

(No Model.)

3 Sheets—Sheet 1.

W. S. SCUDDER.
TYPE WRITING MACHINE.

No. 457,673.

Patented Aug. 11, 1891.

FIG-1-

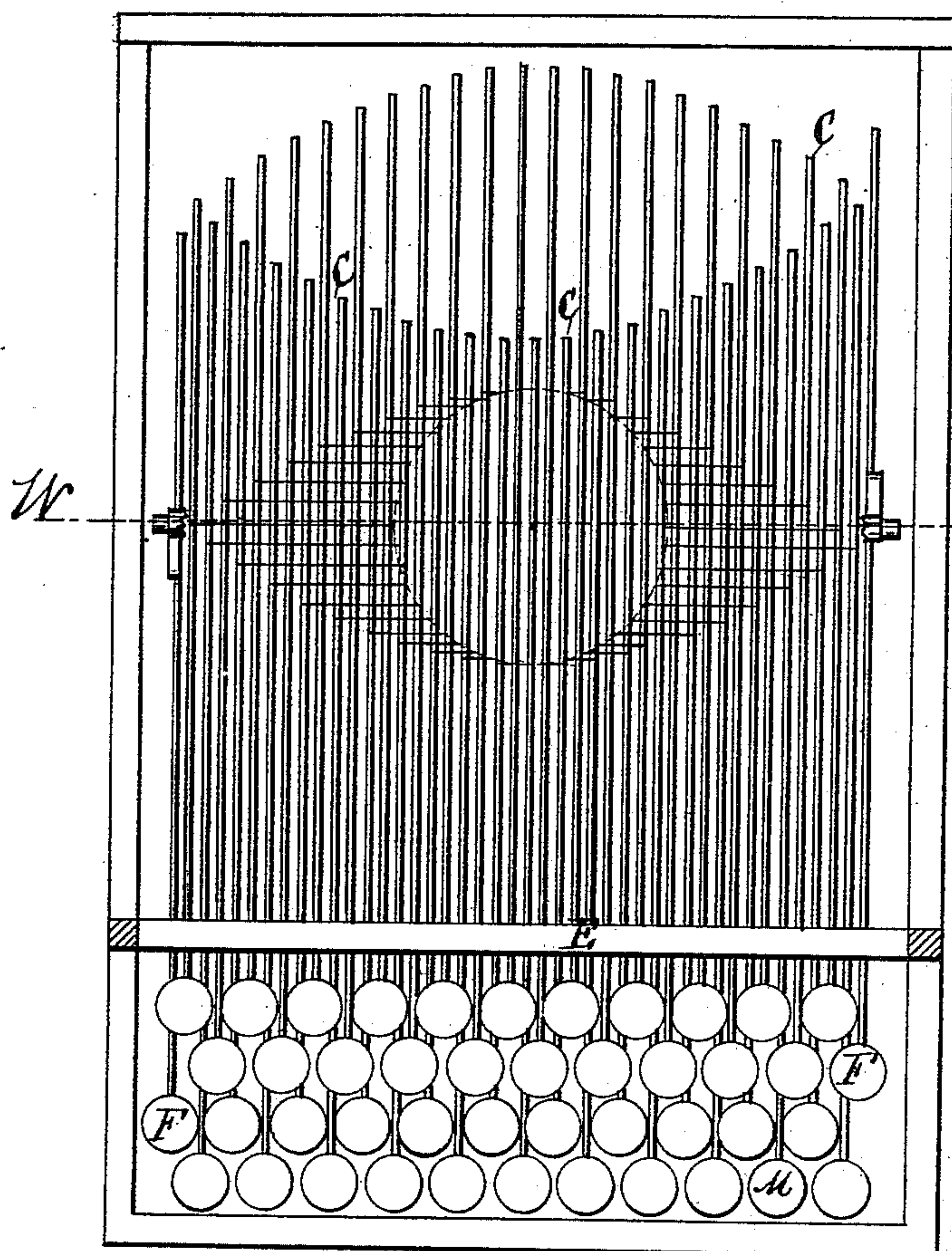


FIG-3-

