

No. 775,830.

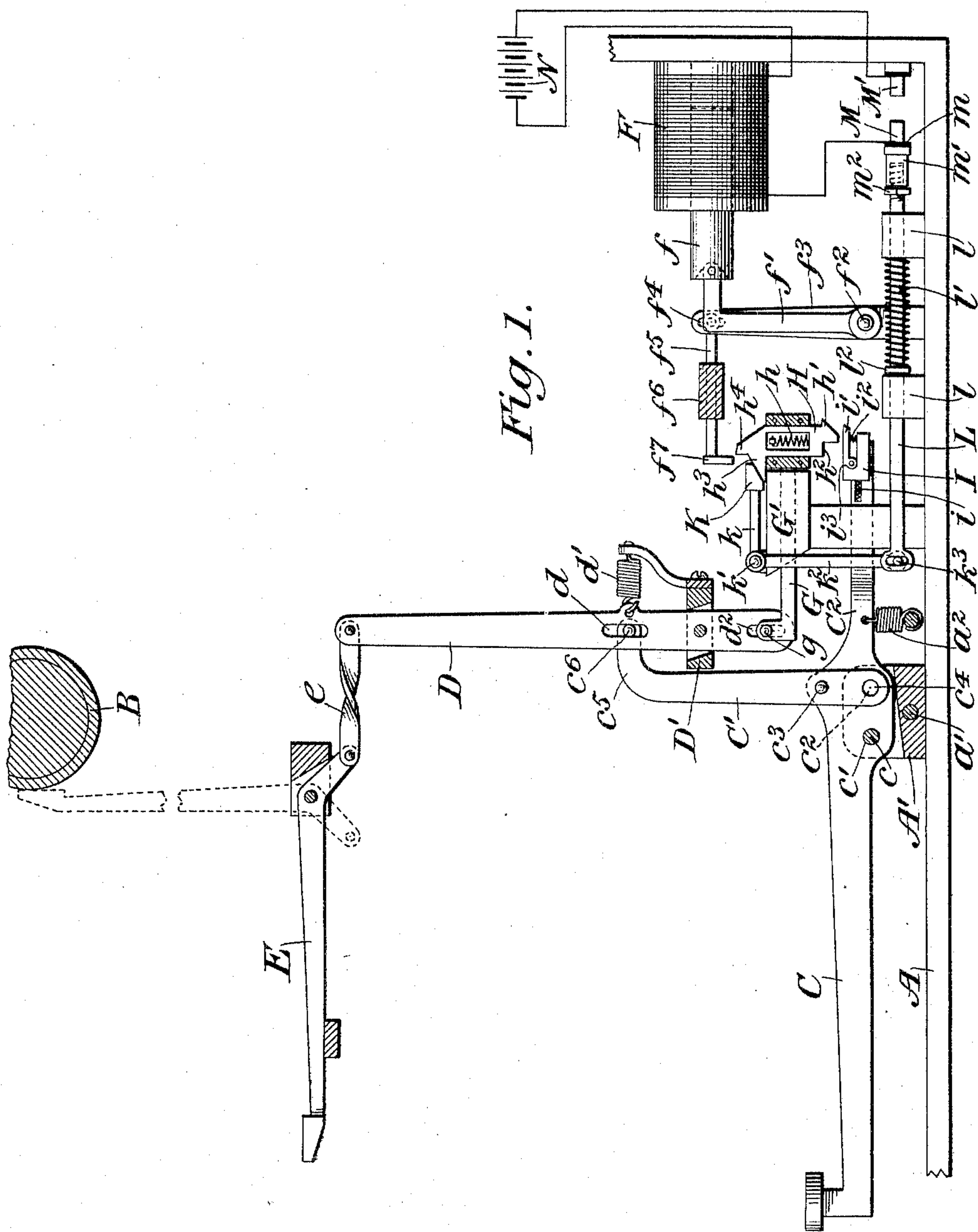
PATENTED NOV. 22, 1904.

G. M. KITZMILLER.
TYPE WRITING MACHINE.

APPLICATION FILED AUG. 4, 1904.

