

No. 662,393.

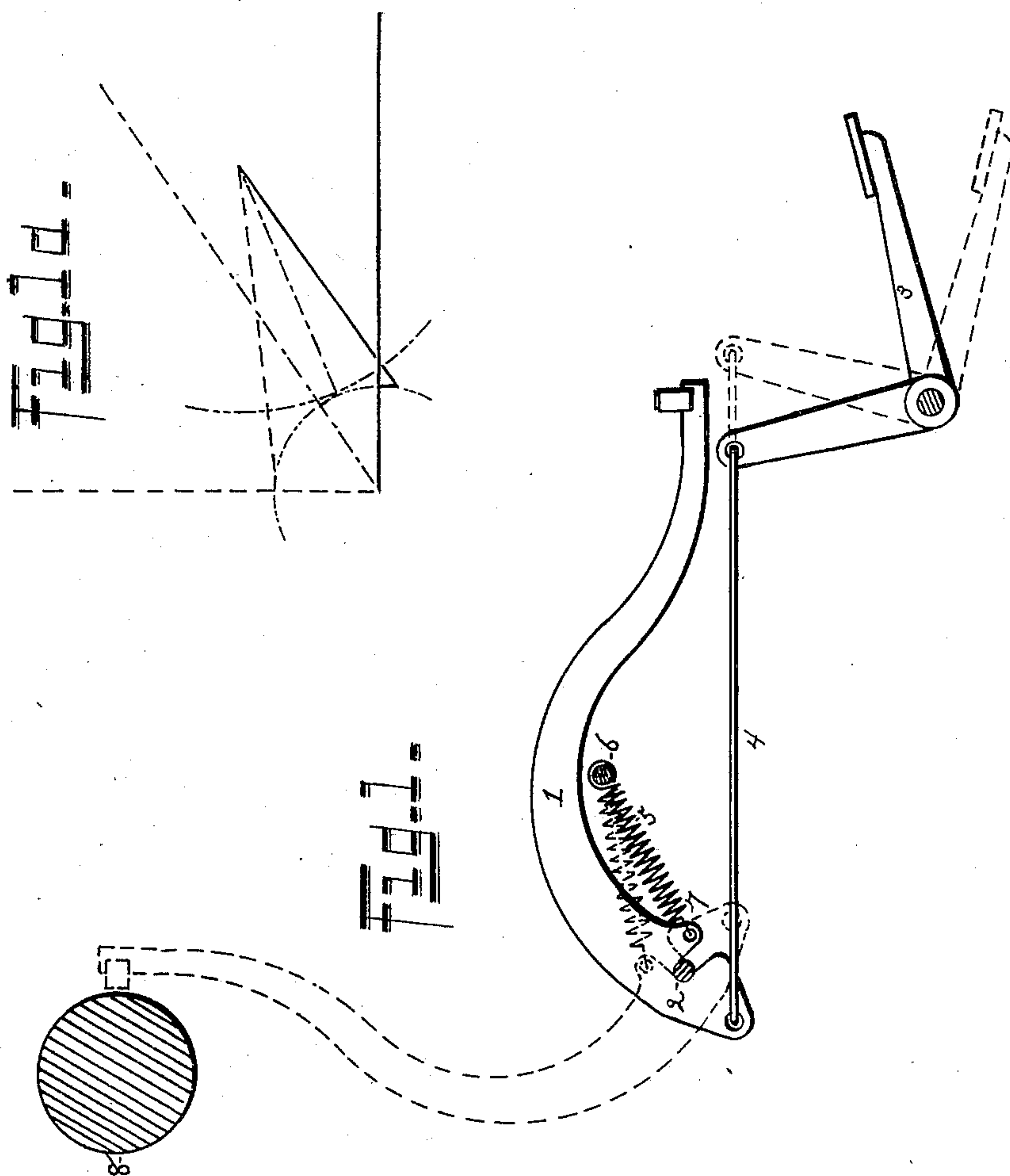
Patented Nov. 27, 1900.

