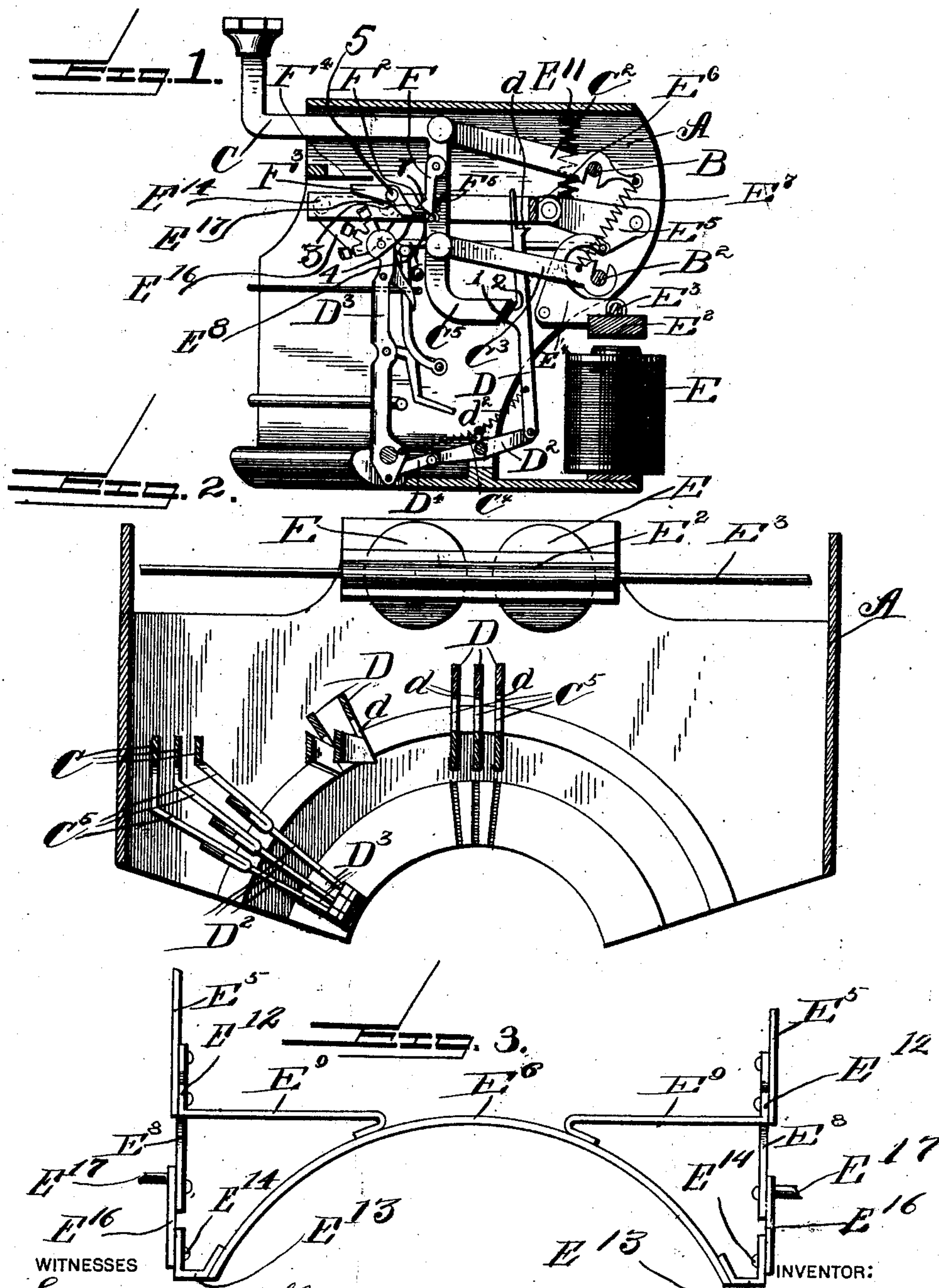


No. 840,121.

PATENTED JAN. 1, 1907.

G. W. DONNING.  
ELECTRICAL TYPE WRITER.  
APPLICATION FILED MAY 27, 1903.



**WITNESSES**

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# UNITED STATES PATENT OFFICE.