NO MODEL.

3 SHEETS—SHEET 1.



Attest:
A. N. Jesbera.
Charles A. Noone

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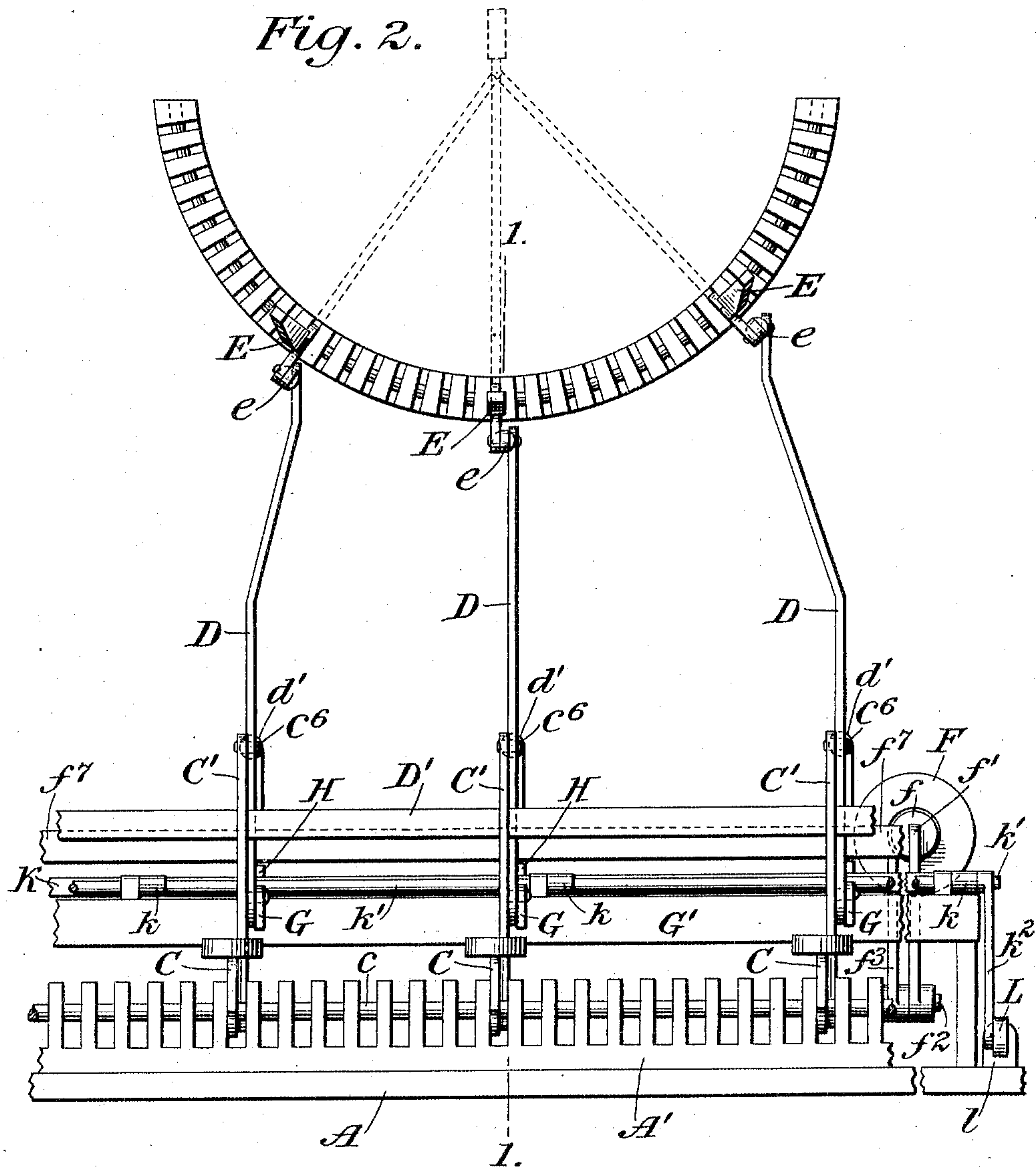
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3 SHEETS—SHEET 2.