L. S. BURRIDGE.
TYPE WRITING MACHINE.

(Application filed Aug. 1, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

Francis Herll.
Lee S. Burridge

INVENTOR

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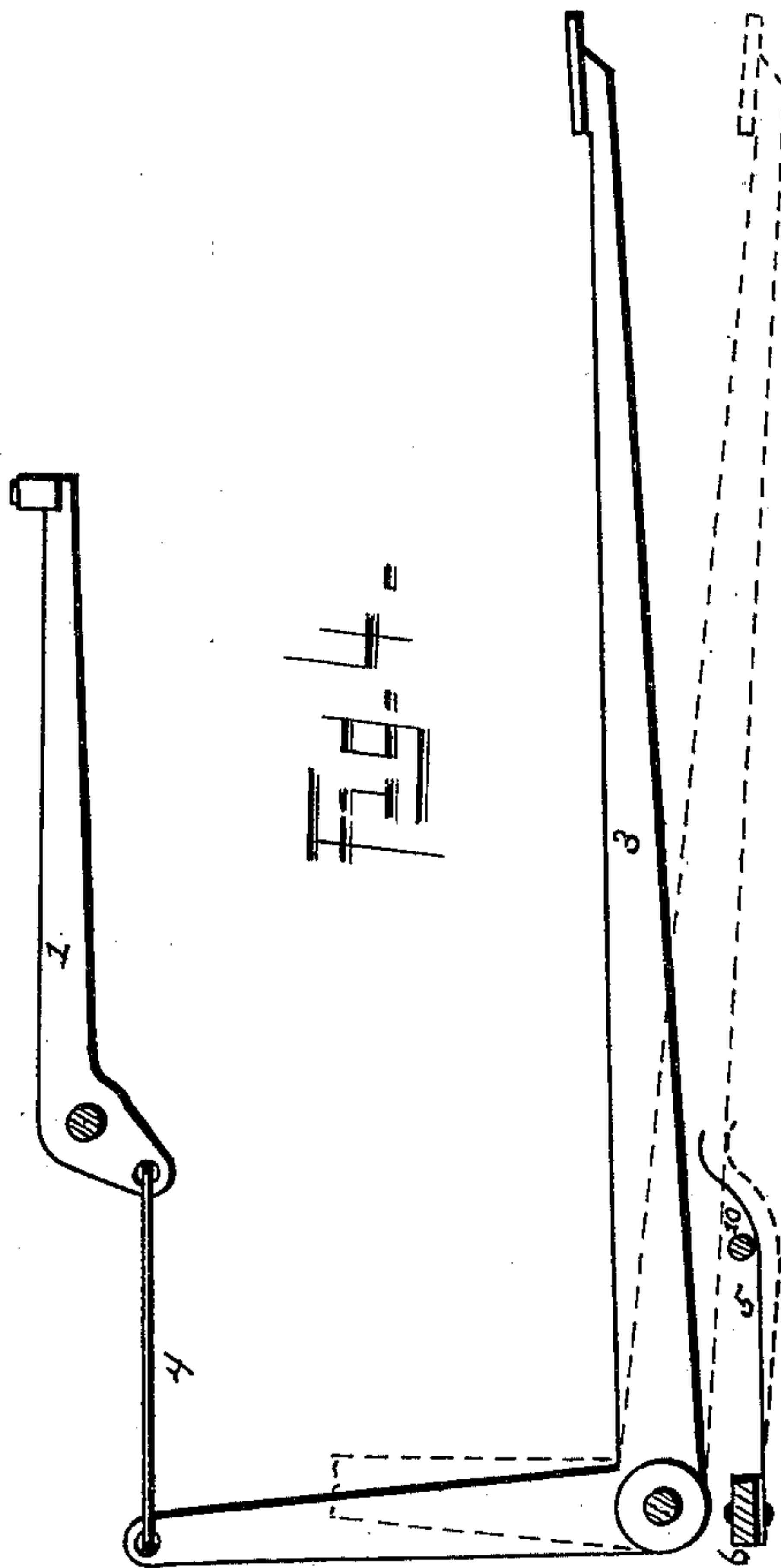
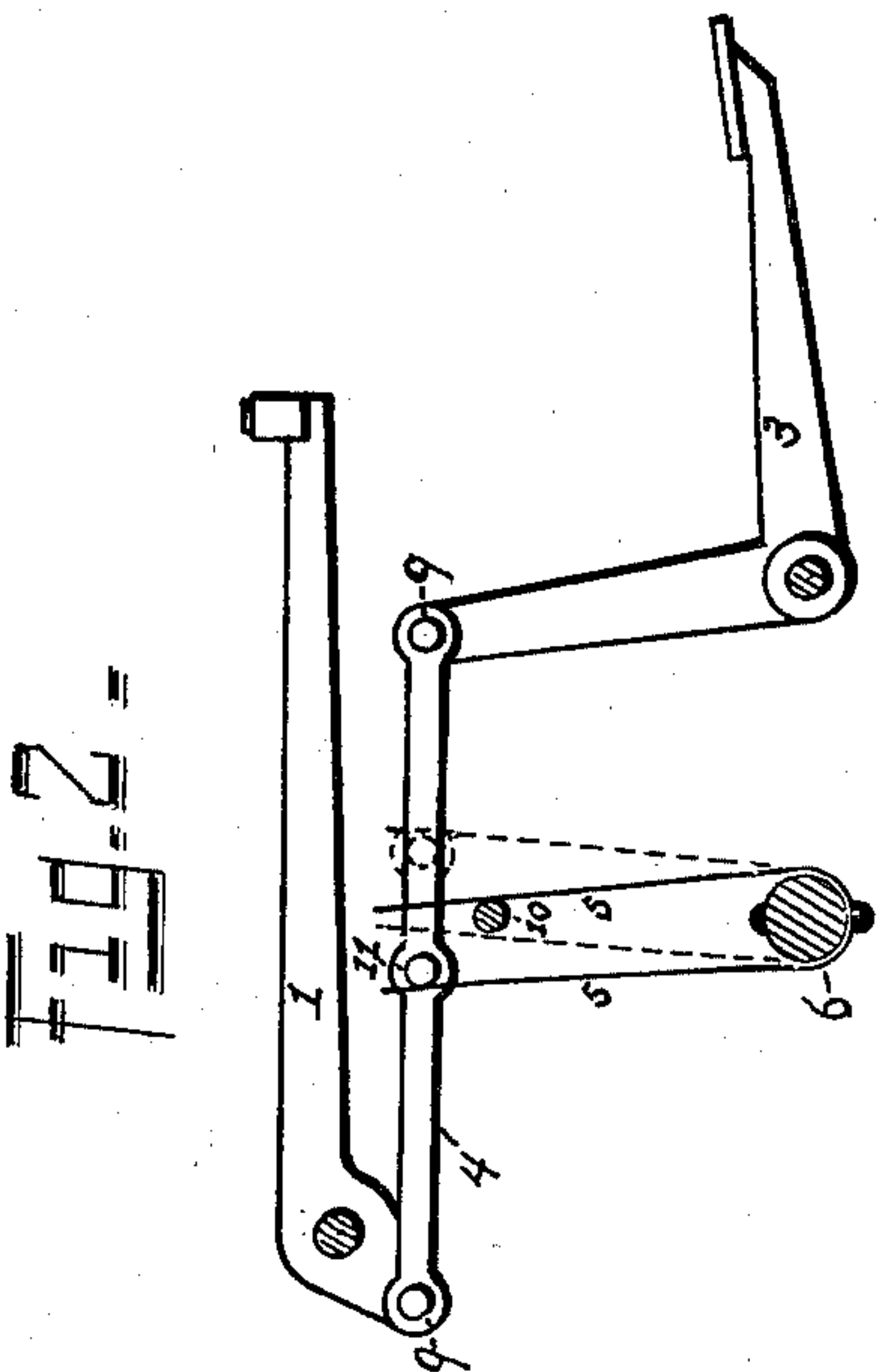