GEORGE W. DONNING, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO  
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## ELECTRICAL TYPE-WRITER.

No. 840,121.

Specification of Letters Patent.

Patented Jan. 1, 1907.

Application filed May 27, 1903. Serial No. 158,964.

*To all whom it may concern:*

Be it known that I, GEORGE W. DONNING, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Electrical Type-Writers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to provide means for operating the type-bars in a type-writer, wherein the movable carriage carries both the writing mechanism and the key-bar, means for operating the type-bars from a common source of power, while the selecting means are operated by the usual form of key-levers.

Another object is to provide in a type-writer an improved form of means for operating all of the key-bars from a common power-bar, while the selecting means is operated by the key-levers.

With these objects in view and others my invention comprehends the construction, arrangement, and combination of parts as hereinafter set forth, and then pointed out in the claims.

In the drawings representing an apparatus embodying my invention, Figure 1 is a sectional elevation, and Fig. 2 is a horizontal section, certain parts being omitted for the sake of clearness, and Fig. 3 shows the power-bar and supports.

Referring now to the views, in which the characters of reference indicate the same parts, between the side members of the frame A are supported two rods B B<sup>2</sup>. A set of key-levers C are each suspended by a pair of links C<sup>2</sup> C<sup>3</sup>. A retractile spring E<sup>7</sup> serves to retain the links and key-lever in their normal operative position. The links C<sup>2</sup> C<sup>3</sup> and retractile spring E<sup>7</sup> together normally sustain the key-lever in position; but when said lever is depressed the type-bar is actuated, placing the spring E<sup>7</sup> under tension, and this will then, after the type-bar has reached the printing-point, serve by acting on the links C<sup>2</sup> C<sup>3</sup> to return the same to normal position, and this independent of the operation of any of the parts hereinafter described.

An upright lever D is pivoted to a sub-lever D<sup>2</sup>, whose other end is connected with

the type-bars D<sup>3</sup> by link D<sup>4</sup>. There are a series of levers, type-bars, and connecting parts that are arranged radially, as shown in Fig. 2.

At the rear of the machine is an electromagnet E, having an armature E<sup>2</sup>, pivoted on a rod E<sup>3</sup>, whose ends are supported by a pair of levers E<sup>4</sup> E<sup>4</sup>, pivoted to the sides of the casing. Another pair of levers E<sup>5</sup> E<sup>5</sup> are pivoted to the casing and carry between them a power-bar E<sup>6</sup>. The levers E<sup>4</sup> are each pivoted to one of the levers E<sup>5</sup>, and a retractile spring E<sup>11</sup> serves to retain the power-bar, armature, and connected parts in their normal upper position; but when the electromagnet is energized and attracts the armature E<sup>2</sup> the power-bar will be moved downward.

The upper portion of each of the levers D has a foot d, projecting toward the power-bar, but normally retained out of the path of movement of the power-bar by a retractile spring d<sup>2</sup>. The key-levers each have an arm C<sup>5</sup>, having a cam-face 1 that when the lever is depressed will strike a similar face 2 on one of the upright levers D, and thereby force the latter lever toward the power-bar and bring its foot d into the path of movement of the power-bar. Upon the electromagnet being energized, when a key shall have brought an operating-lever D into this said position, the lowering of the power-bar will move the lever D endwise downward, which latter movement through the sublever and connecting-link will serve to rock the type-bar, it being understood that there is an appropriate operating-lever and type-bar for each key-bar. Upon release of these parts they will be returned to their normal positions, the type-bar and connected parts being returned by a coiled spring C<sup>4</sup>.

In order to cause the magnet operating the power-bar to be energized by the depression of the key after the key shall have rocked the operating-lever D into position to be engaged by the power-bar, I provide each key-lever C with a pivoted detent F, having at its lower free end a beveled foot F<sup>2</sup> and a lug or projection 3. Arranged in the path of movement of each detent is a lever F<sup>3</sup>, one end of which is provided with a beak or projection 4, which is designed to be engaged by the projection on the detent F, and thereby be rocked on its pivot 5 to throw its opposite



extremity upward and into engagement with a spring terminal member  $F^4$ , which forms one terminal of a circuit, including a battery or other source of power and the electromagnet E. The levers  $F^3$  are all suitably connected with the other terminals of said circuit. Therefore when any of said levers  $F^3$  are rocked the magnet will be energized.

