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METHOD AND APPARATUS FOR FIXING SLOT-BACK TYPES UPON THE TYPE LEVERS OF TYPEWRITERS.

APPLICATION FILED MAR. 23, 1921.

1,428,141.

Patented Sept. 5, 1922.

3 SHEETS—SHEET 1.

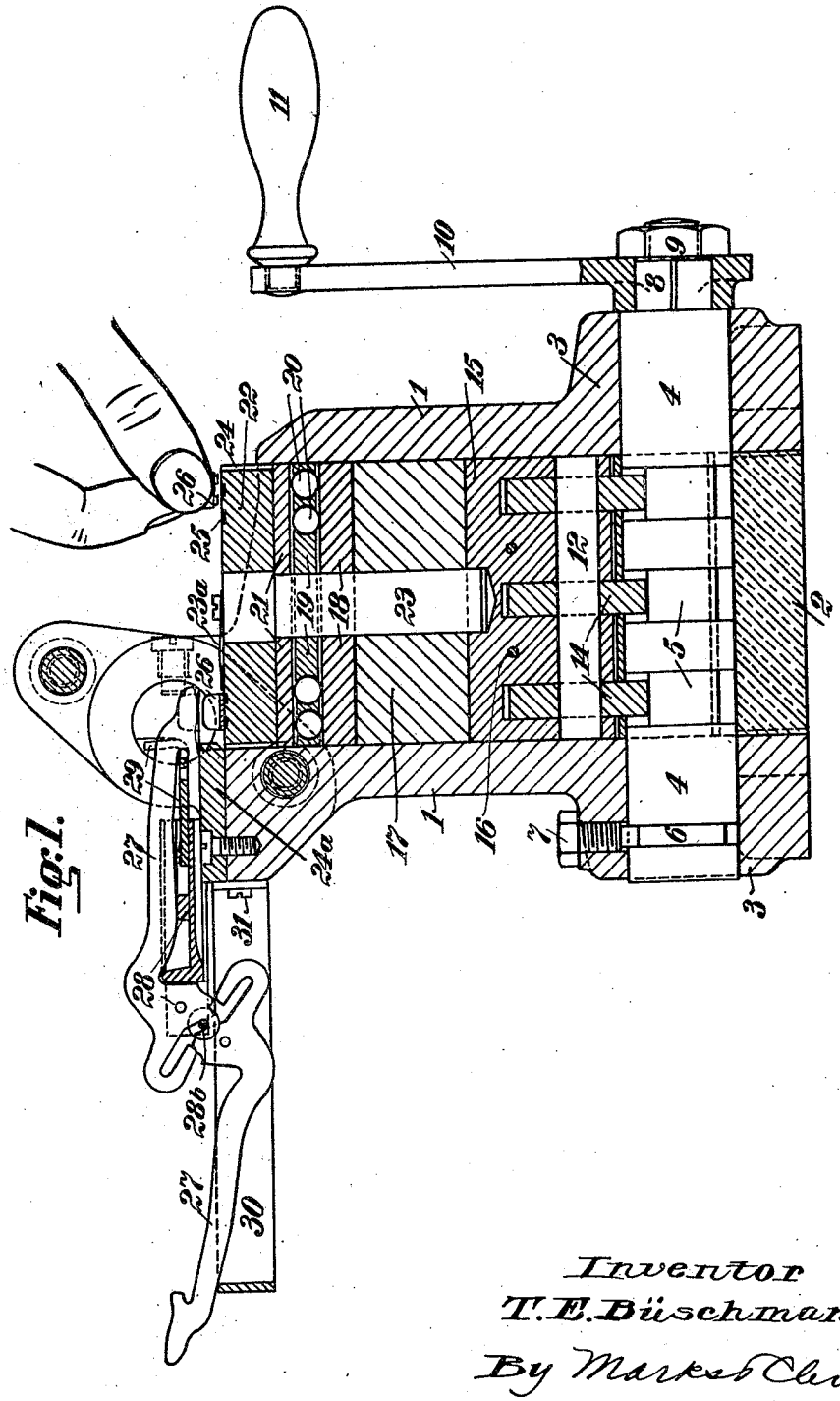


Fig. 1.