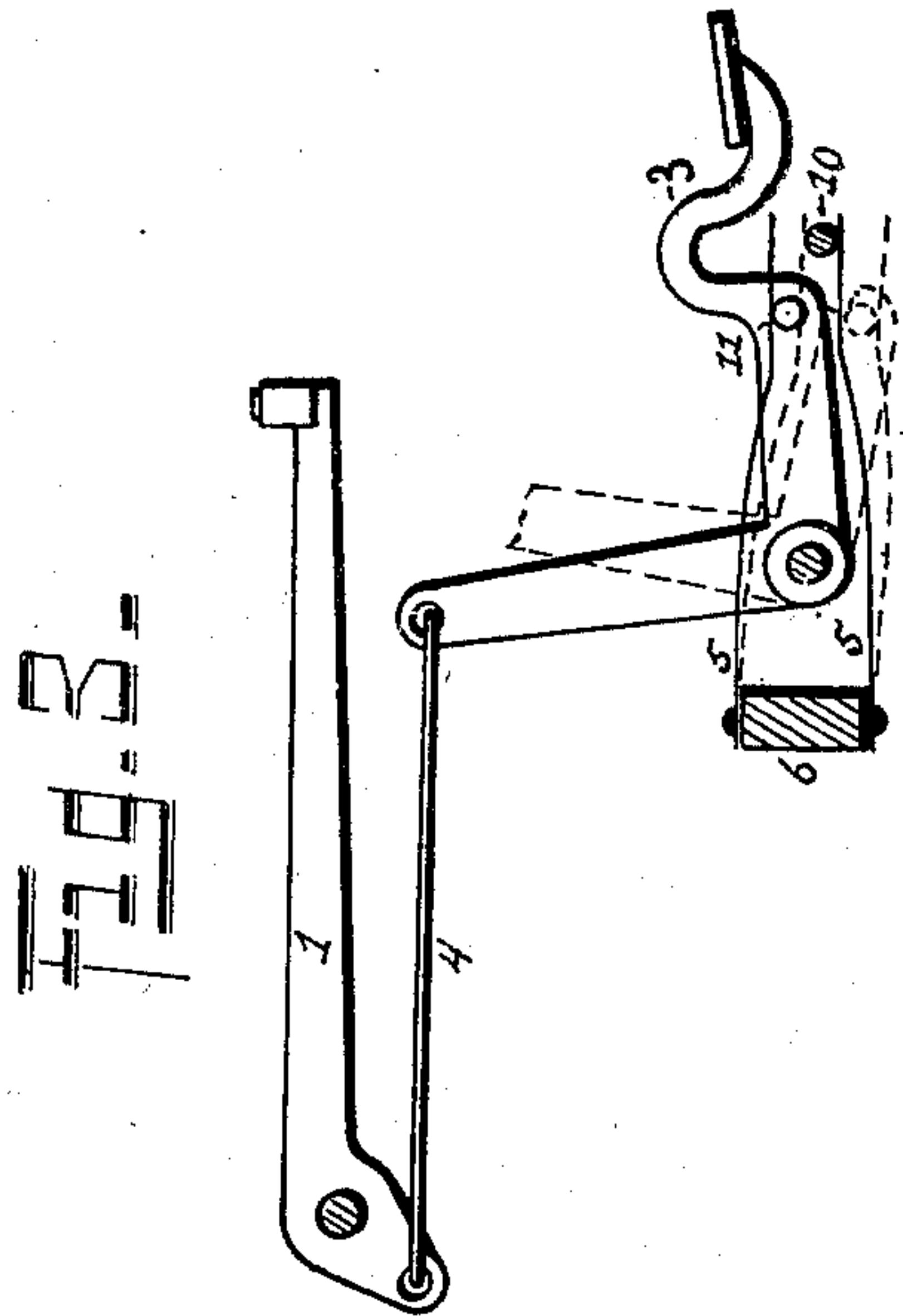
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UNITED STATES PATENT OFFICE.

