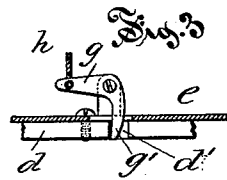
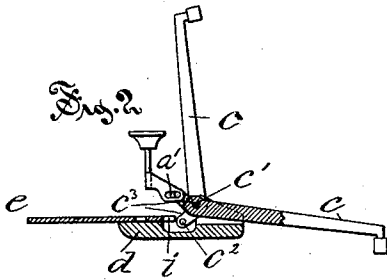
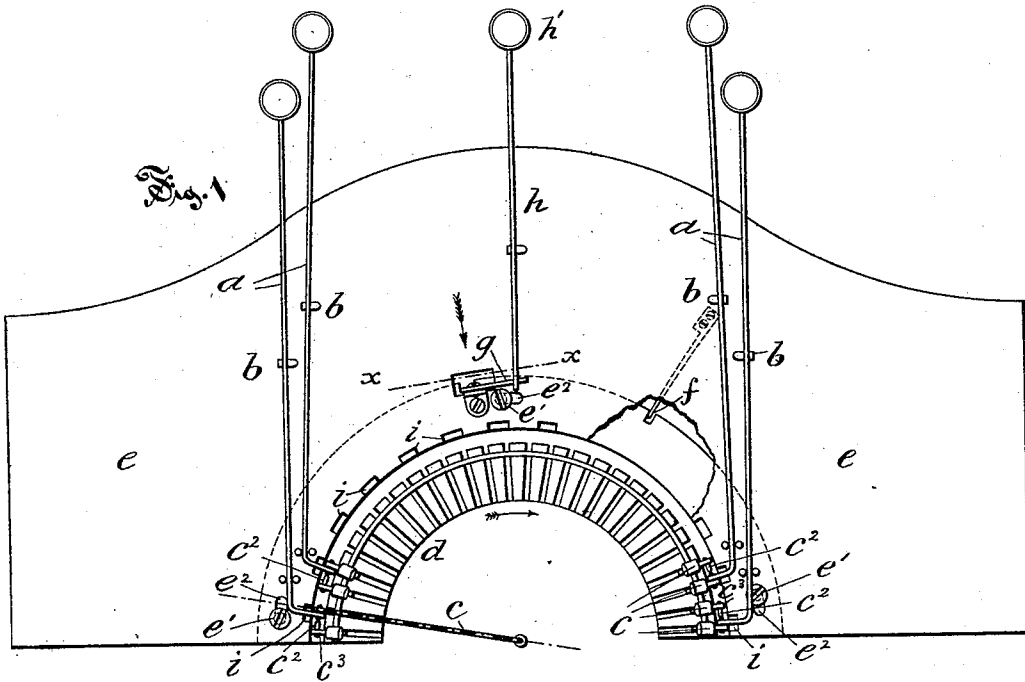


(No Model.)

A. W. CASH.  
TYPE WRITING MACHINE.

No. 428,891.

Patented May 27, 1890.



Witnesses:

W. M. Yorkman,  
H. R. Williams

Inventor:

Arthur W. Cash,  
by Simonds & Burdett,  
attys.

# UNITED STATES PATENT OFFICE.

ARTHUR W. CASH, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE  
TYPOGRAPH COMPANY, OF SAME PLACE.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 428,891, dated May 27, 1890.

Application filed January 3, 1887. Serial No. 223,270. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR W. CASH, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

My invention relates to the class of type-writing machines in which the type is borne on a swinging type-bar that is connected to the key-lever, by the movement of which a given character is printed; and its object is to simplify the construction of existing machines of this class, with particular reference to the mechanism for changing from upper to lower case, or the reverse.

To this end my invention consists in the combination of the type-base with the type-levers and type-bars and interengaging parts, as more particularly hereinafter described, and pointed out in the claims.

