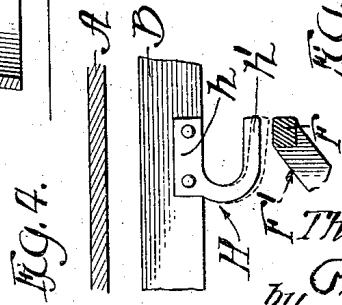
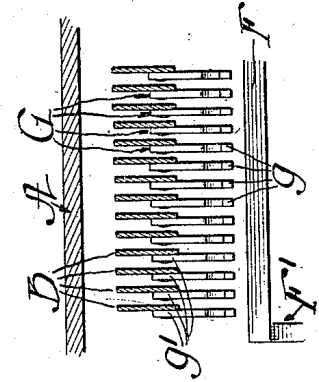
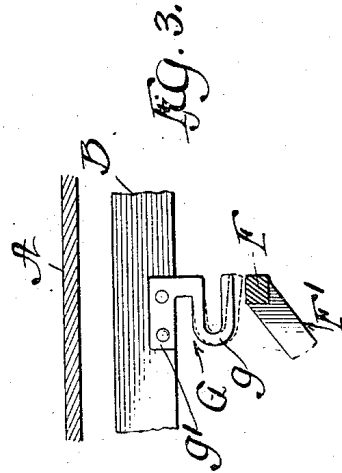
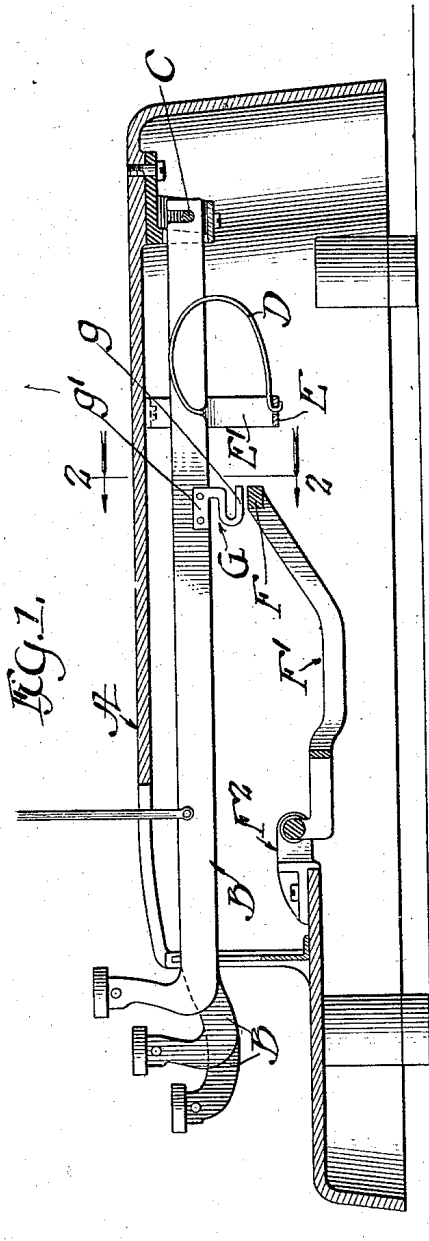


T. L. KNAPP.
 TYPE WRITING MACHINE.
 APPLICATION FILED AUG. 2, 1910.

989,851.

Patented Apr. 18, 1911.



Witnesses:
 J. H. Alfreds
 A. R. Milkina

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 Theron L. Knapp
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 Attys

UNITED STATES PATENT OFFICE.

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

TYPE-WRITING MACHINE.

989,851.

Specification of Letters Patent.

Patented Apr. 18, 1911.

Application filed August 2, 1910. Serial No. 575,055.

To all whom it may concern:

Be it known that I, HERON 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 particularly to certain novel features of construction in connection with the key-levers by means of which the several key-levers may be caused to act with uniform effect on the universal bar, which operates the letter-spacing mechanism and the ribbon feed.

The improvements are shown in the accompanying drawings as applied to a machine of the kind shown in Letters Patent No. 834,565, granted to Cross and Griffiths, October 30th, 1906, but are applicable to machines which differ in details of construction from those shown in said patent.