LEE S. BURRIDGE, OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 662,393, dated November 27, 1900.

Application filed August 1, 1899. Serial No. 725,776. (No model.)

To all whom it may concern:

Be it known that I, LEE S. BURRIDGE, a citizen of the United States, residing at New York, borough of Manhattan, in the county and State of New York, have invented new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to type-writing machines in which type levers or bars are employed, and more particularly to that class in which such type-levers are arranged to strike on the front of the platen and normally lie in a practically horizontal position in a segment of a circle.

It is well known that the usual connecting mechanism between the key and the type-lever, such as is employed in the well-known "under-strike" machines, becomes heavy and disagreeable to the "touch" when applied to "front-strike" machines, for the reason that the type-levers lie normally in a practically horizontal position, and therefore the entire weight of the lever must be raised, whereas in under-strike machines the levers lie downward practically vertically and the weight of the lever is sustained by the fulcrum. To overcome this objection, the usual means has been intermediate mechanism that gives increased leverage to start raising the type-lever, the leverage becoming less as the lever gains momentum.

I attain the object by means of the mechanism illustrated in the accompanying drawings, which do not show a complete writing-machine, but only such parts as will clearly demonstrate my invention.

Figure 1 is a side elevation. Fig. 1^a is a diagram showing the lines of travel of the parts in Fig. 1. Figs. 2, 3, and 4 are side elevations of modifications of the mechanism shown in Fig. 1.

Referring to Fig. 1, the type-lever 1 is fulcrumed on the rod or wire 2 and is connected to the key-lever 3 by means of the ligament 4. The spring 5, secured at one end to the rod or wire 6, is hooked in a hole 7 of the type-lever.

8 is a section of the platen.

When the key-lever is depressed, the type-lever will be actuated until the type on the end of the lever comes in contact with the platen, as shown by dotted lines. It will read-

ily be seen that the spring acts on both sides of the center. When the type-lever is at rest, the spring tends to raise it, (and if strong enough such would be the result,) and when the lever is in printing position the spring tends to draw it down again. There is of course a point in the travel of the type-lever at which the spring has neither the effect to raise nor lower it, that point being when the spring is in a straight line with the fulcrum of the lever, as more clearly shown by the diagram Fig. 1^a. It is evident that the spring also tends at all times to hold the type-lever firmly on its seat or fulcrum.

Referring to Fig. 2, the type-lever 1 is connected to the key-lever 3 by means of the ligament 4, which in this instance is a strip of sheet metal connected to the two levers by means of pins or rivets 9. The spring 5 is bent so that the free ends bear toward each other and is fastened to the rod 6. The wire 10 arrests the ends of the spring from coming together, and the pin 11 is riveted to the ligament 4 to be acted upon by the ends of spring 5. The action of the spring 5 is similar to that shown in Fig. 1. When the type-lever is at rest, one end of the spring tends to raise it, while the other end of the spring bears against the wire 10 and is therefore idle. Now when the type-lever is actuated the one end of the spring in action will move over with the pin 11 until it is arrested from further action by the wire 10, and as the pin 11 continues the other end of the spring will be displaced. The position of pin 11 and the ends of spring 5 when the type-lever is raised is shown by dotted lines.

Referring to Fig. 3, the type-lever 1, key-lever 3, and ligament 4 are similar. The springs 5 5 are secured to a block 6 and bear toward each other and are arrested in their path of motion by the wire 10. The springs 5 5 act upon the key-lever by means of the pin 11, secured to the lever. The action is the same as that shown in Fig. 2. When the key end of the lever is up, one spring will tend to bear it down, while the other spring is idle against the wire 10, and when the key-lever is depressed the spring in action will become idle and the other will be displaced, as shown by dotted lines.

Referring now to Fig. 4, the type-lever 1

and ligament 4 are connected to the key-lever 3, which is much longer and consequently heavier than that shown in the other figures. The spring 5 is secured to block 6 and is arrested by the wire 10. In the normal position the spring 5 does not bear against the key-lever, and the depressed position is shown by dotted lines. As stated above, the key-lever is much longer and consequently heavier than that shown in the other figures. Since the depression of the key-lever raises the type-lever, it is evident that the gravity of the key-lever will balance the gravity of the type-lever, and if the key-lever were made heavy enough it would raise the type-lever without the action of the finger. The two levers in Fig. 4 are so balanced or poised that the minimum of pressure on the key will actuate them, and the spring is only useful to return the parts when the type-lever is practically vertical, because in that position its gravity is lost on the fulcrum and has no tendency to return to the point of rest.

I do not confine myself to any particular manner of applying the spring or springs, nor to the particular form or shape of the parts shown, nor to the number of type on each lever, as my invention is applicable to any mechanism known in the art.

