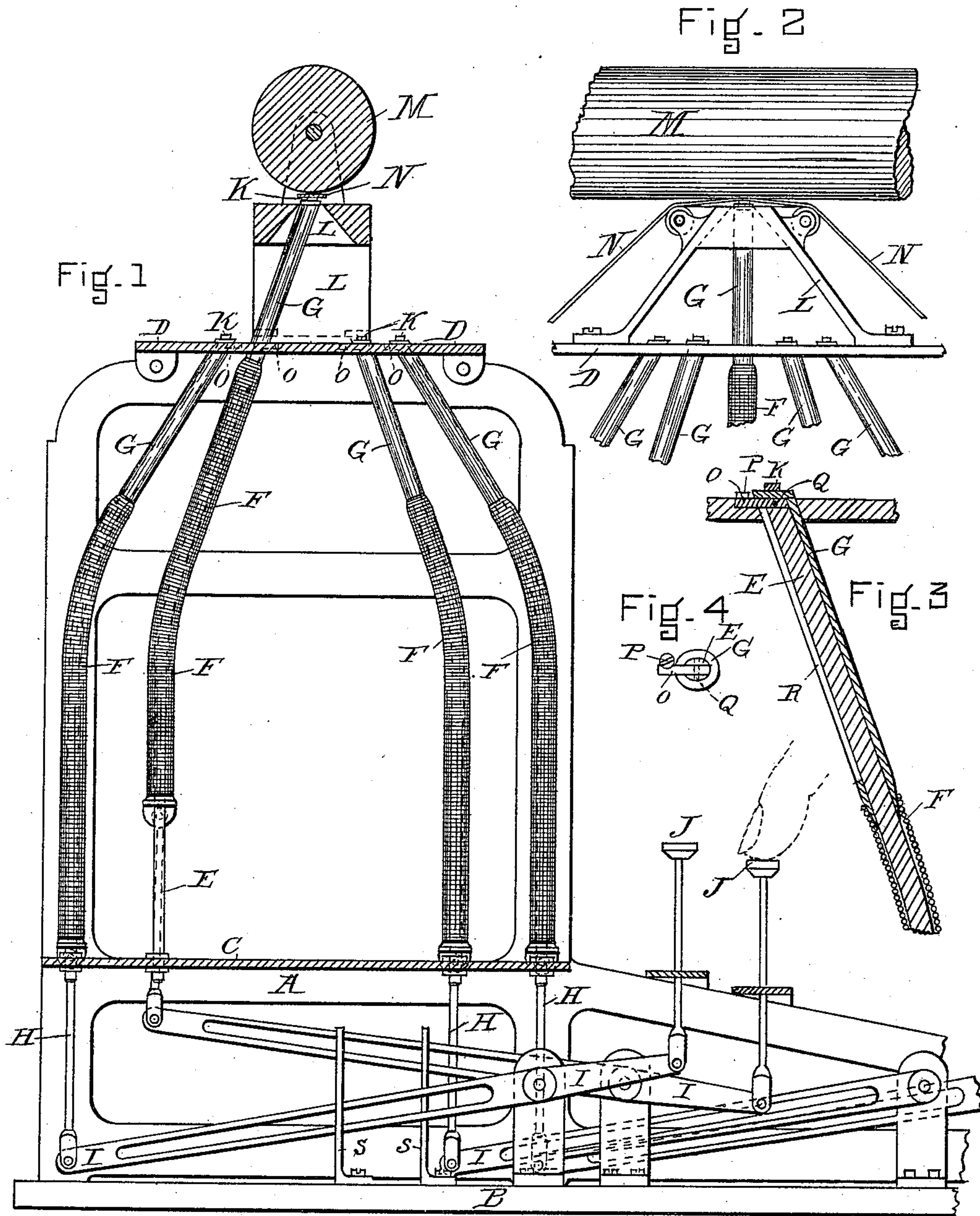


(No Model.)

L. T. FOSS & T. K. KEITH.  
TYPE WRITING MACHINE.

No. 438,916.

Patented Oct. 21, 1890.



WITNESSES

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# UNITED STATES PATENT OFFICE.

LEWIS T. FOSS AND THOMAS K. KEITH, OF BOSTON, MASSACHUSETTS.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 438,916, dated October 21, 1890.

Application filed December 9, 1889. Serial No. 333,138. (No model.)

*To all whom it may concern:*

Be it known that we, LEWIS T. FOSS and THOMAS K. KEITH, both of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Type-Writers, of which the following, taken in connection with the accompanying drawings, is a specification.

Our invention relates to type-writers, and more particularly to certain improvements upon the type-writer shown and described in an application filed by us February 11, 1889, Serial No. 299,425, and allowed November 20, 1889.