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

In the drawings:—Figure 1 is a longitudinal vertical section through the base frame of the machine taken between two key levers. Fig. 2 is a partial transverse section through Fig. 1 on the line 2—2 thereof. Fig. 3 is a detail partial sectional view similar to Fig. 1 shown on an enlarged scale. Fig. 4 is a similar detail sectional view showing a slightly modified form of the improved feature of construction.

As shown in the drawings,—A indicates the base frame of the machine, having a horizontal top portion and depending flanges at the sides and back margins thereof, forming a hollow structure within which the rear ends of the key-levers are inclosed.

B indicates the key-levers which extend in a direction from front to rear of the machine and are pivotally connected at their rear ends with the base frame A by means of a horizontal rod C extending transversely of said key-levers. Said key-levers, in the "Oliver" typewriter, are arranged in two laterally separated groups located one on each side of the longitudinal center line of

the machine and the key-levers illustrated in the accompanying drawings constitute a portion of the levers belonging to one of said groups. The pivot rod C constitutes the common pivot point or fulcrum for all the key-levers belonging to one of said groups. Each key-lever is provided with an upwardly opening transverse notch at its rear end adapted for engagement with said pivot rod.

D indicates one of the key-lever lifting springs which has been heretofore used on the "Oliver" typewriter. Said lifting spring is located at a point forward of the pivot rod and serves to keep the key-lever in engagement with the pivot rod. Said spring, as illustrated, consists of a wire bent into U-form and having its lower end bent downwardly and inserted into a hole in the cross-bar E and its upper end bent to form a hook which engages a notch in the lower edge of the key-lever B. The cross-bar E is supported by two downwardly projecting posts depending from the horizontal top part of the base frame A. One of these posts is indicated by E¹.

F is a universal bar extending transversely under the key-levers and adapted to be operated upon by any one of said key-levers. Said universal bar constitutes the rear member of a vertically swinging frame F¹ which is pivotally connected at its forward end to lugs F² secured to the base and which operates the escape mechanism and the ribbon mechanism in the usual manner.

G indicates lugs which are attached to the key-levers and which are adapted to act downwardly against the universal bar F when said key-levers are depressed. As indicated in Figs. 1 to 3, each of said lugs comprises a U-shaped member *g* which is offset from and preferably made integral with a straight member *g*¹. The member *g*¹ is riveted or otherwise conveniently secured to one face of the key-lever. Said lugs are stamped or otherwise formed from a piece of comparatively soft metal so that the lower leg of the U, which acts upon the universal bar, may be bent in a vertical direction as indicated in dotted lines, and serve as an adjustable extension of the key-levers by means of which the several key-levers may be caused to act with uniform effect upon the universal bar. This construction provides not only a simple and efficient means for

varying the action of each of the key-levers so as to make them all act uniformly on the universal bar, but in addition, by reason of the fact that the adjustable lugs are carried
 5 by the key-levers, no special mechanism is required for guiding the vertical movement of the key-levers as in a construction where an adjustable stop for each key-lever is carried by the universal bar, when, on account
 10 of the narrow contact surfaces of the engaging parts, due to lack of space, some means must be used for accurately guiding said key-levers in order to insure their striking the adjustable stops.

15 While the construction of what may be termed the "bendable lugs" G is preferably that shown in Figs. 1 to 3, wherein the bendable member of the lug is comparatively long, by reason of which it is the more readily bent, it is apparent that this may be
 20 modified without departing from the spirit of the invention. For example, in Fig. 4 is shown a lug H of substantially U-shape, the upper leg of which, *h*, comprises the attaching member which is directly secured to the
 25 key-lever, while the lower leg *h*¹ comprises the adjustable or bendable member of the lug, which contacts with the universal bar.

I claim as my invention:—

1. In a typewriting machine, in combination with the key-levers and a universal bar extending transversely below said key-levers, of lugs secured to each of said key-levers, said lugs each having a part adapted to act
 30 against said universal bar, said part being bendable in a vertical direction whereby the several key-levers may be caused to act with
 35 uniform effect upon the universal bar.

2. In a typewriting machine, in combination with the key-levers and a universal bar adapted to be acted upon by each of said
 40 levers, lugs rigidly secured to each of said key-levers, said lugs each including a U-shaped member having a leg adapted to engage the universal bar, said leg being bend-
 45 able in a vertical direction.

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.