T. L. KNAPP.

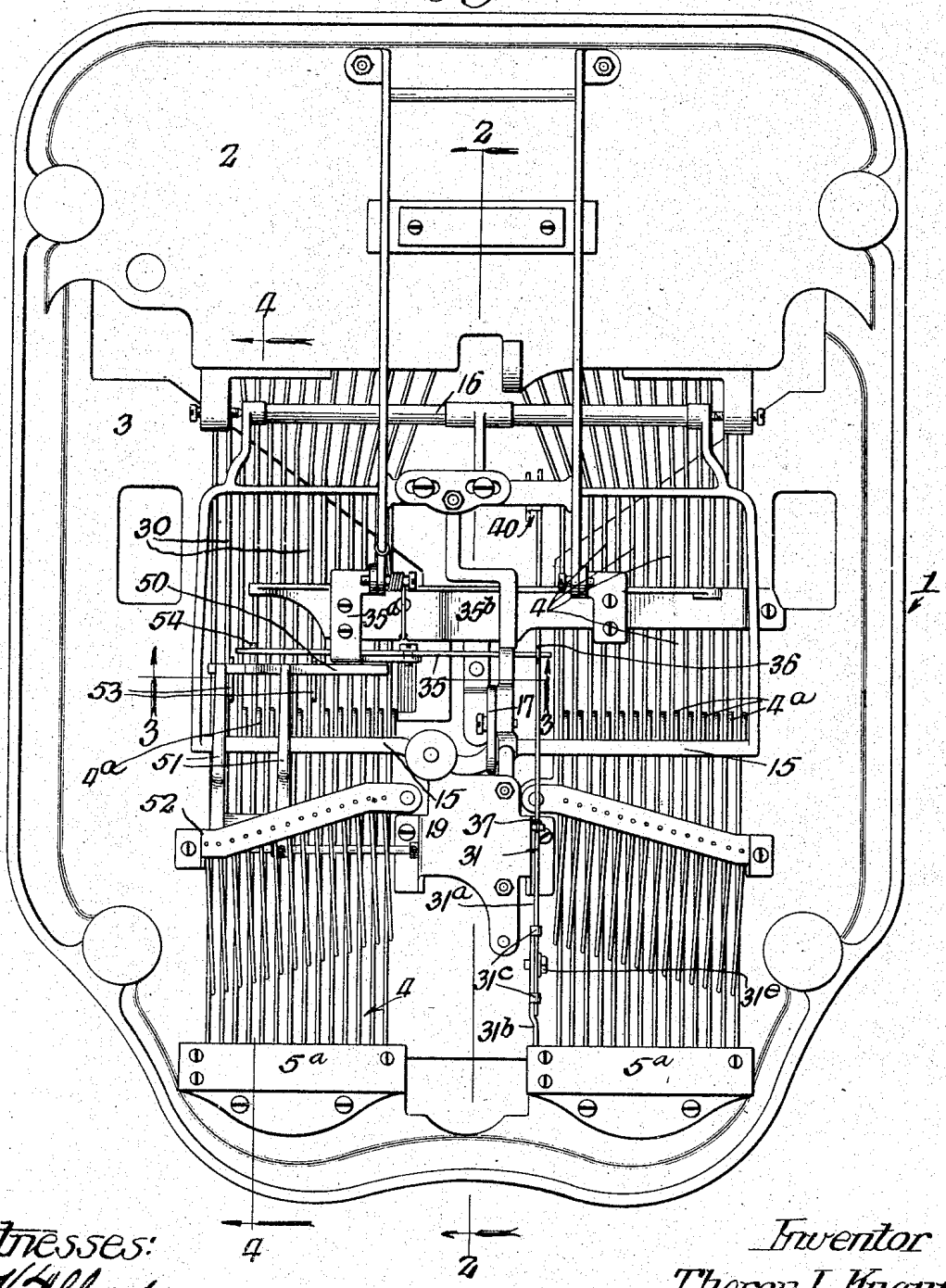
DEAD KEY MECHANISM FOR TYPE WRITING MACHINES.

APPLICATION FILED AUG. 2, 1910.