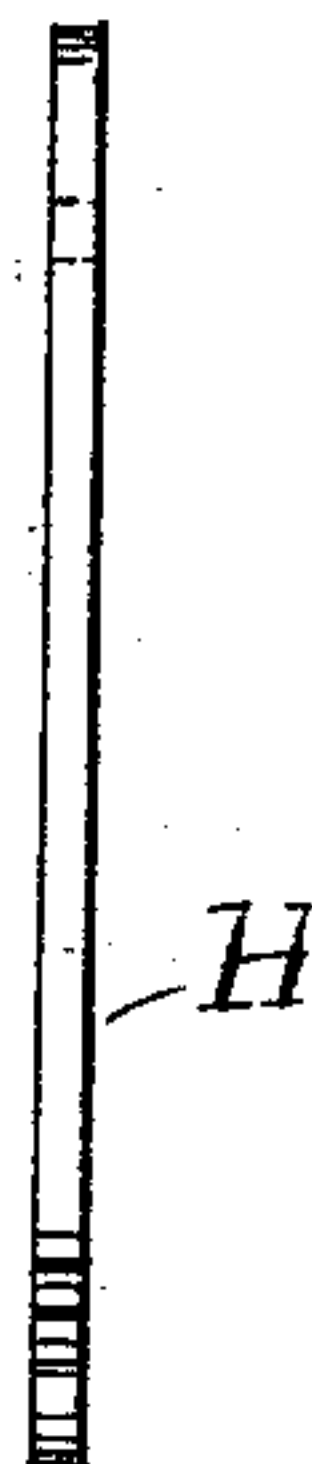


FIG-2-

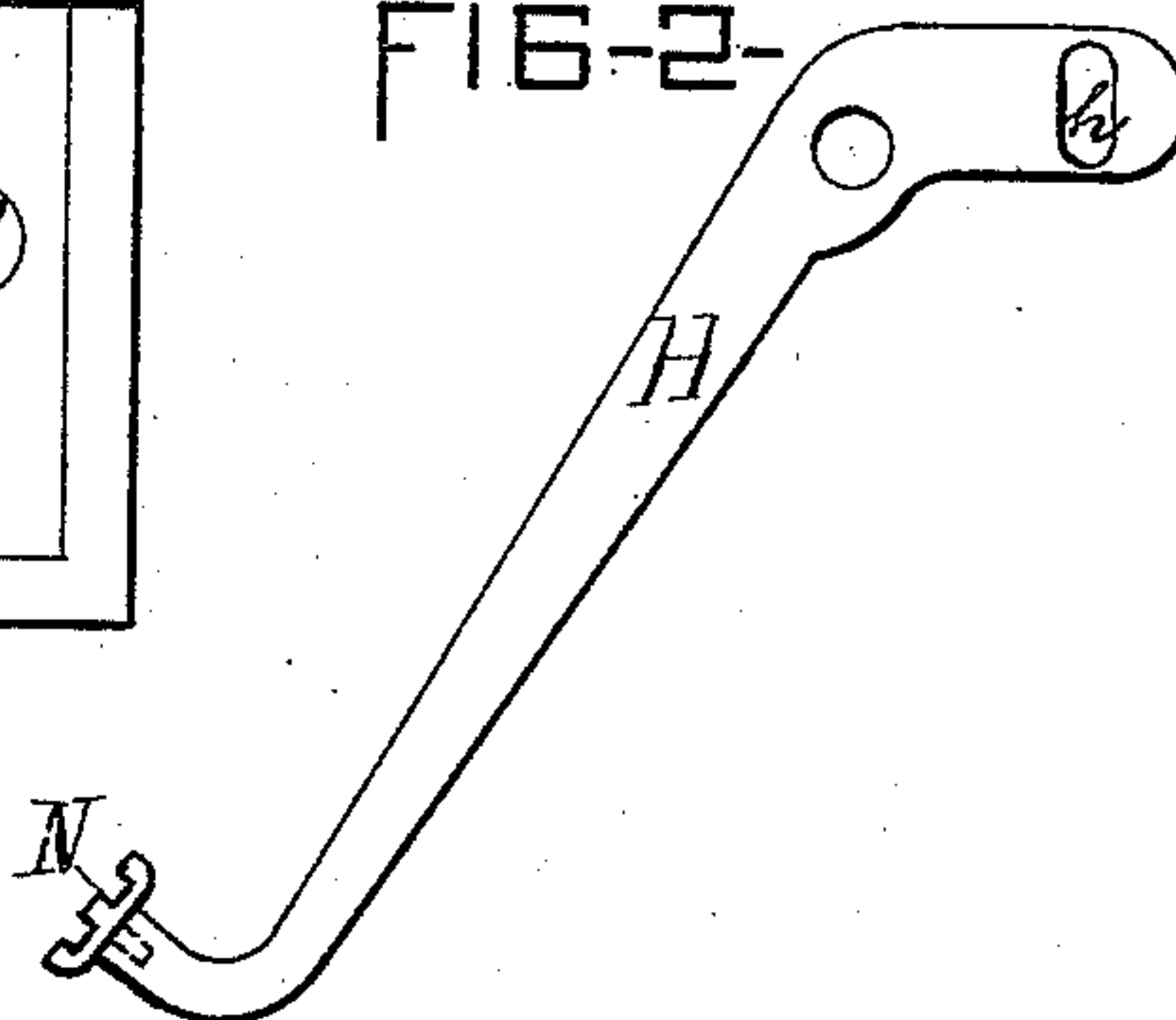
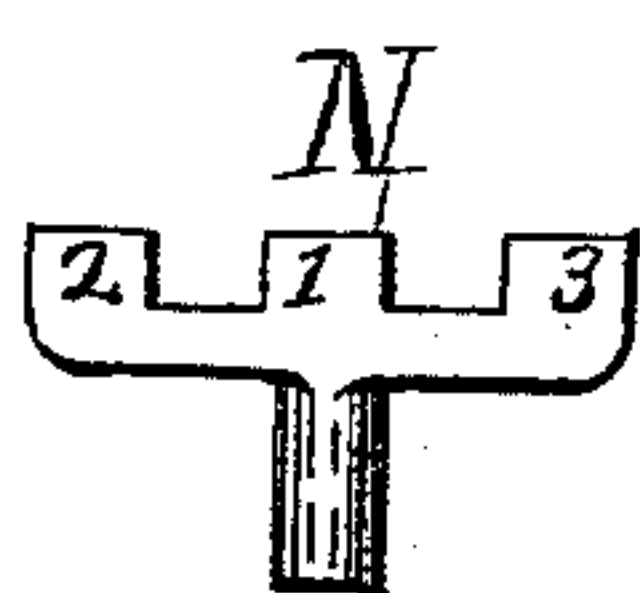


FIG-4-



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(No Model.)