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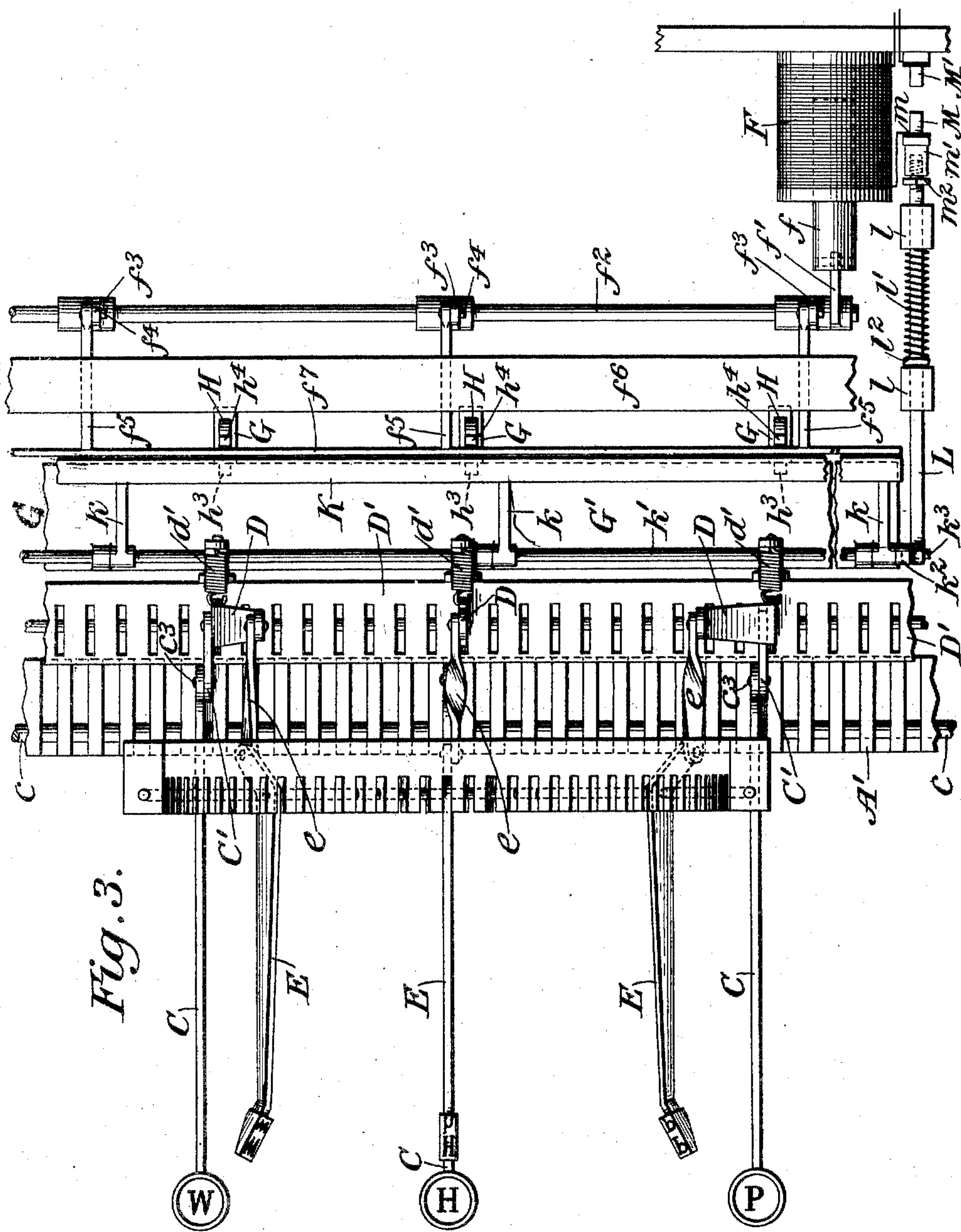


Fig. 3.

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UNITED STATES PATENT OFFICE.

