke 26 attached to the lower end of an upright bar 27 which is pivoted at its upper end to the rear end of said lever. The slot in said yoke is arranged horizontally and adapted to receive a stud 28 which is fixed to the arm 25 of the space-bar frame. Through the medium of the slotted yoke, vertical movement of the space bar is transmitted to the lever and backward and forward movement of said lever with the shift-frame is permitted by said slotted yoke without affecting the action of the escapement devices.

The space-bar 23 is thrown upward by means of an expansively acting, spiral, lifting spring 29 which is arranged vertically beneath said space-bar and bears against the same at its upper end. The said upper end of the spring 29 is held in place by engagement with a depending stud on the space-bar. The lower end of said spring rests on a bracket 30 which depends from the rear, horizontal part 3 of the base-plate.

The machine illustrated is provided with a ribbon-throw device for moving or shifting the inking ribbon to carry it over the striking point of the types and to retract it therefrom, corresponding generally with that shown in said Oliver patent No. 599,863, and which comprises parts as follows: A rigid supporting arm 31 is attached to the shift-frame and extends upwardly to a point in front of the platen. The upper part of said supporting arm is provided with a forwardly extending horizontal arm 32. Two parallel, oscillating links 33 and 34 are pivoted at their lower ends, one to the arm 32 and the other to the top of the standard 31. The rearmost link 34 is pivoted to the supporting arm by means of a rock-shaft 35, to which said link 34 is rigidly attached. To the upper ends of said links is pivoted a horizontally arranged guide-plate 36 which extends towards the platen and is provided at its rear end with two ribbon-guides or guide-loops 37, 37 located at opposite sides of the printing point. The pivoted links described afford movement of the guide-plate horizontally toward and from the printing point. For actuating the guide-plate, the rock-shaft is provided with a rigid crank-arm 38 to which is pivotally connected the upper end of a connecting rod 39 which

extends downwardly to and has pivotal engagement with the forward end of the escapement lever 21. These parts are so arranged that when any one of the key-levers 4, 4 is depressed, the escape-lever will be moved in a direction to depress its forward end with the connecting rod 39, and the upper ends of the links and the guide-plate thereon will be thereby advanced toward the platen. The inking ribbon will be thus carried over the printing point, and, when the key is released and the type-bar rises permitting the rising of the space-bar, the said guide-plate and ribbon will be drawn backwardly away from the platen.

Referring now to the features of construction constituting my present invention: The connecting means between the lower end of the connecting rod 39 and the end of the escapement-lever 21 comprises a vertical slot in the lower end of said connecting rod, which is engaged by a pivot pin 40 inserted through the end of said escapement-lever; the purpose of the slot-and-pin connection being to permit the connecting rod to be raised, by means hereinafter to be described, to actuate the ribbon-throw mechanism without imparting movement to said escapement-lever. A contractile, coiled spring 41, (Fig. 4) attached at its upper end to a stud 42, projecting laterally from the connecting rod 39, and at its lower end to the projecting end of the pivot pin 40, acts to draw the connecting rod downward and to normally retain the pin 40 in the upper end of the slot in the connecting rod.

43 designates an auxiliary key-lever which extends from front to rear of the machine and is pivoted at its rear end to the fulcrum block 5. Said key-lever 43 is connected with a type-bar which carries the special type to be operated by the said key-lever, but which type-bar is like the others of the series of type-bars 7, 7. Said key-lever 43, so far as its function of actuating its connected type-bar is concerned, is made like, and operates in the same manner as, the other key-levers. Said key-lever 43, however, at a point above the space-bar 23 is cut away or notched on its lower edge, so as to permit depression of said key-lever without contact with or operation of the said space-bar. Inasmuch as the said auxiliary key-lever 43 does not give any movement to the spacebar, and it is necessary that movement be given to the ribbon-throw device, in the depression of said auxiliary key-lever, in order that the ribbon may be moved over the printing point when the type operated by said auxiliary key-lever is brought against the paper, a construction is provided as follows: 44 indicates a horizontal operating lever which extends from front to rear of the machine and pivoted at its rear end to the fulcrum block 5. Said lever is pivoted in a manner allowing its forward

end to swing in a vertical plane and is arranged with its said forward end beneath and in position for contact, in its upward movement, with the lower end of the connecting rod 39, in such manner that upward movement of the said forward end of the lever will lift the said connecting rod and actuate the ribbon-throw mechanism to move the ribbon over the platen. When the rear end of the escapement lever rises in its upstroke, its motion is positively transmitted to the connecting rod and guide-plate through the pin 40, acting on the upper end of the slot in the connecting rod, and in the descent of the said rear end of the escapement lever, its motion is transmitted to said connecting rod and the guide-plate through the medium of said spring 41. Said slot and pin, together with the spring, therefore, constitute a connection between the escapement lever and connecting rod, adapted normally to transmit motion from the escapement lever to the ribbon-throw device positively in one direction and yieldingly in the opposite direction for advancing and retracting the ribbon, and which is adapted to yield in one direction in a manner to permit the connecting rod to be moved or lifted relative to, or without any movement of, the escapement lever, when the connecting rod is moved by actuating means separate from the said escapement lever; that is to say, by the action of the operating lever 44 arranged and operating as above set forth. At a point in its length above the space-bar, said lever 44 is notched in its lower edge (Fig. 1) to allow rising and falling movement of said lever without its coming into contact with said space-bar. 45 indicates a transversely arranged, horizontal connecting lever which is pivoted between its ends to a bracket-member 46 depending from the horizontal plate 3 of the machine. Said lever 45 extends from a point beneath the auxiliary key-lever 43 to the lever 44 and its end beneath said key-lever 43 is provided with an upwardly extending arm 47 adapted for contact with said key-lever. Said arm 47 has in its upper end an upwardly opening notch adapted to receive the lower edge of said key-lever 43. A contractile, coiled spring 49, connected at its upper end with the operating lever 44, and at its lower end with the bracket 30, holds the forward end of the said lever 44 at the downward limit of its movement so that the connecting rod 39 will be normally free to rise and fall, without restriction by reason of the presence of the end of the lever 44 beneath it. These parts are so arranged that depression of said key-lever 43 will depress the adjacent end of the connecting lever 45. At its opposite ends said transverse connecting lever engages the longitudinal operating lever 44 in such manner that the upward movement of said op-