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FIG-5-

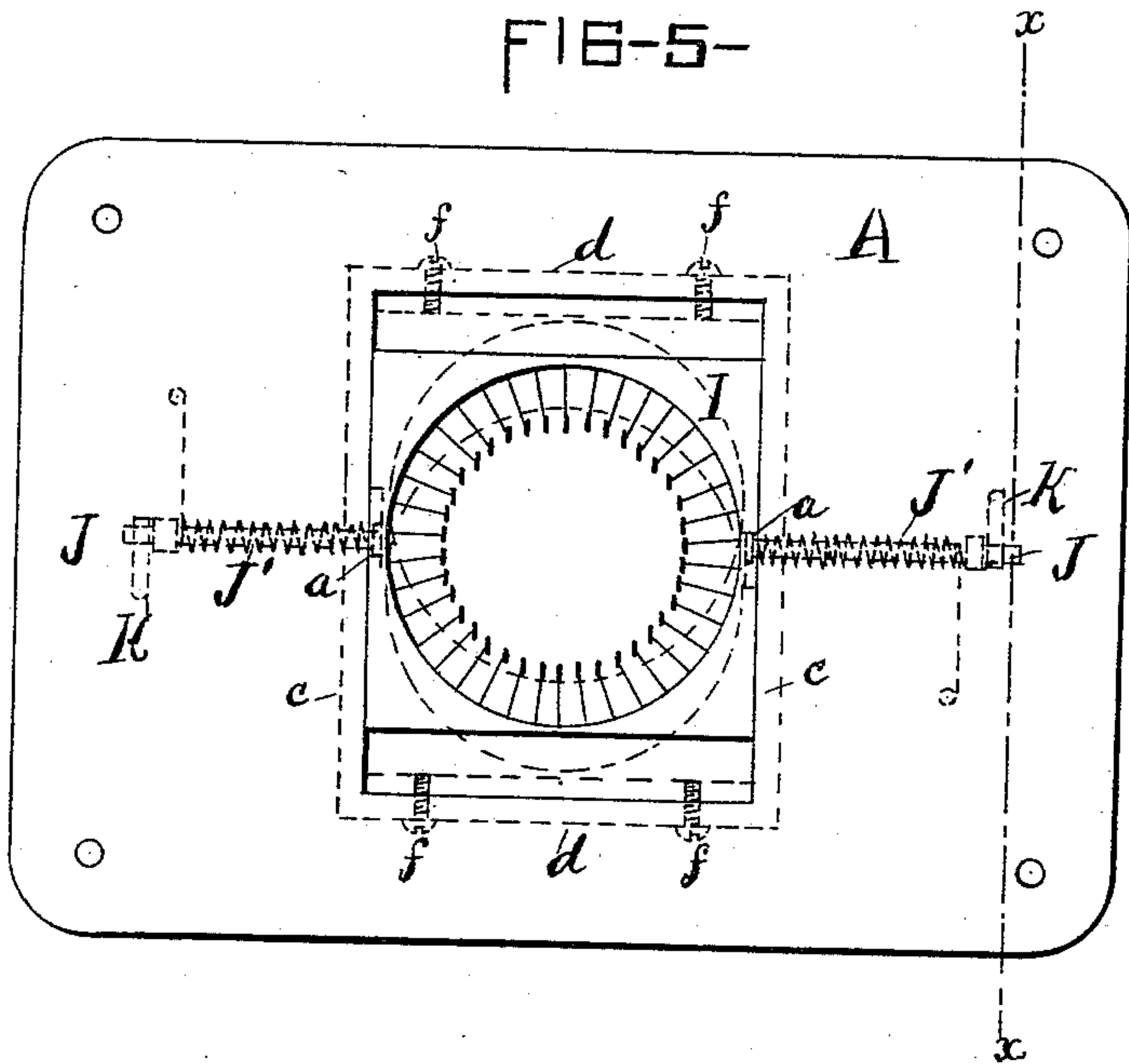
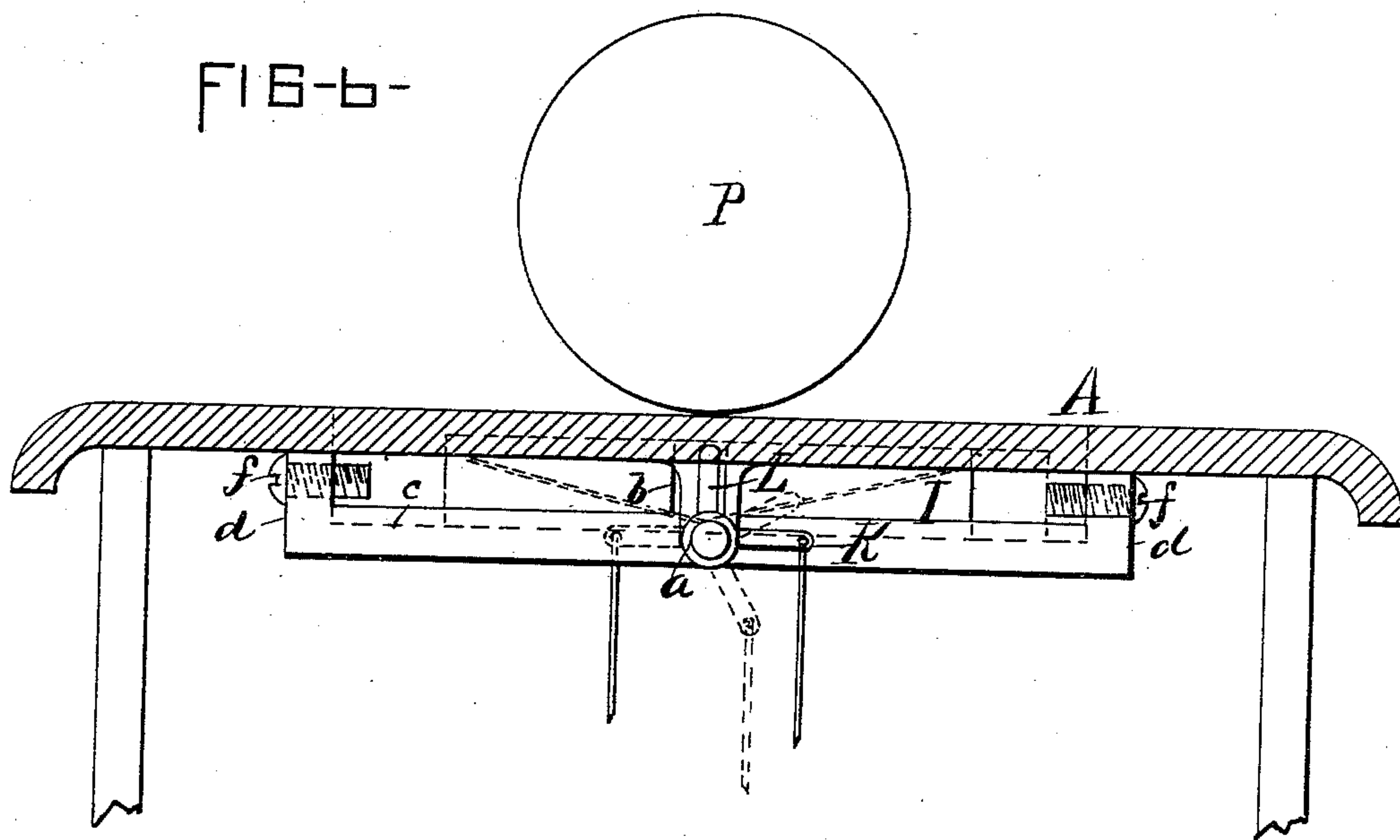


