(No Model.) 2 Sheets—Sheet 1.

C. ELLIOTT.

KEY ACTION FOR TYPE WRITING MACHINES.

No. 588,135. Patented Aug. 17, 1897.

Fig. 1.

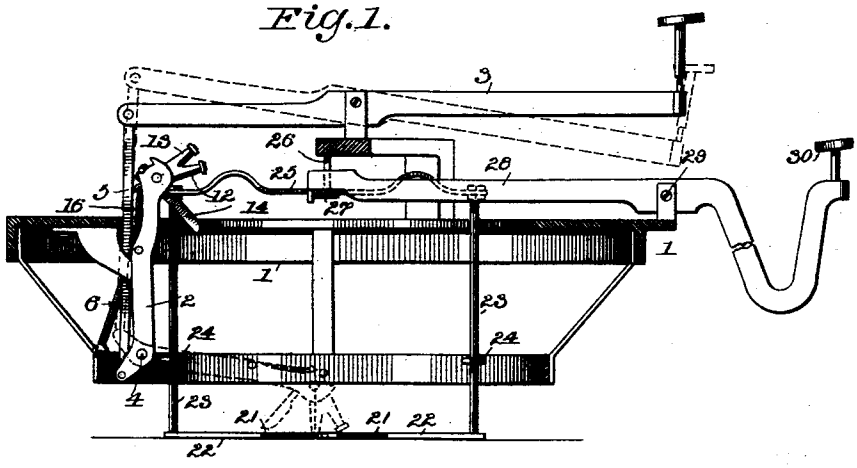


Fig. 2

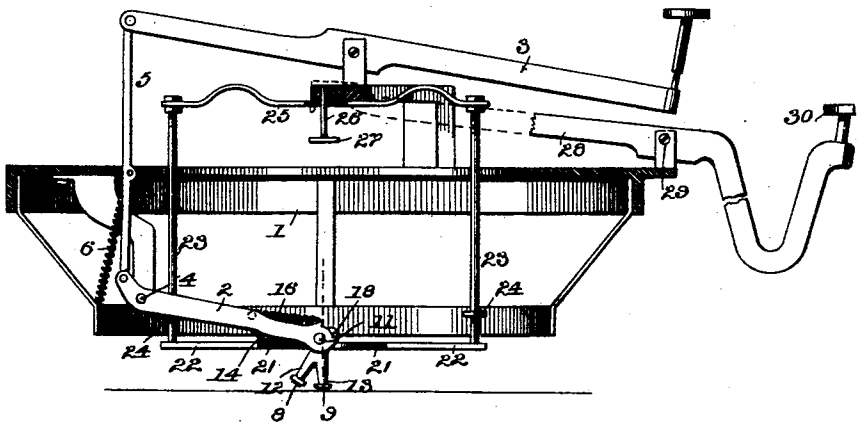
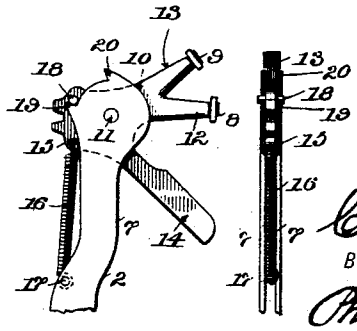


Fig. 3. *Fig. 4.*



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(No Model.) 2 Sheets—Sheet 2.

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KEY ACTION FOR TYPE WRITING MACHINES.

No. 588,135. Patented Aug. 17, 1897.

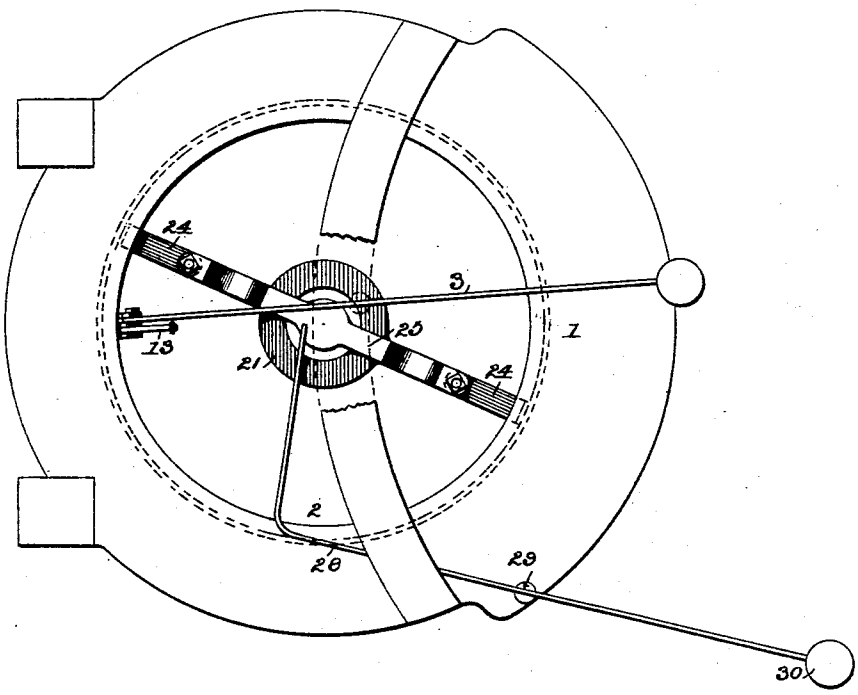

Fig. 5.