1,063,977. **Patented June 10, 1913.**

3 SHEETS—SHEET 1.

Fig. 1



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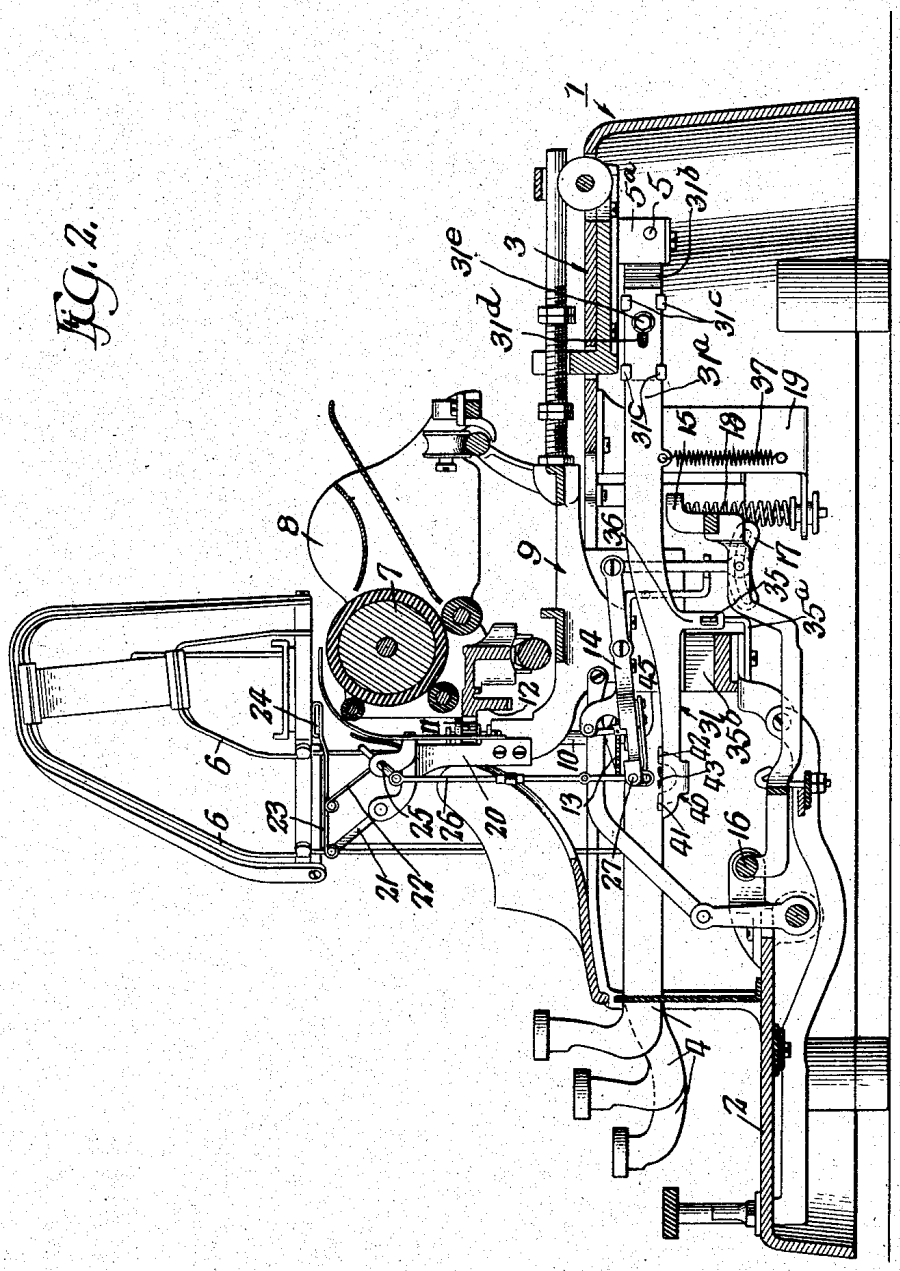
3 SHEETS—SHEET 2.

Fig. 2.



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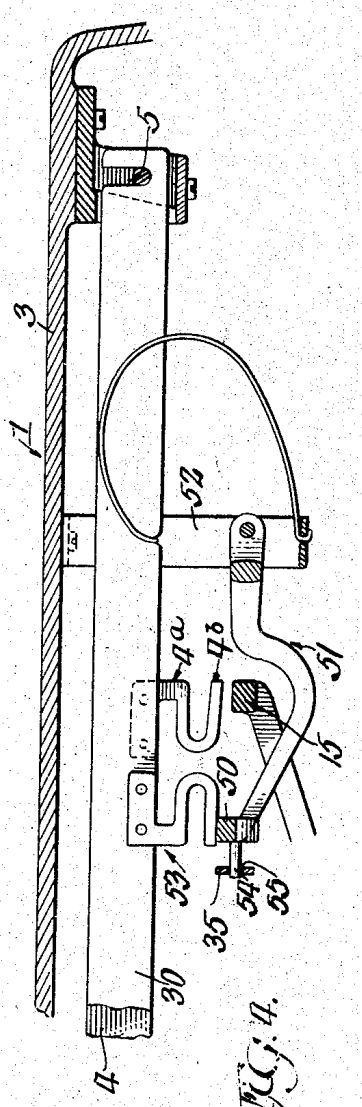

FIG. 4.