FIG-6-



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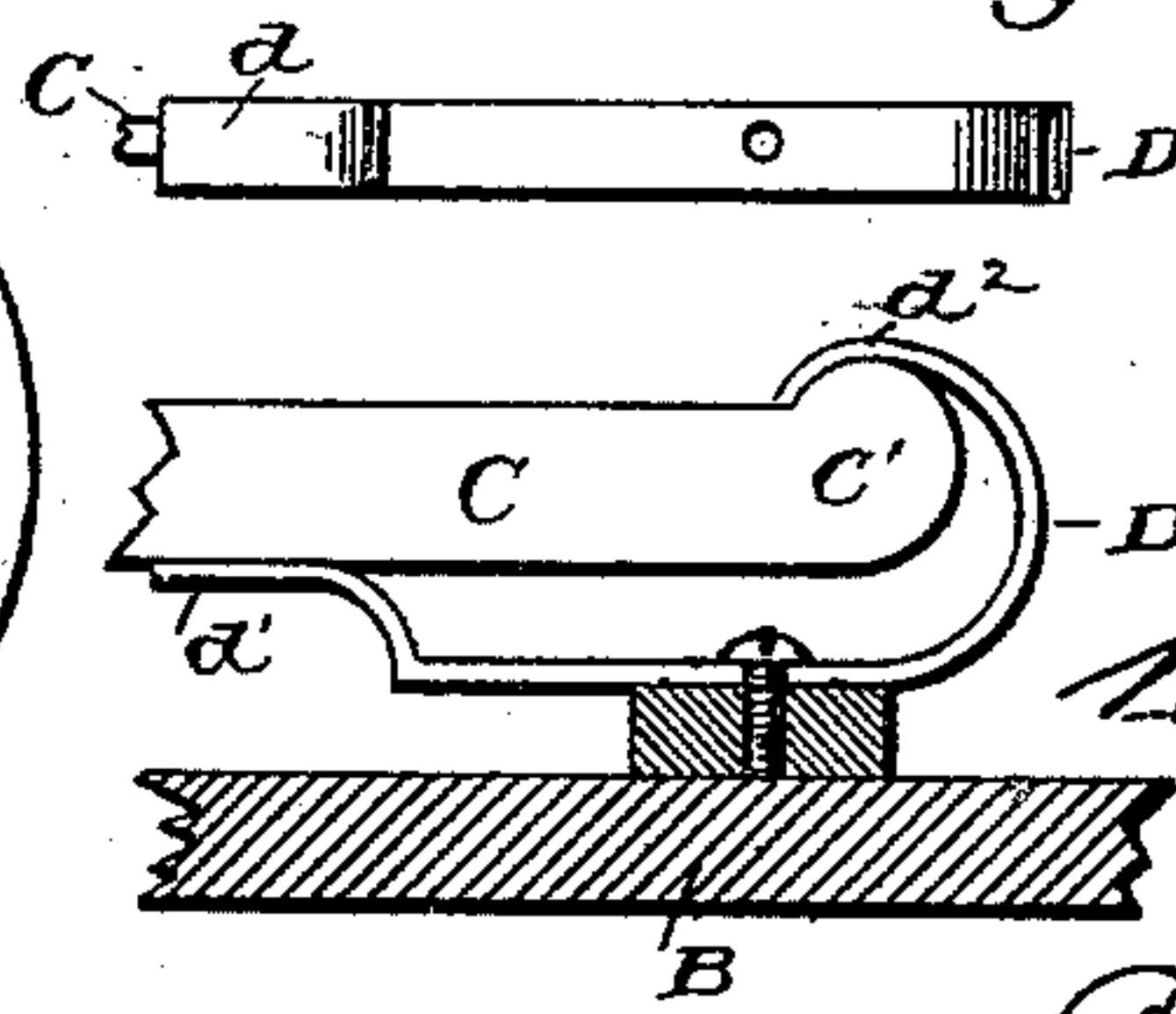