GEORGE M. KITZMILLER, OF NORFOLK, VIRGINIA, ASSIGNOR TO ELECTRIC TYPEWRITER COMPANY OF NORFOLK, OF NORFOLK, VIRGINIA, A CORPORATION OF VIRGINIA.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 775,830, dated November 22, 1904.

Application filed August 4, 1904. Serial No. 219,448. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. KITZMILLER, a citizen of the United States, and a resident of Norfolk, in the State of Virginia, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

This invention relates generally to type-writing machines in which the type-bars are actuated by motive power other than that supplied by the fingers of the operator, although such motive power may be controlled and the selection of the type-bars determined by the operator.

One object of the invention is to provide comparatively simple mechanism whereby the type-bars may be actuated from the source of power and whereby the control of such source of power and the selection of the type-bars may be readily effected.

A further object of the invention is to make machines of the character referred to operable manually when desired without requiring the use of any other source of power.

Incidentally to these main objects of the invention it has also been sought to improve the construction and operation of such means in various particulars.

The several features of construction thus referred to, as well as the general features of the invention, will be fully explained hereinafter with reference to the accompanying drawings, in which, for purposes of explanation of the nature of the invention, it is illustrated as embodied in a convenient and practicable structure.

In the drawings, Figure 1 is a view mainly in transverse section on a plane passing through the center of the machine and indicated by the broken line 1 1 of Fig. 2, most of the working parts being shown in elevation and only such parts being represented as are particularly concerned with the invention. Fig. 2 is a partial front view of the machine, only three of the key-levers and their connections being represented. Fig. 3 is a partial

plan view of so much of the machine as is represented in Figs. 1 and 2.

In another application, Serial No. 190,376, filed January 23, 1904, there is described and claimed a particular embodiment of the present invention, and, as some of the details of construction herein referred to are also common to that application and are described and explained therein, reference may be had to said application for explanation of some of the features of construction which will be more briefly and generally referred to herein. As in the machine shown in said application, so in the machine chosen for illustration herein of the main features of the broader invention, the source of power relied upon for the actuation of the type-bars is electromagnetic in its nature, a solenoid being illustrated in the present case as the source of power most readily lending itself to the purposes of the invention.

Referring now to the construction illustrated in the accompanying drawings, it will be seen that a portion of the frame of a type-writing machine sufficient to illustrate the support of the devices with which the invention is particularly concerned is represented at A and the platen with which the type-bars cooperate is represented at B, the position of the latter being indicated as somewhat lower than it would be in the actual machine in order to save space in the drawings. The key-levers C, which may have any suitable form, are mounted in a slotted block or fulcrum-support A', being fulcrumed conveniently upon a wire or rod *c*, common to all of the key-levers of the series. Each key-lever is provided with two holes *c'* and *c''*, respectively, for engagement with the rod *c*, the hole *c'* serving as a fulcrum when the machine is actuated by the solenoid or other source of power and the hole *c''* serving as the fulcrum when the machine is to be manually operated. For convenience a hole *a'* may be provided in the block A' to receive a rod *c* for the support of the key-levers when the fulcrum-rod *c* is being shifted from one fulcrum-hole to another.

For convenience in description that portion

of the mechanism which is in use when the machine is being operated manually will be first explained. Upon each key-lever C is pivoted, as at c^3 , a second lever C', which has below its pivot c^3 a hole c^4 , to be engaged by the fulcrum-rod c when the machine is manually operated, so that the secondary lever C' is then rigidly secured to and, in effect, forms a rigid arm of the key-lever C. At its upper end the lever C' may be bent backwardly, as at c^5 , and provided with a pin or stud, as at c^6 , to engage a slot d in the corresponding type-lever D. The several type-levers D of the series are suitably formed, as indicated in Fig. 2, according to their position in the series, each one from the center being bent more or less in one direction or the other, according to its position, to bring its upper end into proper relation with respect to the corresponding type-bar E and to conform to the radius of the semicircle in which such type-bars are fulcrumed. Each type-bar lever D is connected to its corresponding type-bar E by a link e , which is twisted upon itself more or less, so that one end of the link may be always in a vertical plane corresponding to the plane of the type-lever, while the plane of the other end may be varied to accommodate itself to the plane of the corresponding type-bar. The several type-bar levers D are fulcrumed in a fixed bar D', each type-bar lever being provided with a suitable tension-spring d' , as more fully explained in said application Serial No. 190,376.