It will be understood that the description herein of the type-levers as lying normally in a substantially horizontal position is intended to indicate that such type-levers when in a normal position are not materially supported upon or from their fulcrums. The construction herein described has its most effective action when the point of "strike" of the type lies substantially over the fixed fulcrum of the type-lever, so that when the type-lever is thrown up from the substantially horizontal normal position of rest it will pass to or slightly beyond a vertical position over the fulcrum. The spring described will co-act with the gravity of the type-lever in returning the type-lever to the point at which the spring becomes inactive and thence to the position of rest of the type-lever. The gravity of the type-lever will overcome the resistance of the spring.

Where in the claims I refer to "means for counterbalancing the weight of the type lever or levers at the point of rest," I intend to refer to and include by this term both the spring and gravity counterbalancing devices herein shown and described.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a type-writing machine, the combination of a type-lever operatively connected to a finger-key, with a spring adapted to draw the type-lever in one direction at its point of rest, and in the opposite direction when at the printing-point, substantially as shown and described.

2. In a type-writing machine, the combination of a type-lever operatively connected to

a finger-key, with spring mechanism constructed to actuate the type-lever in opposite directions at different points of its travel, substantially as shown and described.

3. In a type-writing machine, the combination of a type-lever pivoted on a fixed fulcrum and operatively connected to a finger-key, with a spring normally under tension and tending to actuate the type-lever toward the printing-point, substantially as shown and described.

4. In a type-writing machine, the combination of a substantially horizontal type-lever pivoted on a fixed fulcrum and intermediate mechanism connecting it to a finger-key, with a spring tending to balance the weight of the type-lever and intermediate mechanism at the normal point of rest, substantially as shown and described.

5. In a substantially "front-strike" type-writing machine, a type-lever connected to a key-lever and having substantially horizontal normal position, spring mechanism tending to return the two levers to the point of rest and constructed to become inactive at a point in the travel of said levers before they reach such point of rest, and means to counterbalance the weight of the type-lever at such point of rest, substantially as herein described.

6. In a type-writing machine, a type-lever connected to a key-lever in combination with spring mechanism constructed to act in one direction during a portion of the travel of the levers, and in the opposite direction during another portion of the travel, substantially as shown and described.

7. In a type-writing machine, the combination of a key-lever operatively connected to a "front-strike" type-lever, with a spring constructed to assist in depressing the key-lever when the key-lever is up, substantially as shown and described.

8. In a type-writing machine, the combination of a key-lever operatively connected to a type-lever, with spring mechanism constructed to assist in depressing the key-lever when the key-lever is up, and to assist in return of the key-lever when the key-lever is depressed, substantially as shown and described.

9. In a type-writing machine, the combination of a type-lever operatively connected to a finger-key, with a spring constructed to draw the type-lever in one direction at its point of rest and in the opposite direction when at the printing-point and also to hold the type-lever on its fulcrum substantially as shown and described.

10. In a type-writing machine having type-levers which are substantially horizontal in normal position, the combination of spring mechanism constructed to return the type-levers during only a portion of their travel from the printing-point, with type-levers so constructed that their gravity will return them the remaining portion of their travel to

a normal point of rest, and means to counterbalance the weight of the type-levers at such point of rest.

5 11. In a type-writing machine, a substantially horizontal type-lever constructed to print in a substantially vertical position, in combination with spring mechanism constructed to act in opposite directions during the travel of said type-lever.

10 12. In a type-writing machine a substantially "front-strike" type-lever substantially horizontal at its point of rest and having its fulcrum below the printing-point in combination with spring mechanism constructed to
15 become inactive during a portion of the travel of said type-lever, and means to counterbalance the weight of the type-lever at such point of rest.

20 13. In a type-writing machine having its type-levers arranged in substantially horizon-

tal position when at rest and adapted to be returned by gravity substantially from the printing-point to the normal position of rest, spring mechanism connected to such type-levers and arranged to become inactive at a 25 point in the travel of the type-levers, and means to counterbalance the weight of the type-lever at such point of rest.

14. In a type-writing machine having its type-levers arranged to be returned by grav- 30 ity substantially from the printing-point to the normal position of rest, spring mechanism connected to such type-levers and arranged to act in opposite directions during the travel of said type-levers.

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Witnesses:

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