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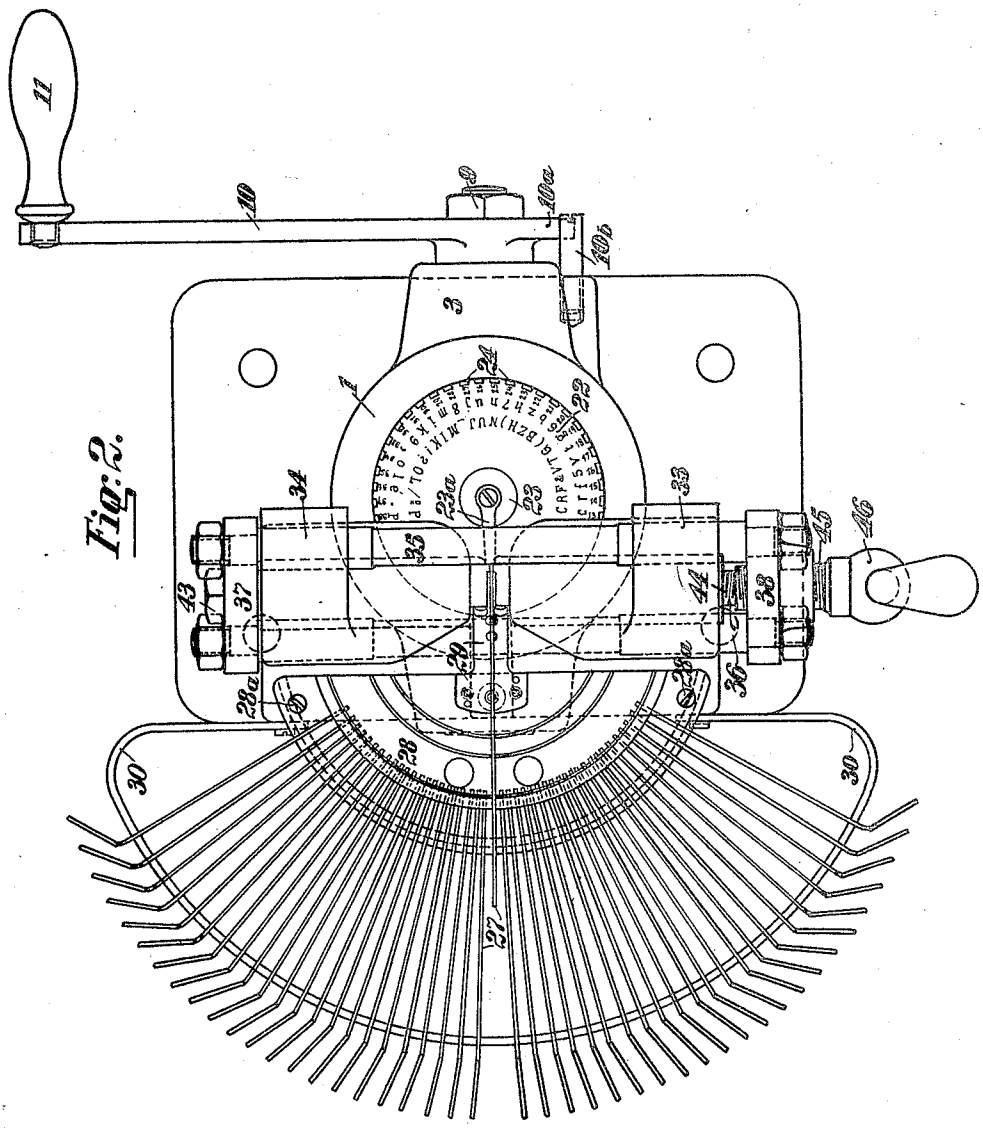
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3 SHEETS—SHEET 2.

Fig. 2.