For the actuation of the type-bars by means other than the hands of the operator there is provided a single source of power, such as the solenoid F, for the entire series of type-bars, each of said type-bars being brought into operative relation with such actuating means by devices under the control of the operator, while at the same time the circuit through the solenoid is closed. As clearly shown in Fig. 1, each type-bar lever D is extended below its fulcrum and is slotted, as at d^2 , for engagement with a pin or stud g , carried by a plunger G, such plunger being preferably bent upward or provided with vertical arms to bring the line of pull upon the type-bar lever into the plane of the application of power to the plunger, as hereinafter described. Each plunger is mounted for reciprocation in a horizontal direction in a suitable guide G' and is provided at its head end with a vertically-movable latch H, which is restored to its normal position after being lifted, as hereinafter described, by a compression-spring h , arranged as more fully described in said application Serial No. 190,376. The latch is also provided with a shoulder h' to prevent it from being lifted too far through the plunger-head and with a shoulder h^2 to engage the lifter for a purpose to be explained hereinafter. Above the plunger-head the latch is provided with a finger h^3 for coöperation with the circuit-clos-

ing devices and also with a lip h^4 for engagement with a hook, by means of which the plunger is drawn backward to actuate the type-bar through the connections already described.

For the purpose of lifting the latch each key-lever C is extended rearwardly, as at C², beyond its fulcrum and at a point beneath the corresponding latch is provided with a sliding block I, which is held normally in its extreme rearward position by a light compression-spring i . The sliding-block is provided with a pivoted tongue i' , swinging downward only against a rather stiff compression-spring i^2 and held from swinging above its normal horizontal position by a shoulder i^3 . It will now be understood that when the key is depressed and the rear end of the key-lever is elevated against the tension of the spring a^2 the tongue i' will lift the latch H and that as the latch is lifted to its limit the tongue i' will be depressed against the spring i^2 , thereby permitting the latch to slide off from the tongue the more easily when the plunger is drawn back, as hereinafter explained. Furthermore, should the key still be held down after the plunger is released and when it moves forward the end of the latch will strike the end of the tongue i' and will cause the block I to slide forward against the tension of the comparatively weak spring i . The offset h^2 of the latch H under these conditions reduces the amount of movement which the sliding block I would otherwise have.

The fingers h^3 of the several latches H, carried by the several plungers G, underlie the universal bar K, which extends across the entire series. The bar K is carried by arms k , extended from a shaft k' , mounted to oscillate in suitable bearings, said shaft being also provided at one end with a depending arm k^2 , which has a pin-and-slot connection, as at k^3 , with a plunger-rod L, which is mounted to slide in suitable bearings l , being normally held in its forward position by a light compression-spring l' , while a collar l^2 on the rod coöperates with one of the bearings l to prevent too great forward movement of the plunger-rod. The rod L carries, preferably at its rear end, a contact M, which is insulated from the rod, as indicated at m , and is preferably adjustable thereon, for which purpose its sleeve m' may be threaded upon the end of the rod L, while a lock-nut m^3 is provided to retain it in adjusted position. A second contact, M', is suitably mounted upon a frame of the machine, also insulated therefrom, and the two contacts M and M' form the terminals of a normally open electric circuit, which includes a battery N or other source of supply, and the solenoid F. The core f of the solenoid is pivotally connected to an arm f' , extended upwardly from a shaft f^2 , mounted to oscillate in suitable bearings. The shaft f^2 is also provided near its end with arms f^3 ,