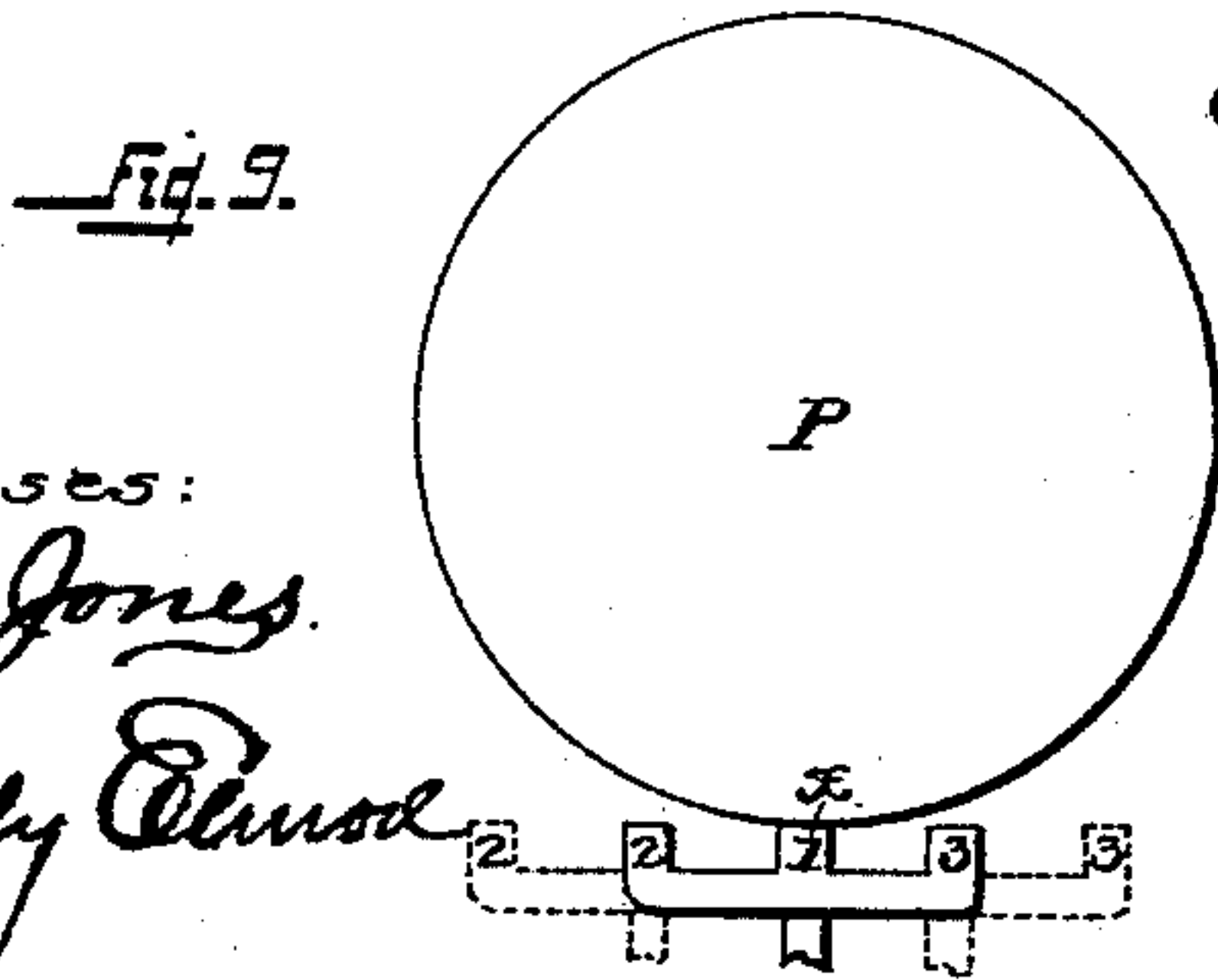
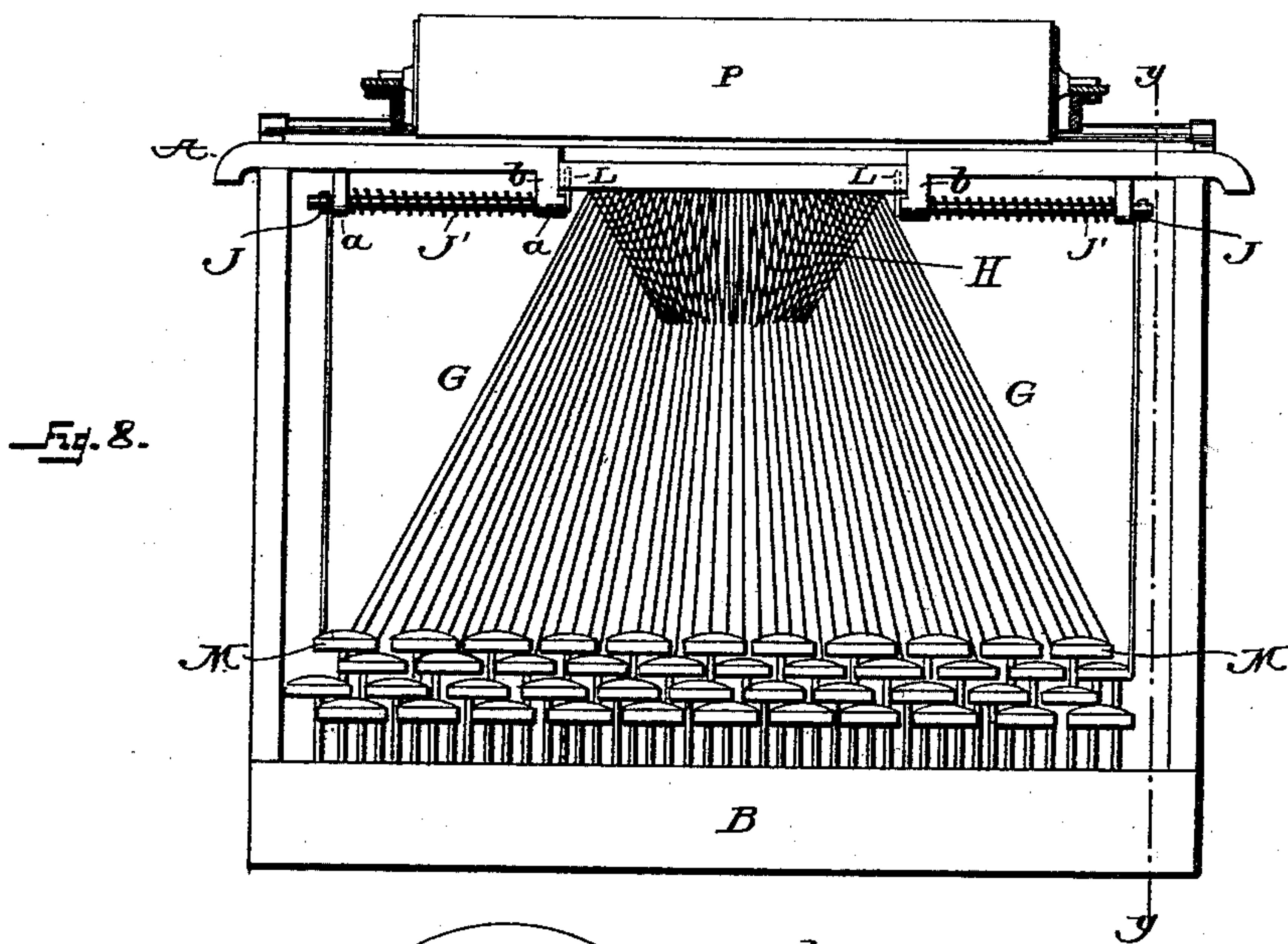
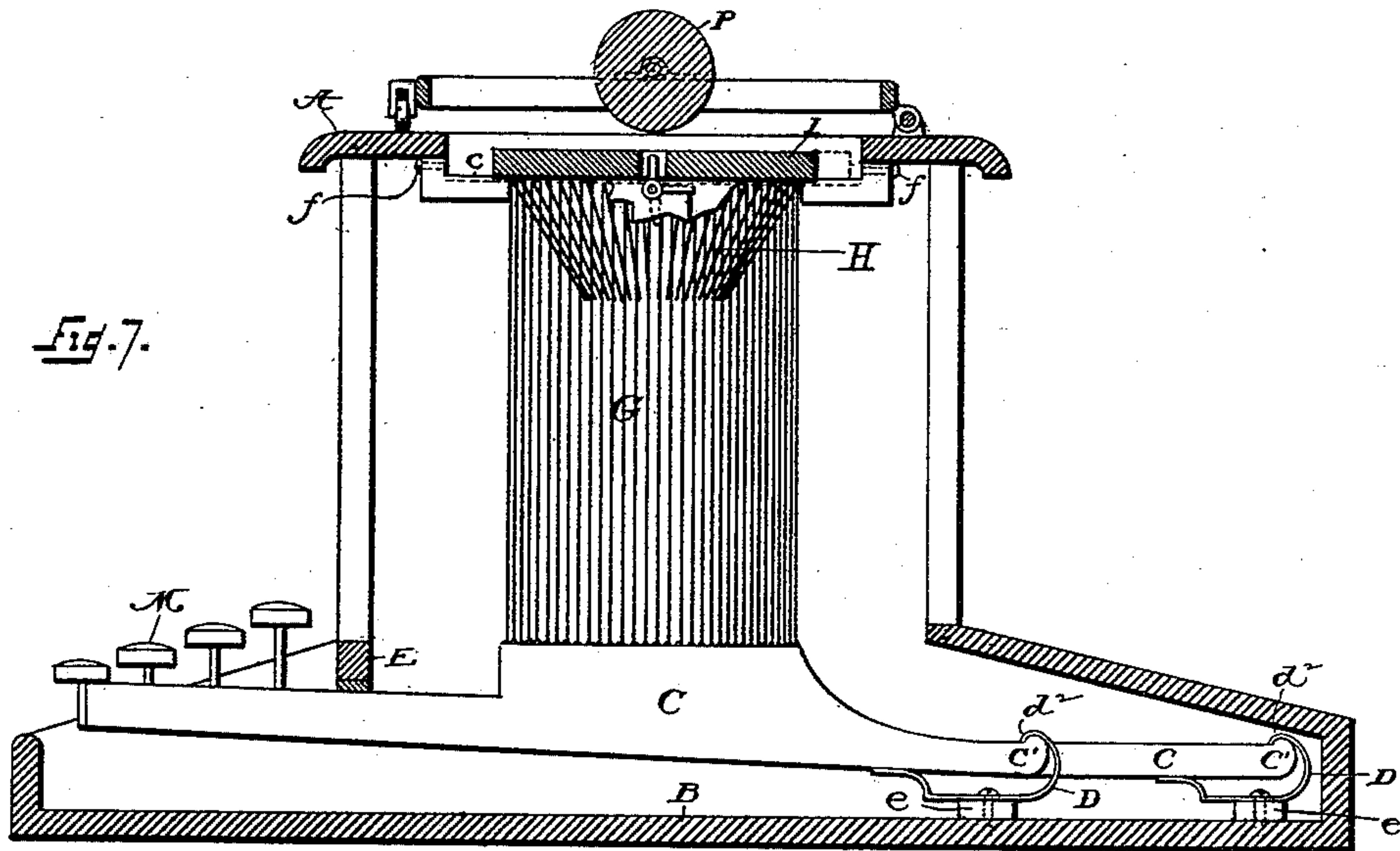
(No Model.)