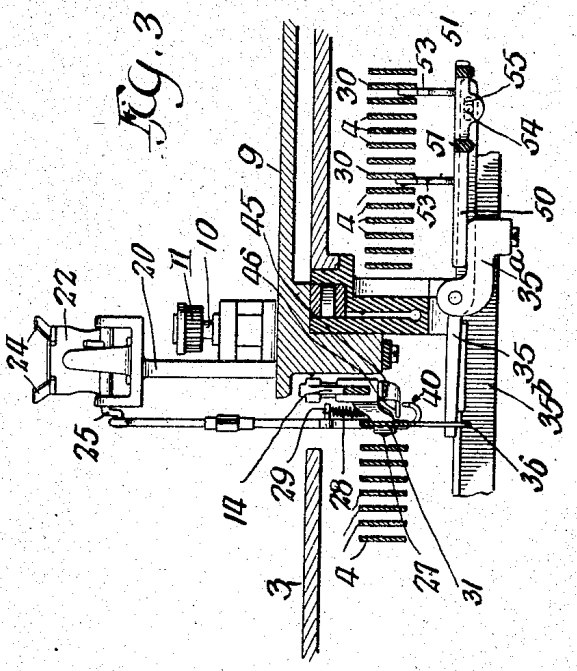

FIG. 3

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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.

DEAD-KEY MECHANISM FOR TYPE-WRITING MACHINES.

1,063,977. Specification of Letters Patent. Patented June 10, 1913.

Application filed August 2, 1910. Serial No. 575,054.

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 Dead-Key Mechanism for 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 provided with means whereby certain characters may be printed without any feed movement or shifting of the carriage under the action of the letter-spacing mechanism, as is necessary for instance in printing a special character, such as an accent over or in connection with the regular letters or characters. Special characters are operated by one or more key-levers which effect movement of said type without actuation of the letter-spacing mechanism of the machine and which are, for this reason, usually termed "dead-keys."

The invention relates particularly to an auxiliary universal bar adapted to be operated upon by each of several dead-key levers whereby the construction involving several dead-keys is simplified.

The invention consists of the matters hereinafter described and more particularly pointed out in the appended claims.

In the drawings only such parts of the typewriting machine are shown as are essential to an understanding of the application of the invention.

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 T. L. Knapp, Number 904,208, granted November 17th, 1908, and the details of the dead-key mechanism other than those relating to the present invention, are similar to those illustrated in Letters Patent Number 946,229, granted January 11th, 1910, to T. L. Knapp.

In the drawings:—Figure 1 is a plan view of a typewriting machine looked at from below the base. Fig. 2, is a longitudinal section through the machine taken on the line 2—2 of Fig. 1. Fig. 3 is a transverse detail section taken on the line 3—3 of Fig. 1. Fig. 4 is a detail longitudinal section taken on the line 4—4 of Fig. 1.

As shown in the said drawings,—1 is a base-plate provided with a lower forward horizontal part 2 and a rear elevated horizontal part 3.

4, 4 are key-levers pivoted to a rod 5 extending transversely of the key-levers and supported in the blocks 5^a depending from the part 3. Said key-levers are connected to the type-bars 6, 6.

7 is a platen mounted on a paper-carriage 8 which is supported upon a shift-frame 9. An upright escape-wheel shaft 10 mounted upon the shift-frame 9 is provided at its upper end with a gear-pinion 11 adapted to engage rack-teeth formed on a frame-bar 12, and with an escape-wheel 13 which is engaged by an escapement-lever 14 to permit the feed movement of the paper-carriage. The said escapement-lever is operatively connected with an oscillating frame comprising a space-bar or universal bar 15, a rock-shaft 16, and a plurality of arms rigidly connecting said rock-shaft with said space-bar. The said space-bar is actuated by the depression of the key-levers to give letter-space movement to the paper-carriage in a well known manner. As illustrated herein, each of said key-levers except the dead-key levers presently to be mentioned, is provided with an extension in the form of a "bendable lug" 4^a (see Fig. 4) secured to one face of said lever and having a part 4^b which is adapted to act directly against the universal bar 15. It is to be understood that this feature of the construction forms no part of the present invention, the same being covered in a separate application Serial Number 575,055 filed August 2, 1910, patented April 18, 1911, No. 989,851. The escapement-lever 14 is connected with the space-bar frame by means of a slotted yoke 17. An expansively acting spiral spring 18 is arranged to bear upwardly against the space-bar 15.