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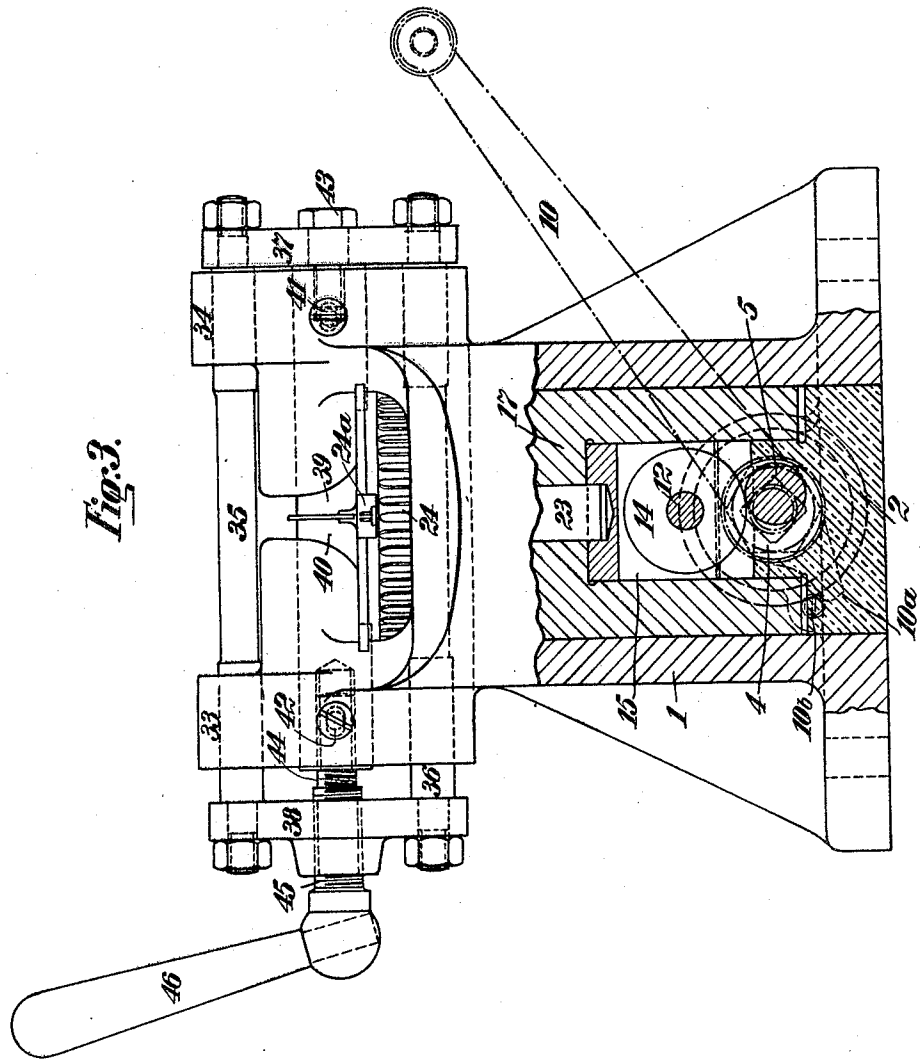
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3 SHEETS—SHEET 3.

Fig.3.



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UNITED STATES PATENT OFFICE.

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METHOD AND APPARATUS FOR FIXING SLOT-BACK TYPES UPON THE TYPE LEVERS OF TYPEWRITERS.

Application filed March 23, 1921. Serial No. 454,944.

To all whom it may concern:

Be it known that I, THEODOR EUGEN BÜSCHMANN, a citizen of the realm of Germany, and residing at Haydnstrasse 9, Chemnitz-Kappel, Germany, have invented certain new and useful Improved Methods and Apparatus for Fixing Slot-Back Types upon the Type Levers of Typewriters (for which I have filed applications in Germany April 2, 1914), of which the following is a specification.

This invention has for its object to provide an improved method and apparatus for fixing slot-back types upon the type levers of typewriters.

Hitherto the types have generally been mounted upon their respective type levers by the said type levers being driven by light and careful blows of a hammer into the middle slot in the back of the type. It has been sought to attain uniformity of the distances of the types from the centre of oscillation of the type levers and the consequent correct alignment by starting from a standard letter, for instance the "H" or the "N", which occupy a central position as regards the order of succession and arrangement of the type levers, and first adjusting their types by means of a gauge. Then the other types have been adjusted according to the said normal types by mounting the type levers in the type lever bearings of the respective typewriter, and by striking and comparing the printed letter with the print of the normal type, ascertaining the difference which has then been compensated by shifting and fixing the respective type higher or lower upon its lever.

The improved method according to this invention is designed to do away with that very tedious process, and consists in this that each type is moved positively upon a corresponding engraved recess of a supporting matrix under its type lever which is held firmly in a known manner, whereupon such a relative movement of the type and the type lever takes place that whilst the types maintain their exact distance from the centre of oscillation of the type lever, the said types are pressed by means of their slot upon the type lever until the correct type height has been attained.