posite end will impart upward movement to the lever 44 to effect the actuation of the ribbon-throw mechanism. A connection between the two levers 44 and 45 is provided consisting of a depending, integral arm 48 on the lever 44, which depending arm is provided with a slot or opening through which projects the end of the lever 45, which latter lever in its upward movement acts on the upper edge of the said slot and effects thereby the lifting of the same to actuate the ribbon-throw mechanism, as above described.

With this construction it will be seen that when the auxiliary key-lever 43 is depressed, it acts, through the levers 44 and 45, to actuate the type-bar connected therewith and the ribbon-throw mechanism, without actuating the spacing mechanism. The said type-bar will carry a type-head adapted to print accents and like characters that are to be omitted in some instances and printed in other instances, such as the acute, grave and circumflex accents—so that such characters may be printed immediately over letters; it being obvious that no spacing movement of the carriage should take place between the printing of the letter and of the character, when the latter is to be placed immediately over the latter, or is otherwise associated therewith.

I claim as my invention:—

1. In a typewriting machine, the combination with type-bars, key-levers, letter-spacing mechanism embracing an oscillating escapement-lever which is operated by said key-levers and a ribbon-throw device, of a connecting rod for operating the said ribbon-throw device from the said escapement-lever, having connection with the latter by means transmitting motion to the connecting rod positively in one direction and yieldingly in the opposite direction, an auxiliary key-lever connected with one of the type-bars and which has no action upon the letter-spacing mechanism, and means operated by said auxiliary key-lever and acting on said connecting rod to give movement to the ribbon-throw device.

2. In a typewriting machine, the combination with type-bars, key-levers, a vertically movable space-bar extending beneath the key-levers, letter-spacing mechanism operated by the movement of said space-bar and embracing an escapement lever which oscillates in a vertical plane, and a ribbon-throw device, of an upright connecting rod for transmitting movement to said ribbon-throw device from the escapement lever, said connecting rod having connection with said escapement lever by means transmitting motion to the connecting rod positively in one direction and yieldingly in the opposite direction, an auxiliary key-lever provided with a notch in its lower edge above the said space-bar, and means operated by the said

auxiliary key-lever adapted to act upon the said connecting rod for giving movement to the ribbon-throw device.

3. In a typewriting machine, the combination with type-bars, key-levers, letter-spacing mechanism operated by the key-levers and embracing an oscillating escapement lever, and a ribbon-throw device, of an upright connecting rod for operating the ribbon-throw device, having slot-and-pin connection with said escapement lever, a spring connecting said escapement lever with said connecting rod, an auxiliary key-lever connected with one of said type-bars and which has no action upon the letter-spacing mechanism and means operated by said auxiliary key-lever and acting on said connecting rod to give movement to the ribbon-throw device.

4. In a typewriting machine, the combination with type-bars, key-levers, letter-spacing mechanism operated by the key-levers and embracing an oscillating escapement-lever, and a ribbon-throw device, of an upright connecting rod for operating the ribbon-throw device, having slot-and-pin connection with said escapement-lever, a spring connecting said escapement-lever with said connecting rod, an auxiliary key-lever connected with one of said type-bars and which has no action upon the letter-spacing mechanism and means operated by said auxiliary key-lever and acting on said connecting rod to give movement to the ribbon-throw device, embracing a vertically swinging operating lever located beneath and adapted to act upwardly upon the lower end of said connecting rod.

5. In a typewriting machine, the combination with type-bars, key-levers, letter-spacing mechanism operated by the key-levers and embracing an oscillating escapement-lever, and a ribbon-throw device, of an upright connecting rod for operating the ribbon-throw device, having slot-and-pin connection with said escapement lever, a

spring connecting said escapement lever with said connecting rod, an auxiliary key-lever connected with one of said type-bars and which has no action upon the letter-spacing mechanism, a longitudinally arranged, vertically swinging operating lever located beneath and adapted to act upon the lower end of said connecting rod, and a transverse connecting lever, pivoted between its ends and having one of its ends engaged with said auxiliary key-lever and its other end engaged with the said operating lever.

6. In a typewriting machine, the combination with the type-bars, key-levers, a space-bar located beneath and acted upon by the key-levers, letter-spacing mechanism operated by the movement of said space-bar and embracing an escapement-lever which oscillates in a vertical plane, and a ribbon-throw device, of an upright connecting rod for transmitting movement from said escapement lever to the ribbon-throw device, said connecting rod having slot-and-pin connection with said escapement-lever, a spring applied between the said escapement-lever and the connecting rod, an auxiliary key-lever provided with a notch in its lower edge above the said space-bar, a longitudinally arranged, vertically swinging operating lever, the moving end of which is located in the same vertical plane with and is adapted to act upwardly upon the lower end of said connecting rod, and a transverse connecting lever, pivoted between its ends and which is engaged at one end with the said key-lever and at its opposite end with the said operating lever.

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 18th day of December, A. D. 1907.

Theron L. Knapp.

Witnesses:

L. L. Schroeder,
E. R. Hoy.