which have a pin-and-slot connection, as at f^4 , with rods f^5 , which are mounted in suitable guide-sleeves f^6 and carry at their forward ends a universal hook-bar f^7 , common to all of the latches H of the entire series of plungers G. It will now be understood that when the latch H of any plunger G is lifted, as before described, the finger h^3 of such latch lifts the universal bar K, which, through the described connection with the plunger L, closes the circuit of the solenoid at M M', thus causing the solenoid to be energized. At the same time the lip h^4 of the latch is lifted into the path of the hook-bar f^7 , so that as the core f of the solenoid F is drawn back the hook-bar also will be drawn back and will draw back with it the corresponding plunger. This movement of the plunger through the described connection with the type-bar lever D will cause the type-bar to carry its type against the paper on the platen. As the plunger is drawn back the latch H is also drawn back and its finger h^3 is withdrawn from beneath the universal bar K, whereby the latter is permitted to fall to its normal position and the plunger-rod L to be restored to its normal position, thereby instantly breaking at M M' the circuit of the solenoid and permitting all parts to be restored to their normal positions by the tension of the spring g' . The beveling of the fingers h^3 and of the universal bar K permits the return movement of the plunger and the latch without danger of its being prevented by the striking of the finger against the rear side of the universal bar.

The operation of the machine has already been described sufficiently and requires no further explanation herein. It will be obvious, moreover, that various changes in details of construction and arrangement of parts may be made without departing from the spirit of the invention, one of such different arrangements being described at length and claimed in the application before referred to.

I claim as my invention—

1. In a type-writing machine, the combination of a platen, a printing device, a key-lever, a source of power, operative connections between said source of power and said printing device controlled by said key-lever, said key-lever being otherwise independent of said source of power and of said operative connections and mechanically disconnected from the printing device and connections between said key-lever and said printing device whereby said printing device may be actuated directly by said key-lever, substantially as described.

2. In a type-writing machine, the combination of a platen, a printing device, a key-lever, a direct connection between said key-lever and said printing device and means to couple the same to the key-lever, a source of power, operative connections between said source of power and said printing device normally disconnected, and means controlled by

said key-lever to engage said connections, said key-lever being otherwise independent of said source of power and of said operative connections and mechanically disconnected from the printing device, substantially as described.

3. In a type-writing machine, the combination of a platen, a printing device, a key-lever having two fulcra, a normally inoperative connection between said key-lever and said printing device, means to couple said connection when the key-lever is mounted upon one fulcrum for manual printing, a source of power, normally inoperative connections between said source of power and said printing device, and means to couple said connections when the key-lever is mounted upon the other fulcrum through the operation of the key-lever, substantially as described.

4. In a type-writing machine, the combination of a platen, a printing device, a key-lever, an electromagnetic device included in a normally open circuit, means controlled by the key-lever to close said circuit, operative connections between said electromagnetic device and said printing device, said key-lever being otherwise independent of said electromagnetic device and of said operative connections and mechanically disconnected from the printing device and connections between said key-lever and printing device, whereby said printing device may be actuated directly by said key-lever, substantially as described.

5. In a type-writing machine, the combination of a platen, a printing device, an electromagnetic device included in a normally open circuit, means controlled by the key-lever to close said circuit, means controlled by the key-lever to establish operative mechanical connections between said electromagnetic device and the printing device, said key-lever being otherwise independent of said electromagnetic device and of said operative connections and mechanically disconnected from the printing device and connections between said key-lever and said printing device whereby said printing device may be actuated directly by said key-lever, substantially as described.

6. In a type-writing machine, the combination of a platen, a printing device, a key-lever, a secondary lever pivoted upon said key-lever and operatively connected to said printing device, and means to couple said secondary lever to said key-lever, whereby the printing device may be actuated directly by said key-lever, substantially as described.

7. In a type-writing machine, the combination of a platen, a printing device, a key-lever having two fulcra, a secondary lever pivoted upon said key-lever and operatively connected to said printing device, and a fulcrum-rod to engage one of said fulcra, leaving the secondary lever free, or to engage the other of said fulcra and the secondary lever to couple the same to the key-lever, substantially as described.

8. In a type-writing machine, the combination of a platen, a type-bar, a type-bar lever connected therewith, a key-lever, a secondary lever pivoted upon said key-lever, and engaging said type-bar lever, and means to couple said secondary lever to said key-lever, substantially as described.