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UNITED STATES PATENT OFFICE.

CRAWFORD ELLIOTT, OF NEW YORK, N. Y.

KEY-ACTION FOR TYPE-WRITING MACHINES.

SPECIFICATION forming part of Letters Patent No. 588,135, dated August 17, 1897.

Application filed March 7, 1896. Serial No. 582,235. (No model.)

To all whom it may concern:

Be it known that I, CRAWFORD ELLIOTT, of New York, county of New York, and State of New York, have invented a new and useful Improvement in Key-Actions for Type-Writing Machines, of which the following is a specification.

This invention relates to a key-action for type-writing machines, and has reference more particularly to the manner of mounting the types on the type-bar in order to print capital letters or small letters at will.

The invention consists of certain improvements in the manner of mounting the two types on the bar and in the manner of controlling the movement of said types at will, having in view simplicity of construction and effectiveness of operation.

The invention also consists in the details of construction and combination of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a vertical sectional elevation of such parts of a downwardly-acting or book type-writing machine as are necessary to illustrate my invention, the said parts having my invention embodied therein. Fig. 2 is a similar view with the parts in a different position. Fig. 3 is a side elevation, on an enlarged scale, of the end of the type-bar and types mounted therein. Fig. 4 is an edge view of the same as viewed from the rear. Fig. 5 is a top plan view of the parts illustrated in Figs. 1 and 2.

Referring to the drawings, 1 represents a frame in the form of a ring, on which are mounted a series of type-bars 2, (only one being shown,) actuated by a series of key-levers 3 (one being shown) and arranged to strike downward at a common center on the underlying stationary book or sheet, as the case may be, the said frame being suitably mounted on a fixed base-frame (not shown) in such manner as to be movable laterally and longitudinally with respect to the same to effect the letter and line spacing.

Each of the type-bars is mounted on a horizontal axis, as at 4, connected by a link 5 to the key-lever, and is acted on by a spiral spring 6, which tends to hold the bar yieldingly in a vertical position, as shown in full lines in Fig. 1, but which will permit the bar to turn downward when the key-lever is depressed to a horizontal position, as shown by full lines in Fig. 2. To each type-bar, which in the present instance is formed of two thin metal plates 7, extending side by side parallel to each other, I apply two types 8 and 9, the former a small letter and the latter a capital, the said type being fixed to a plate 10, which extends between the two plates 7 of the type-bar and which is mounted loosely on a pin 11, extending through the parts. The types are fixed to the ends of fingers 12 and 13, which project from the plate 10 in lines radiating from the axis 11, so that when one or the other of the type are moved to an active position and in contact with the sheet on which the printing is received the pressure of the bar thereon will be exerted in a truly vertical line, extending longitudinally through the finger carrying the types and centrally through the axis 11, as shown by dotted lines in Fig. 2. From this construction it will be seen that by reason of the movement on its axis of the plate 10, which carries the type, either the small letter 8 may be caused to strike the paper, as shown by dotted lines in Fig. 1, or the capital letter 9, as shown by full lines in Fig. 2, the change from the small to the capital letter being effected by simply turning the plate 10 on its axis, which action will bring the capital letter into operative active position and move the smaller letter to an inoperative position.

In order to control the movement of the type with reference to the type-bar, I provide the plate 10 with an arm 14 and connect to the edge of the plate, as at 15, one end of a spiral spring 16, the other end of which is fixed to a pin 17, fixed to the type-bar. It will be noted that the arm on the type-plate extends in the direction of the type-bar pivot. The advantage in this construction over that in which the shifting arm extends beyond the end of the type-bar resides in the fact that the collision of the type-bars is avoided or made less frequent. By reason of the arms extending inward the type-bars will not contact at a point as far from the printing-point as in cases where the arm extends beyond the bar, and consequently this construction permits the use of weaker springs, so that the "touch" is lighter and more desirable. The spring tends to hold the plate to which the type are