The ribbon-throw device is of familiar construction and comprises a vertically arranged rigid supporting arm 20, two parallel oscillating links 21 and 22 supported at the upper end of said arm 20 and a guide-plate 23 which extends toward the platen and is provided with ribbon guide loops 24.

A rock-shaft 25 supports the link 22 and is operatively connected with the escapement-lever 14 by means of a connecting rod 26 which is provided at its lower end with a slot which is engaged by a pivot pin 27 inserted through one end of the said escapement-lever.

28, (see Fig. 3) designates a contractile coiled spring attached at its upper end to a laterally projecting stud 29 and at its lower end to the extended end of the pivot-pin 27.

30, 30 indicate dead key-levers which extend from front to rear of the machine and are pivoted on the rod 5. They are each connected with a type-bar which carries the special type to be operated by said levers but which type-bar is like others of the series of type-bars, 6, 6.

A horizontal operating lever 31, parallel to the key-levers, is pivoted on the rod 5 and is arranged with its forward end beneath and in position for contact with the lower end of the connecting rod 26 in such manner that upward movement of the forward end of said lever will lift the said connecting rod and move the ribbon over the platen.

35, (see Fig. 3), is a lever extending transversely of the key-levers and below the same. It is pivotally connected intermediate its ends to a bracket 35^a rigidly secured to a cross-bar 35^b secured to the base 1. One end of said transverse lever 36 engages a slotted, depending arm 35 formed on the operating lever 31. The opposite end of said transverse lever is arranged to be actuated by either of the dead-key levers 30, 30 in a way presently to be described.

A contractile coiled spring 37, connected at its upper end to the operating lever 31 and at its lower end to a fixed bracket 19, normally holds the forward end of said operating lever at the downward limit of its movement. At the forward end of the operating lever is formed an upright member 40 which is spaced laterally from that part of the end of the lever which is adapted to engage the lower end of the connecting rod 26 to actuate the ribbon-throw device. Said member 40 is provided with upright legs 41 42, which are separated longitudinally by a space 43. A forwardly projecting plate 45 is secured to the lower face of the escapement lever 14. Said plate 45 has a laterally projecting finger 46 which extends into the plane of the upright member 40 and which is adapted to be engaged by the leg 41 or leg 42 of that member when the shift frame is in its forward or backward position, to actuate the escapement lever, but which is unaffected by the upward movement of said upright-member when the shift-frame is in its normal or midway position, by reason of its location directly above the space 43. In all cases, however, the ribbon-throw device will be operated by the forward end of the operating lever. The construction thus far is substantially that described in the aforementioned patent to Knapp No. 946,229.

I now pass to a description of the mechanism by which the operating lever 31 is actuated by either of the dead-key levers. 50, (see Figs. 3 and 4), is an auxiliary universal bar, extending transversely below the dead-key levers in position to be operated upon thereby. Said universal bar forms part of a vertically rocking frame 51 which is hinged to a fixed bracket arm 52 depending from the horizontal part 3 of the base. Each dead-key lever is provided with an extension in the form of a lug 53, substantially like the lugs 4^a of the other key-levers. Said extensions 53 are arranged forward of the extensions 4^a and the rocking frame of the main universal bar 15 and the rocking frame of the auxiliary universal bar 51 are relatively arranged so that the operation of the one will not interfere with that of the other. A pin or lug 54 is rigidly connected to the front face of the bar 51 and engages within a slot 55 in the end of the transverse lever 35.

It is apparent that the depression of either of the dead-key-levers will, through its associated lug 53, depress the auxiliary universal bar 50, which will in turn depress one end of the transverse lever 35, thereby raising the opposite end of said lever 35 to operate the ribbon-throw and to operate the letter-spacing mechanism when the shift-frame is in its forward or rearward position. As explained above, in the present instance, the letter-spacing mechanism is not actuated by the said transverse lever when the shift-frame is in its intermediate position.