Referring to the drawings, Figure 1 is a top or plan view of a type-writing machine with parts broken away, and showing only such part of the frame as is necessary to illustrate the within-described improvement. Fig. 2 is a detail view in elevation of part of the machine, looking from the rear at one side. Fig. 3 is a detail view in section of the parts on line *x x* of Fig. 1, and showing the means of connecting the shifter key-lever and the shifter-slide.

In the accompanying drawings, the letter *a* denotes a key-lever of a type-writing machine; *b*, its pivot-support; *c*, a type-bar pivoted to the type-base *d*, and also pivotally connected to the key-lever. The type-bars *c* are arranged in pairs, the one bearing, preferably, the upper-case or capital letter of a given font, while the adjacent bar of the pair bears the lower-case or small letter of the same font. These type-bars are each pivoted to the type-base, as by pivots *c'*, and have a projecting pin *c''*, that is fixed in the bar and projects toward a similar pin in the adjacent bar of the pair and in line with it. The distance between the ends of these adjacent pins is preferably less than the thickness of the end of the key-lever that is adapted to connect with the bars by means of

the pins that project into a hole or socket *a'* in the end of the lever.

In the form of type-writer shown in Figs. 1 to 3 the type-base is so attached to the frame *e* that it may have a limited sliding movement, the contact of the screws *e'* with the frame at the ends of the slots *e''*, through which the screws pass to attach the type-base to the frame *e*, serving to limit the sliding movement of the base. This sliding movement is a rotary one about the center of the curve of the base, which is the common point struck by each type in making an impression, and this movement is produced in one direction by the shifter-lever *h* and a bent lever *g* or like device secured to the frame of the machine. This shifter-lever *h* bears a pad *h'*, conveniently arranged in the key-board to be reached by the operator, and the inner end of it engages one arm of the bent lever *g*, whose other end *g'* projects into the socket *d'* in the key-base, the result of this combination of parts being that a downward movement of the outer end of the shifter-lever is translated into a sliding movement of the key-base in the direction of the curved arrow in Fig. 1. As the key-levers are all held against sliding movement and have the end opposite the finger-pad of each extending between the pairs of type-bars, the above movement of the type-bars draws the pins *c''* of one set of bars out of engagement with the respective key-levers and causes the pins of the other set to engage the key-levers. As soon as the pressure on the shifter-key is removed the key-base is moved to its first or normal position by means of the spring *f*, that is fastened to the frame and thrusts against a shoulder or side of the socket in the key-base. The edge of the frame *e* conforms closely to the outer ends *c''* of the type-bars, so that one set of these bars cannot be moved to make an impression until by the movement of the type-base each of the set is brought opposite a gap *i* in the edge of the frame. The set of type-bars thus released are of course the set engaged for the time by the several key-levers, while the other set remains locked (see Fig. 2) until the reverse movement of the type-base throws them into engagement with the levers. The space be-

tween the outer ends of adjacent pins being less than the lever in thickness, each of the latter slides upon the pin of the adjacent key before it has left the other pin and is guided  
5 in making the transfer.

I claim as my improvement—

1. In combination with a type-base *d*, bearing two sets of type-bars pivoted thereto, one set of bars bearing type of upper-case and the  
10 other of lower-case, the bars bearing the same letters being arranged side by side, with pins *c*<sup>2</sup> projecting toward each other, a key-lever *a*, having a pin-socket *a'* in the end lying between the bars, whereby a key-lever engages  
15 one set or the other of type-bars, and the shifter-lever *h* and bent lever *g*, all substantially as described.

2. In combination with the type-base *d*, having a limited rotary movement upon the frame

*e*, to which it is attached, as by means of 20 screws *e'* passing through slots in the frame, a double set of type-bars arranged in pairs, so that the same letter of the upper-case and lower-case lie next to each other, the frame *e*, with its edge lying close behind the short 25 arm of the type-bars, bearing the letters of one case, and having gaps *i*, that lie behind the set of type-bars that are in engagement for the time being with the key-levers *a*, whereby while one set of type-bars is locked 30 against movement the other set is free to move in writing, and the shifter-lever *h* and bent lever *g*, all substantially as described.

ARTHUR W. CASH.

Witnesses:

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