3 Sheets—Sheet 3.

W. S. SCUDDER.
TYPE WRITING MACHINE.

No. 457,673.

Patented Aug. 11, 1891.



Witnesses:
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J. Stanley Elwood

Inventor:
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By his Atty-
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UNITED STATES PATENT OFFICE.

WILBUR S. SCUDDER, OF SYRACUSE, NEW YORK.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 457,673, dated August 11, 1891.

Application filed November 1, 1886. Serial No. 217,738. (No model.)

To all whom it may concern:

Be it known that I, WILBUR S. SCUDDER, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and
5 useful Improvements in Type-Writers, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to the class of type-
10 writers known as "lever-machines," in which a key-lever is actuated by striking a button marked with the letter corresponding to the type on the type-bar and transmitting the motion of the key-lever by means of a connect-
15 ing-wire to the type-bar, causing it to present the letter thereon to a common center or printing-point; and the object of the invention is to enlarge and increase the type system of machines of this class without increasing the
20 number of keys and key-lever connections.

To this end my invention consists in combining with the movable paper-carriage a horizontally-movable frame or carriage carrying the series of swinging type-bars, each
25 of which is provided with two or more type, so that by moving the frame the type-bars and their pivots may be shifted so that the bars will present one or another of their series of type at the printing-point as may be
30 demanded.

It consists also in the detail, construction, and arrangement of the parts, as hereinafter more particularly described, and pointed out in the claims.

35 In specifying my invention reference is had to the accompanying drawings, in which like letters indicate corresponding parts.