In order to provide for nice adjustment of the forward end of the operating lever 31 so as to locate the space 43 accurately below the laterally extending finger 46 of the plate 45 connected to the escapement lever, in the midway position of the shift-frame, I prefer to make the lever 31 in two parts, 31^a and 31^b (see Fig. 2) which are adjustably connected together. The part 31^b is provided with hooks 31^c at its top and bottom margins which are adapted to embrace the top and bottom margins of the parts 31^a. A clamping screw 31^e passes through a slot 31^d in the part 31^a and is threaded into the part 31^b. By loosening said screw the part 31^a may be adjusted longitudinally.

While I have shown herein but two dead-key levers, it is apparent that the auxiliary universal bar 50 makes it possible to use any number of dead-keys.

While I have shown and described herein a construction illustrating one embodiment of my invention, it is to be understood that the mechanical details thereof may be modified and changed in many ways without departing from the spirit of my invention.

I claim as my invention:—

1. In a typewriting machine, in combination with the type bars, the main-key levers, the letter-spacing mechanism and the ribbon-throw device including a connecting rod, a universal bar located below and arranged transversely of said main-key levers and having operative connection with the letter-spacing mechanism and the ribbon-throw device, said main-key levers adapted upon the operation thereof to come into contact with and operate said universal bar, a plurality of dead-key levers, each connected with one of the type bars, an auxiliary universal bar located below and arranged transversely of said dead-key levers, said dead-key levers adapted upon operation thereof to come into contact with and operate said auxiliary universal bar, and a lever arranged transversely of said dead-key levers, pivoted intermediate its ends and having operative connection at one end with said connecting rod and at the other end with said auxiliary universal bar; said dead-key levers acting only on the auxiliary universal bar and said main-key levers having no action on said auxiliary universal bar.

2. In a typewriting machine, in combination with the main key-levers, the shift-frame, the letter-spacing mechanism and the ribbon-throw device, a universal bar arranged transversely of said main key-levers and having operative connection with the letter-spacing mechanism and the ribbon-throw device, said main key-levers adapted upon the operation thereof to come into contact with and operate said universal bar, a plurality of dead-key levers, an auxiliary universal bar arranged transversely of said dead-key levers, said dead-key levers adapted upon the operation thereof to come into contact with and operate said auxiliary universal bar, an operating lever having operative connection with said auxiliary universal bar and adapted to give movement to the ribbon-throw device in any position of the shift-frame and to operate the letter-spacing mechanism in certain positions only of the shift-frame.

3. In a typewriting machine, in combination with the main key-levers, the shift-frame, the letter-spacing mechanism including an escapement lever, and the ribbon-throw device including a connecting rod, a universal bar adapted to be operated upon by said main key-levers and having operative connection with said letter-spacing mechanism and said ribbon-throw device, a plurality of dead key-levers, an auxiliary universal bar adapted to be operated upon by each of said dead key levers, an operating lever having operative connection with said auxiliary universal bar and adapted to act upwardly on said connecting rod, a member upon the rising and falling end of said operating lever spaced laterally from the portion of said operating lever which engages the connecting rod, said member being provided with two lugs and with an upwardly opening recess therebetween, and a plate secured to said escapement lever, provided with a finger which, in one position of said shift-frame, is above the recess in said member but which, in the other positions of said shift-frame, is adapted to engage the lugs of said member; said operating lever comprising two parts, and means affording a rigid and adjustable connection between the parts of said operating lever, permitting longitudinal movement of one part with respect to the other part whereby the recess in said member may be adjusted to its proper position relatively to said finger.

4. In a typewriting machine, in combination with the type-bars, the main-key levers, the letter-spacing mechanism and the ribbon-throw device including a connecting rod, a universal bar adapted to be operated upon by said main-key levers and having operative connection with the letter-spacing mechanism and the ribbon-throw device, a plurality of dead-key levers, an auxiliary universal bar arranged transversely of said dead-key levers and adapted to be operated upon thereby, an operating lever parallel with said dead-key levers and adapted to act upwardly on said connecting rod, and a lever arranged transversely of said dead-key levers, pivoted intermediate its ends and having operative connection at one end with said operating lever and at the other end with said auxiliary universal bar.

In testimony, that I, claim the foregoing as my invention I affix my signature in the presence of witnesses, this 29th day of July A. D. 1910.

THERON L. KNAPP.

Witnesses:
E. R. Hoy,
Bernard E. Giertz,
W. G. Hoy.