The improved apparatus for carrying this improved method into effect comprises in its preferred form of construction, a matrix adapted to receive the types and formed for this purpose with corresponding engraved recesses, said matrix being mounted in a movable manner upon ball bearings in a lifting device. This matrix may consist of a rotary disc or of a sliding straight bar or straight edge, and it comprises preferably devices by means of which the types mounted thereon can be brought with their slots approximately into a central position to the type lever, whilst the device for holding the type levers is preferably so constructed that during the printing of the types the type levers can be held in their correct positions by clamping jaws which are moved towards each other by means of a part acting after the manner of a differential screw.

The improved method will now be more fully described in connection with the improved apparatus which also forms part of the present invention.

A constructional example of this improved apparatus is illustrated in the accompanying drawings in which:—

Figure 1 is a cross section of the apparatus.

Figure 2 is a plan, and

Figure 3 is a side elevation partly in section.

A casing body 1 provided with a base plate for attachment purposes, is formed with a vertical hole and with a horizontal hole crossing the latter. The vertical hole serves to receive the mechanism for raising the matrix, whereas the horizontal hole serves to contain the driving parts for the raising mechanism. To these driving parts there belongs first a shaft 4 which is mounted in cast-on extensions 3 of the casing 1 and in a closing body 2 which closes the bottom of the vertical hole of the casing, and which shaft comprises raising eccentrics 5 and also a groove 6 by means of which it is guided on the pin of a screw 7. The shaft 4 with the raising eccentrics 5 is further formed with a square portion 8 with a screw-threaded extension and a nut 9, by means of which a crank 10 with handle 11 is fixed on the raising shaft 4. The crank 10 is provided with an extension 10^a which is adapted to strike

a stationary stop 10^b for the purpose of limiting the motion of the crank (Figures 2 and 3). The raising eccentrics 5 act against rollers 14 which are guided and mounted by means of an axle 12 in recesses of a supporting and guiding part 15. This supporting and guiding part 15 is connected by pins 16 to a raising member 17 which is guided in the vertical hole of the casing 1 and on the closing body 2.

On the raising member 17 there is mounted an intermediate plate 18 (Figure 1) and upon the latter there is mounted a ballrace 19 with balls 20 on which rests a second intermediate plate 21 to serve as a support for the matrix 22. The intermediate discs 18 and 21 are guided in the casing 1 and on the vertical axle 23 that can revolve in the parts 17 and 15. The matrix 22 has recesses 25 which are engraved to correspond with the characters of the typewriter, and serve to receive the type. Further there are stamped in the matrix 22, numbers that correspond to the usual numbering of the respective type levers. On the axle 23 there is fixed an adjustable pointer 23^a which bears resiliently upon the matrix 22 and serves to indicate the last inserted type, and consequently to determine the new type to be mounted in position. The matrix 22 is further provided on its periphery with teeth 24 that engage with a striking member or setting device 24^a when the matrix is raised; it serving to bring the desired type with its slot provided in the type body 26, approximately in a central position relatively to the respective type lever 27. The type levers 27 are fixed together with their respective type lever bearing segments 28 by means of screws 28^a upon a corresponding cast-on extension of the casing 1. The bearing segment 28 has further the usual type guide 29 in which there engages a type lever which is thrown over to the front upon which the type is to be mounted.

In general the other type levers are thrown over to the rear and rest upon a bent member 30 fixed by means of screws 31 to the casing 1.

The casing 1 is provided at its upper part with cast-on bearings 33, 34, in the bores of which are guided slide rods 35 and 36, as well as jaws 39 and 40 (Figures 2 and 3). The slide rods 35 and 36 are connected together by connecting flanges 37 and 38. The jaw 39 is fixed by means of a screw 43 rigidly to the connecting flange 37. In a screw-threaded hole in the jaw 40 there is guided a spindle 44 having right hand screw-thread engaging with the internal thread of a second spindle 45 which is formed with left hand screw-thread and which in its turn is guided in a screw-threaded hole in the connecting flange 38. The spindle 45 is provided with a handle 46, so that the entire arrangement of the spindles is equivalent to a differential screw. The jaws 39 and 40 are prevented from rotating by means of screws 41 and 42 engaging in slots in the jaws, whereby there are effected also a limitation of the travel of the jaws as well as a positive opening of the two jaws even if, owing to unequal frictional conditions, one jaw should open earlier and to a greater extent. The jaws 39 and 40 are intended to hold the type levers fast, and are formed with corresponding recesses for the type guide 29, as well as for the pressed-on type or its body 26, so that the type levers are gripped only at their free parts.