Figure 1 is a plan view of my improved type-writer with the upper part of the machine removed, showing the arrangement of the key-levers and connecting-wires for the type-bars. Fig. 2 is an enlarged detached detail of one of the type-bars, showing the construction and arrangement of the same. Fig.
40 3 is a face or front view of the same. Fig. 4 is an enlarged detached view of the type-head of the type-bar shown in Fig. 2. Fig. 5 is a top plan of the upper part of the machine, illustrating the type-basket mounted upon its
45 adjustable support, showing the levers for shifting the support back and forth, the different positions of the support, and the type-

basket being dotted in. Fig. 6 is a sectional view taken on line *x x*, Fig. 5, illustrating the support for the type-basket and the shifting
55 mechanism and its connections. Fig. 7 is a transverse section taken on line *y y*, Fig. 8, showing the construction and arrangement of the type-basket support and the normal position of the shifting-lever. Fig. 8 is a front
60 view of the type system and its adjustable support, illustrating the oppositely-acting springs mounted on the actuating-shafts. Fig. 9 is a diagram showing the type-head in its different positions in relation to the platen,
65 the full lines showing the normal position and the dotted lines the position when shifted; and Fig. 10 is an enlarged detached bottom plan and side view, respectively, of the spring-seat for the end of the key-levers, the side
70 view being partly in section.

A is the top plate of a type-writer, upon which is mounted the carriage and platen in the usual manner common to type-writers of this class. In the top plate I provide bear-
75 ings *a a*, Fig. 6, lugs *b b*, rabbets or slides *c c*, and side flanges *d d*. The top plate is preferably cast with the parts mentioned formed integral therewith. The slides *c c* form ways into which the supporting-frame I, Figs. 5, 6,
80 7, and 8, is movably seated, for the purpose hereinafter explained.

B is the base of the machine, having lugs *e e*, Fig. 7, cast therewith, for the purpose of attaching the spring-seats of the key-levers,
85 hereinafter described. The key-levers are denoted by C.

D, Figs. 7 and 10, is the spring-seat for the key-levers, the function of which is to aid or assist in returning the levers to their neutral
90 position after the key-button has been depressed.

E, Figs. 1 and 7, is the cushioning-bar arranged across and over the key-levers, as shown in Fig. 1, to limit the upward move-
95 ment of the button-carrying end of the key-levers as they return after having been depressed.

F F are the keys on opposite sides of the key-board, to which the connecting-rods of
100 the shifting mechanism are attached, and the said keys serve to actuate the same when they are depressed by the operator.

G G are the connecting-wires attached, re-

spectively, to the key-levers and to the type-bars.

The type-bars are denoted by H, and are constructed as best shown in Fig. 2, being provided in the end next to the pivot with a slot *h* and the type-head N on the opposite extremity. The type-bars H are pivoted in the type-basket, as shown in Figs. 5, 7, and 8, and strike to a common center or printing-point of the machine.

I is the horizontally-adjustable support for the type-basket, and is mounted in the rabbeted slides *c c* of the top plate A, as best shown in Figs. 5, 6, and 7 of the drawings. The support I is provided with a circular opening, in the periphery of which is mounted the type-basket consisting of a series of type-bars H, pivoted or hung peripherally around the circular opening in I and of suitable length to strike to a common center or printing-point, in the well-known manner common to type-writers of this class, the type-bars being connected with the connecting-wires G G, hooked into the slots *h* of the type-bar. The adjustable support I has slots *i i*, Fig. 7, in its opposite sides and shafts J J, carrying arms or cranks L, Figs. 7 and 8, lying loosely in the slot *i*, and a crank-arm K, formed on the opposite end of the shafts J and connected to the shifting-keys F by connecting-wires, serves to shift the movable support I and the type-basket rectilineally at right angles to the printing-line of the machine.

It will be understood that in this as in other machines of this character the line of printing, as represented upon the paper on which impressions are received, extends transversely of the machine, and the printing-point herein referred to is a central point upon this line, at which all of the type-faces are gaged to strike accurately when actuated by their respective keys. To bring either of the different varieties of type upon the type-bars into position to strike at this common printing-point, the frame on which they are hung is shifted, as described, longitudinally of the machine at right angles to what is herein designated as the "line of printing"; but it will be, of course, understood that the printing-point, or point at which the impressions are received, never changes, the type-bars being so hung and gaged that they always strike at this point, though by the shifting of their frame the particular type-face which is desired for use is brought into position for striking at the common point of impression.

It is to be observed that the shafts J J and their crank-arms K K are reversely arranged, as best shown in Fig. 5, so that when the right-hand crank K and its shaft J, Fig. 5, is actuated by the right-hand shifting-key F the support I is moved forward, and when the opposite shaft J and its crank K is operated by the left-hand shifting-key the support I moves rearward toward the operator. The movement of the type-basket support I is gradu-

ated to correspond to the distance between the types 1, 2, and 3, secured in line with each other upon the type-head N, Fig. 4, so that when it is desired to shift the type system the support I is moved sufficiently in either direction, according as the right or left hand shifting-key F is operated to bring either the type system 3 or 2 to a common printing center, it being understood that the platen P of the machine is axially arranged over the common printing-point of the machine and is fixed in that position when the type-writer is operated.

In order to graduate or limit the horizontal movement of the support I in either direction, so as to secure the proper position of each type system when the support is shifted, I provide the adjusting-screws *f f f f*, which pass through the flanges *d d* and form stops, as shown by the dotted lines in Fig. 5, and accomplish this desirable result.

Upon the reversely-arranged shafts J, I mount spiral springs J' J', Figs. 5 and 8, which torsion the shafts J J and serve to assist the return of the movable support I to its normal position, where it may be locked by any suitable locking device, which is released upon the depression of the shifting-keys F F, hereinbefore referred to. The action of the springs J' J' is against each other, as will be observed upon reference to the drawings, so that while the tension of one increases the tension upon the other is released and the return of the movable support I is greatly facilitated.