fixed in the position shown in full lines in Figs. 1 and 3 with the arm 14 extending diagonally from the type-bar and with the small letter 8 in an operative position to print upon the sheet when the key-lever is depressed. By the movement of the arm 14 the plate carrying the types will be turned on its axis against the influence of its spring 16 until the parts will assume the position shown in full lines in Fig. 2, the movement of the plate being limited by a pin 18, fixed thereto at its edge and adapted to encounter two stops 19 and 20, fixed to the edges of the plates composing the type-bar. The arm 14 is adapted to be moved by its engagement with a movable stop 21, which latter is arranged to be moved in the path of the arm or free of the same, according as it is desired to print the small or capital letter. The stop is in the form of a horizontal ring, sustained near the surface of the sheet or book and surrounding the common point at which the types of the several type-bars strike, and it is connected to two oppositely-extending horizontal arms 22, having their outer ends connected to the lower ends of two vertical rods 23, extending upward through fixed guides 24 and connected at their upper ends by a horizontal bar 25, all of these connected parts constituting a rectangular frame which is movable vertically to a limited extent, as will be more fully described hereinafter. At its center the upper bar 25 of the frame contains a hole, through which extends a depending fixed pin 26, which serves as a guide for the upper part of the frame and which is provided on its lower end with a stop 27, to limit the downward motion of the frame. The size of the stop-ring 21 is such that in its normal position, when the key-lever is depressed, the type-bar by moving to a horizontal position will carry the arm 14 vertically over the ring, but not in contact therewith, the plate 10, carrying the type, remaining in its normal position and the small letter in an operative relation to the bar, as shown by dotted lines in Fig. 1. When, however, the ring is lifted in its guides to the position shown in Fig. 2, the depression of the key-lever will move the type-bar to a horizontal position, and the ring being in the path of the arm 14 the latter will contact therewith, be moved relatively, and will turn the plate 10 on its axis, bringing the capital letter 9 in an operative position to print, as shown by full lines in Fig. 2. The stop 21 is in the form of a ring, so that the several type-bars which are arranged in a circle within the frame when striking at a common central point will carry their respective arms 14 in contact with the stop.

The vertical movement of the frame carrying the stop-ring is effected by means of a lever 28, pivoted on a horizontal axis to the ring-frame, as at 29, provided at one end with a finger-key 30 and extended at its opposite end inward toward the center of the ring-frame, where its end is forked to receive the edge of the upper bar 25 of the frame. By the depression of the key-lever 28 the frame carrying the ring will be elevated, thereby lifting the stop-ring to the position shown in Fig. 2, and a depression of any one of the key-levers controlling the type-bars will be followed by the shifting of the type-plate 10 on its axis and the moving to an operative position of the capital letter 9. On the release of the key-lever 28 the gravity of the frame will cause it to drop to its former position with the stop-ring adjacent to the surface of the sheet or book, as shown in Fig. 1, and the depression of any one of the key-levers controlling the type-bars will be followed by the printing of the small letter, as indicated by dotted lines in said figure, the stop-ring being free of arm 14.

It is further to be understood that my invention is applicable to machines which act upwardly and wherein the printing-surface is fixed, in which case the manner of mounting the type would be precisely the same, the only change being in the reversal of the stop to correspond to the change in the direction in which the type-bar strikes.

It is further to be understood that while I have shown the means for controlling the movement of the type with relation to the bar as in the form of a single stop common to all the type-bars individual stops for each type-bar could be provided, but this would necessitate the increase in the number of parts composing the mechanism and would be objectionable in this respect, yet my invention is intended to embrace such a construction.

It is to be understood, again, that while I have described and illustrated my invention as peculiarly applicable to machines wherein the receiving-surface for the printing is fixed and wherein the machine is moved relatively to the surface it is applicable also to other machines wherein the receiving-surface is movable, as in the well-known Remington type of machine, in which case my manner of providing for the printing of the two forms of letter may be substituted for that practiced in these machines—viz., by the shifting of the printing-surface.

Having thus described my invention, what I claim is—

1. In a type-writing machine the combination of a swinging type-bar, a type-plate pivoted on the outer end of the bar on a transverse axis and provided with two types, an arm connected rigidly to said type-plate and extending inward toward the axis of the bar and terminating in advance of said axis, a stop-ring situated inward of the pivotal points of the type-bars and normally out of the path of the said arm and means for moving said ring into the path of the arm to shift the type-plate on the type-bar, substantially as described.

2. The combination with the type-bar comprising two plates connected together with a space between same, a type-plate pivoted between said plates, of two types representing

a small and a capital letter fixed to said type-plate, a stop on the type-bearing plate, two stops on the edge of the type-bar adapted to be encountered alternately by the stop on the type-bearing plate, a spring connected respectively to the bar and the type-bearing plate and tending constantly to hold one of the letters in an operative position and the other inoperative and means for controlling the movement of the latter.

3. The combination with the frame, of the series of type-bars grouped around a central printing-point and arranged to strike downward thereat, plates carried by said bars and movable with relation to the same, a plurality of types fixed to said plates, a stop-ring movable in the path or free of said plates, vertical rods connected to said ring and mounted in guides on the frame, a horizontal bar connecting the upper ends of said rods, and a key-lever pivoted on the frame and connected to said bar.

In testimony whereof I hereunto set my hand, this 6th day of March, 1896, in the presence of two attesting witnesses.

CRAWFORD ELLIOTT.

Witnesses:
CHARLES E. RIORDON,
W. R. KENNEDY.