The manner of operation of the process or of the apparatus according to this invention is as follows:—

The type to be pressed on, for instance "N," is inserted into the corresponding recess of the matrix 22 at the number "25." Then the pointer 23^a is likewise set to the type "N," and then the matrix 22 is rotated until the type with the slot in its type body 26, comes under the corresponding type lever 27 that has been thrown over forwards into the type guide. This throwing over of the type lever, and likewise the gripping in its working position, takes place preferably before the type are mounted and adjusted, but this need not necessarily be the case. The type lever 27 which, in the present example, likewise bears the serial number "25," is secured in its working position by the fact that by turning the handle 46, the jaws 39 and 40 are moved on to the type lever so as to grip it. By the peculiar action of the differential screw, the result is obtained that the jaws in their adjustment cannot bend the type levers, because if in consequence of a non-uniform position of the jaws, or of a somewhat different position of the type lever, or for any other reason, for instance the jaw 39 should come up first against the type lever, its further travel will be stopped, and then only the jaw 40 will continue to move until in combination with the jaw 39 it likewise begins to grip the type lever. The same thing takes place, but inversely, if the jaw 40 should first come to bear against the type lever.

The mounting of the matrix on balls, and their consequent easy mobility, has the result that the matrix and with it the type, will be able to yield slightly if the slot of the type body should not come exactly under the type lever, so that the type will be adjusted in position in any case, and will not be pressed, say obliquely, on to its lever.

When the type have been brought in the manner above described under their respective type lever which has been turned over and clamped, the cranks 10, 11 are turned

over, and by the resulting rotation of the raising eccentrics 5 on the shaft 4 through the medium of the rollers 14 and the supporting member 15, the raising member 17, and with it the above lying parts 18, 19, 21, as well as the matrix 22, are raised. In this movement the type is gradually pressed with the slot in its body 26 on to the type lever 27. Then by throwing back the crank 10, 11, the matrix is depressed, and after opening the clamping device, the type lever with the type now situated on it, is left behind on the supporting bent member 30. The operation can now begin afresh with another type lever in the same manner.

It will be readily perceived that in this process the type, since the corresponding recesses in the matrix into which the type are placed, are concentric to the axle 23, will all be pressed at the same distance from the axis of oscillation 28^b of the type levers, so that the alignment will be completely assured generally. Further the whole work can be performed away from the typewriter, because the type levers are provided with type in connection with their respective bearing segment.

Naturally it is also possible that the driving of the raising device can be effected mechanically, that is to say, by means of a motor, and that the type can be inserted in their respective recesses in the matrix by means of an automatic feeding and selecting apparatus.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. For fixing slot-back types upon the type levers of typewriters, the combination of a supporting matrix having recesses engraved to correspond to the type characters, means for moving the said matrix under a type lever so as to bring the respective type opposite the said type lever, means for setting the type lever with its centre of oscillation at the proper distance from the type, means for holding the type lever firmly in position and means for causing relative movement of the type and type lever for forcing the type on to the type lever until the correct height has been attained, as set forth.

2. For fixing slot-back types upon the type levers of typewriters, the combination of a supporting matrix having recesses engraved to correspond to the type characters, means for moving the said matrix under a type lever so as to bring the respective type opposite the said type lever, means for setting the type lever with its centre of oscillation at the proper distance from the type, the said means comprising a bearing segment carrying the type levers and a bearing for receiving the said bearing segment, means for holding the type lever firmly in position and means for causing relative movement of the type and type lever for forcing the type on to the type lever until the correct height has been attained, the said means comprising a matrix support intended to be raised and lowered, as set forth.

3. For fixing slot-back types upon the type levers of typewriters, the combination of a supporting matrix having recesses engraved to correspond to the type characters, means for moving the said matrix under a type lever so as to bring the respective type opposite the said type lever, means for setting the type lever with its centre of oscillation at the proper distance from the type, a clamping device for holding the type lever firmly in position comprising two clamping jaws and adjusting and tightening means capable of acting in the manner of a differential screw and means for causing relative movement of the type and type lever for forcing the type on to the type lever until the correct height has been attained as set forth.

In testimony whereof I have signed my name to this specification.

THEODOR EUGEN BÜSCHMANN.

Witnesses:
OSCAR HOLMANN,
GEORG GABLER.