No particular device for locking the shifting-frame I in position is herein shown, as many such devices are well known in mechanics, and it forms no part of my present invention.

As the type-bars are pivoted in a circle about the opening in their supporting-frame and are connected by wires with the actuating key-levers, it will be evident that if these key-levers are of the same length and the connecting-wires joined to them at different distances from their pivotal points (as is rendered necessary by the circular arrangement of the type-bars) the leverage and consequent extent of movement given to the key-levers would vary considerably; and to obviate this I construct the key-levers, as in Figs. 1 and 7, of various lengths and pivot them in the base of the machine at regular distances from the impression-point. This will be best seen in Fig. 1, and it will be observed therein that the pivotal points of the levers and the points of their connection with the wires actuating the type-bars form the two ellipses therein shown, and the movement of the type-bars and their shifting-frame is compensated for by the slots *h* in the type-bars, as shown in Fig. 2, so that this shifting is readily admitted without any disturbance of the key-levers or their connecting-wires, which operate equally well with the type-bars in either position.

On reference to the drawings it will be seen that in my machine the key-levers, instead of having a common axis or being mounted on coincident axes, as usual, have their pivots
5 arranged out of line with each other, and that the distance between the pivot of the key-lever and the point of attachment of the wire is substantially the same in all the levers.

The key-levers C are arranged in close
10 proximity to each other in the base of the machine, as shown in Fig. 1, and the rear ends of the levers C are provided with the curved projection C', as best shown in the enlarged side view, Fig. 10. A double-acting spring
15 secured to the lugs e, same figure, bears at d' on the under side of the levers C, and at d² embraces the curved projection C' of C, and this spring forms a pivotal spring-seat D. The lever C is thus yieldingly pivoted in the
20 base of the machine, and the function of the spring-seat D is to return or to quicken the return of the key-levers to their normal position after having been depressed for the purpose of operating the type-bars connected to
25 the said levers.

It will be understood that the return of the key-levers C is partially by gravity of the type-bar, the weight of which overcomes that of the key, and partially by the action of the
30 spring pivot-seat D, which greatly quickens the action of the lever, as will be readily seen.

The type-bar, as has been previously explained, has arranged upon the type-head N, preferably, three styles of type, and the line
35 of the head is at right angles with the printing-line, and the type buttons or keys M are provided with characters corresponding to the same styles of type. Hence any one of the styles of type carried by the type-head N is
40 struck from the same type-button. Hence when the machine is operated by depressing the button M the type-bar with its type is caused to vibrate on its pivot toward the center of the circle upon which it is hung, and
45 upon reaching the center imprints the letter through an inking-ribbon to the paper supported on the carriage.

When it is desired to shift the type system, so as to bring a new field into action, either
50 of the shifting-keys, according to whether the right-hand or left-hand keys are actuated when depressed, causes the shaft J through the medium of the connecting-wire, to rotate, and motion is communicated to the type system, and the support I is moved at right angles to the line of the platen P, where it is temporarily locked by any suitable device, and thus the desired system or field of type is in place to be brought into operation. Now
55 since the movement of the entire system corresponds to the distance apart of the type arranged on the type-head N, it must necessarily follow that either the types 2 or 3 are brought to the printing-point, as is best illustrated in
60 the diagram view Fig. 9, the letter x denot-

ing the printing-point on the platen P and the dotted lines showing the position of the type-head when shifted either to the right or left. After the shifting-key has been depressed to shift the type system into a new field, as de-
70 scribed, the operator by actuating the same type-key utilizes the new type-field, and by releasing the shifting-key the support and type system mounted therein is retracted to its normal position, when by simply depress-
75 ing the opposite shifting-key the type system is again changed and the remaining field brought into operation. The shifting-keys may be depressed by the operator, using his
80 finger for that purpose and holding the same in its depressed position while using the new field of type, or any of the knee-shifts common to the art may be used for the purpose of depressing the key-button and holding it
85 in position.

My invention is not limited to any precise construction of the movable frame which sustains the type-bars, nor to any particular construction and arrangement of the devices
90 for shifting the same. The details may be modified at will, provided a mode of action essentially such as herein described is se-
95 cured. By the expression "different styles of type" as herein employed I mean type of different patterns or different fonts or upper and lower case letters of the same font.

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

1. In a type-writer, a movable frame or
100 support formed with a circular opening and a series of type-bars each provided with two or more type-faces and hinged around the periphery of the circular opening in the mov-
105 able frame, in combination with the main frame of the machine, and means, substantially as described, for shifting the type-frame longitudinally to bring either of the various
110 type-faces into position for striking at the common printing-point, substantially as and for the purpose set forth.

2. A horizontally-sliding frame carrying a series of pivoted type-arms, in combination with a paper-carrying carriage which moves in a direction at right angles to the direction
115 of movement of said sliding frame, and mechanism for moving said sliding frame, substantially as described.

3. The combination of the sliding frame, the type-arms mounted thereon, a spring for
120 returning the frame, a rock-shaft having an arm for operating the frame, and mechanism for operating the rock-shaft, substantially as described.

4. The combination, in a type-writer, of a
125 movable type-system frame or support I, top plate A, provided with the bearing a, the crank-shaft J, having crank-arms K L, one of said arms L engaging the slot i in the sup-
130 port I and the other arm K connected to a

shifting-key F, and the shaft J, provided with a spiral spring J', all substantially as and for the purpose set forth.

5 5. In a type-writer, a series of parallel finger-key levers, having their axes arranged in an elliptic line, in combination with a circular series of type-arms and wires connecting the respective arms and levers, said wires connected to the levers at substantially uniform distances from their pivots, whereby
10 the resistance and the length of movement of the levers are equalized.

6. In a type-writer, in combination with a

key-lever C, the spring-seat presenting the overturned portion d^2 and the underlying portion d' . 15

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 20 18th day of October, 1886.

WILBUR S. SCUDDER.

Witnesses:

FREDERICK H. GIBBS,
E. C. CANNON.