9. In a type-writing machine, the combination of a platen, a printing device, a key-lever, a source of power, a hook-bar connected to said source of power, a plunger operatively connected to the printing device, and a latch carried by said plunger and moved by said key-lever into the path of said hook-bar, substantially as described.

10. In a type-writing machine, the combination of a platen, a printing device, a key-lever, an electromagnetic device, a hook-bar actuated by said electromagnetic device, a plunger operatively connected to the printing device, a latch carried by said plunger and moved by said key-lever into the path of said hook-bar, and means actuated by said latch to close the normally open circuit of said electromagnetic device, substantially as described.

11. In a type-writing machine, the combination of a platen, a printing device, a key-lever, an electromagnetic device, a hook-bar actuated by said electromagnetic device, a plunger operatively connected to the printing device, a latch carried by said plunger and moved by said key-lever into the path of said hook-bar, a bar overlying a projection from said latch, and means operated by said bar to close the normally open circuit of said electromagnetic device, substantially as described.

12. In a type-writing machine, the combination of a platen, a printing device, a key-lever, an electromagnetic device, a hook-bar actuated by said electromagnetic device, a plunger operatively connected with the printing device, a latch carried by said plunger and moved by said key-lever into the path of said hook-bar, a plunger-rod adapted to make and break the circuit of said electromagnetic device, a bar overlying a projection from said latch, and connections between said bar and said plunger-rod, whereby as the latch is moved into the path of the hook-bar the normally open circuit of the electromagnetic device is closed, substantially as described.

13. In a type-writing machine, the combination of a platen, a printing device, a key-lever, an electromagnetic device, a hook-bar actuated by said electromagnetic device, a plunger operatively connected with the printing device, a latch carried by said plunger, and moved by said key-lever into the path of said hook-bar, a plunger-rod, an electrical contact mounted adjustably upon said plunger-rod and adapted to make and break the circuit of the electromagnetic device, a bar overlapping a

projection from said latch, and connections between said bar and said plunger-rod, whereby as the latch is moved into the path of the hook-bar the normally open circuit of the electromagnetic device, is closed, substantially as described.

14. In a type-writing machine, the combination of a platen, a printing device, a key-lever, an electromagnetic device, a shaft, an arm on said shaft connected to said electromagnetic device, a hook-bar having guide-arms, arms on said shaft engaging said guide-arms, a plunger operatively connected with the printing device, a latch carried by said plunger and moved by said key-lever into the path of said hook-bar, and means actuated by said latch to close the circuit of said electromagnetic device, substantially as described.

15. In a type-writing machine, the combination of a platen, a printing device, a key-lever, an electromagnetic device, a hook-bar actuated by said electromagnetic device, a plunger operatively connected with the printing device, a latch carried by said plunger and moved by said key-lever into the path of said hook-bar, an oscillating shaft, a bar carried by arms from said shaft and overlying a projection from said latch, an arm dependent from said shaft, and a plunger-rod connected to said arm and adapted to make and break the circuit of said electromagnetic device, substantially as described.

16. In a type-writing machine, the combination of a platen, a printing device, a key-lever, a source of power, operative connections between said source of power and said printing device controlled by said key-lever, an arm upon said key-lever, means for connecting said arm to said printing device, and means for changing the location of the fulcrum of the key-lever, whereby the printing device may be actuated directly by the key-lever through said arm or from said source of power, substantially as described.

17. In a type-writing machine, the combination of a platen, a type-bar, a type-bar lever connected therewith, a key-lever, a source of power, operative connections between said source of power and said type-bar lever controlled by said key-lever, an arm on said key-lever for operating the said type-bar lever, and means for changing the point of fulcrum of the key-lever, whereby the type-bar may be actuated directly by the key-lever through said arm or from said source of power, substantially as described.

This specification signed and witnessed this 22d day of July, A. D. 1904.

GEO. M. KITZMILLER.

In presence of—

ANTHONY N. JESBERA,
WILLIAM B. GREELEY.