Our invention consists of a curved directing-rod, (with a portion near its upper end straight,) a tongue pivoted to its upper end for securing the same to an upper horizontal shelf in the frame, and a slotted tube or sleeve, its upper end type-tipped, so arranged in connection with an elastic spiral plunger as both to work reciprocally outside the curved directing-rod, and also that said slotted sleeve may so work through said upper horizontal shelf.

The object of our invention is to provide a durable, reliable, and cheap type-writing machine.

Our invention consists of various improvements, alterations, and additions to our previous invention, as shown in the accompanying drawings, and hereinafter described.

Figure 1 shows a central section side view of our improved type-writer. Fig. 2 shows a front view of the upper shelf of the frame, type-tipped sleeves, plunger, directing-funnel, ink-ribbon, and feed-roller. Fig. 3 shows an enlarged central vertical section of directing-rod and tongue secured to the upper shelf, elastic plunger, slotted sleeve, and type. Fig. 4 shows a plan view of top of directing-rod and tongue secured to upper shelf by a screw, also slotted sleeve, all as seen looking down upon the upper shelf.

Corresponding letters in the several figures of the drawings designate like parts, referring to which—

A is the vertical frame-work of the machine.

B is the bed-plate, supporting the whole superstructure.

C is the lower shelf, to which the lower ends of the directing-rods are secured and through which the connecting-rods H work, and D is the upper shelf, to which the upper ends of the directing-rods are secured by means of tongues, and through which the slotted sleeve G works.

E is the directing-rod, secured at its lower end to the lower shelf C, and at its upper end by means of a tongue to the upper shelf D.

F is an elastic plunger, made of close wound piano-wire, or other suitable material, and works freely upon the directing-rod E.

G is a slotted sleeve, which works upon or outside of the directing-rod E and through an opening in the upper shelf D. Its lower end is secured to the upper end of the elastic plunger F, and forms a continuation of said plunger. The upper end of this sleeve is tipped with a type.

H is a connecting-rod, which connects the lever-bar I with the elastic plunger F. This connecting-rod works vertically through a hole or opening in the lower shelf C.

I is the lever-bar, which connects the connecting-rod H with the key.

J is the key.

K is the type.

L is the directing-funnel, intended to correct slight inaccuracies in the upward passage of the type-tipped sleeve G.

M is the feed-roller.

N is the ink-ribbon.

O is the tongue, which is pivoted to the upper end of the directing-rod. This tongue is countersunk in the upper shelf D, and secured by a screw.

P is the screw which secures the tongue O to the upper shelf D.

Q is the pivot-pin, which secures the tongue O to the directing-rod E.

R is the slot, which runs the entire length of the sleeve G, and is so made as to enable the sleeve G to work easily through the upper shelf D without interference of the tongue O.

S represents vertical posts secured to the bed-plate B for the purpose of directing the lever-bars I vertically.

In Fig. 1 of the drawings one of the plungers F is represented as raised by pressure



on the key J, the sleeve G as having passed nearly its entire length through the upper shelf D, and the type K pressed against the ink-ribbon N, as it appears when printing a character.

The machine in the drawings is represented, for the purpose of simplicity, with but few plungers.

The method of operating our improved type-writer may be explained briefly as follows: Place the paper to be written upon on the feed-roller M so that it passes between said roller and the ink-ribbon N. Press downward the key J, representing the character or letter desired, with the finger. This pressure raises the opposite end of the lever-bar I, and with it the connecting-rod H, the elastic plunger F, the slotted sleeve G, and type K. The elastic plunger and slotted sleeve slide upon the directing-rod E, which is stationary, and the slotted sleeve passes through the upper shelf D clear of the directing-rod. In its upward passage the sleeve is not impeded by the tongue O, on account of the slot R, which is wide enough to easily receive the tongue O. When the pressure is taken from the key, the lever and plunger return to their former position. The slotted sleeves G pass through the upper shelf D at such angles as all to strike the ink-ribbon N at the same point, and the tongues O, working in the slots

of the sleeves G, prevent the types turning, and thereby secure perfect angles.

By using a directing-rod in place of a directing-tube, as set forth in our former application, the machine can be constructed more cheaply, the friction is less, and, in connection with the slotted sleeve and tongue, is much less likely to get out of order.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. The combination, in a type-writing machine, of an elastic spiral plunger, a slotted sleeve, and type, and a curved directing-rod to guide the same, substantially as shown.

2. The combination, in a type-writing machine, of an elastic spiral plunger, a slotted sleeve, and type, a curved directing-rod to guide the same, and a funnel or guide, all substantially as shown and described in the accompanying drawings and specification.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, on this 3d day of December, A. D. 1889.

LEWIS T. FOSS.  
THOMAS K. KEITH.

Witnesses:

CHAS. A. MAYNARD,  
CLAIBORNE W. KANE.