It is to be understood that the lower ends of the detents F are so arranged relative to the beak or projection 4 on the levers  $F^3$  that during the initial depression of the key-levers C said detent will not immediately engage and rock the lever to complete the circuit, but such engagement and rocking will occur only when the cam-face 1 of arm  $C^5$  shall have engaged sufficiently with the cam-face 2 on the lever D to have brought the lever D into a position of engagement with the power-bar. Then the further movement of the key-lever, after having rocked the operating-lever D, will cause the detent F to be carried further down and by reason of the formation of a cam-face 6 between the beveled foot  $E^2$  and the lug 3 on the detent the beak 4 on the lever will be caused to ride along said cam-face 6 and effect a slight further rocking of the lever  $F^3$ , (which is permitted by the resiliency of the terminal member  $F^4$ .) Then the lug 3 on the detent will have passed over the end of beak 4 and the lever is then allowed to disengage from the terminal  $F^4$  and return to its normal position, thereby breaking the circuit, and deenergize the power-bar magnet. A spring  $F^6$  is disposed to the rear of the detent and tends to maintain it in normal position. During the return movement of the key-lever to normal position the beveled upper edge 7 of the lug 3 will permit the detent to latch by the beak 4 without rocking the lever  $F^3$ , so that the circuit will not again be closed to energize the magnet during the return stroke of the key-lever.

The universal power-bar  $E^9$  is preferably constructed in the form of a segment, so as to be in operative relation to the type-bars mounted as shown. At the rear it is conveniently provided with oppositely-directed rigid arms  $E^9$ , which extend parallel with the front of the laterally-traveling carriage A and may project somewhat beyond the ends of the power-bar arc. The outer ends of these arms are shown as being bent at right angles, as at  $E^{12}$ , and to these angled portions are pivoted the levers  $E^5$ . The ends of the power-bar may be provided with angled extensions  $E^{13}$ , to which are pivoted at  $E^{14}$  a pair of supplementary levers  $E^{16}$ , these latter being pivoted in turn at  $E^{17}$  to the casing. Connecting members  $E^8$  are pivoted at their ends to the levers  $E^5$  and  $E^{16}$ , insuring the simultaneous movement of these elements. The levers  $E^5$  and  $E^{16}$  thus constitute a parallel link mechanism, by means of which the tilting of the power-bar is avoided.

The electromagnet may be connected with a stationary source of electricity, such as a battery, by a flexible cable that may pass over a roll at the rear of the machine and then be connected with the said source underneath the base, sufficient slack in the cable being provided to allow for necessary longitudinal and transverse shifting of the movable carriage.

Without limiting myself to the construction and arrangement hereinbefore set forth, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a set of downwardly-acting type-bars, operating-levers connected therewith, key-levers disposed adjacent thereto, coinciding abutting faces arranged on said operating and key levers for positioning the operating-levers in operative position, during movement of the key-levers, an operating-bar disposed to impinge upon said operating-levers, to depress the same when positioned, an electromagnet for actuating said operating-bar, and means operated by the further movement of the key-levers for establishing a circuit through the electromagnet to energize the same, and, by still further movement of said key-levers, for effecting a discontinuance of said circuit, and means for returning the operating-bar to operative position.

2. The combination with a set of downwardly-acting type-bars, operating-levers connected therewith, key-levers disposed adjacent thereto, coinciding abutting faces arranged on said operating and key levers for positioning the operating-levers in operative position, during movement of the key-levers, an operating-bar disposed to impinge upon said operating-levers, to depress the same when positioned, an electromagnet for actuating said operating-bar, and means operated by the further movement of the key-levers for establishing a circuit through the electromagnet to energize the same, and, by still further movement of said key-levers, for effecting a discontinuance of said circuit, and spring-actuated means for returning the operating-bar to operative position.

3. The combination with a set of downwardly-acting type-bars, operating-levers connected therewith, key-levers disposed adjacent thereto, coinciding abutting faces arranged on said operating and key levers for positioning the operating-levers in operative position, during movement of the key-levers, an operating-bar disposed to impinge upon said operating-levers, to depress the same when positioned, an electromagnet for actuating said operating-bar, and means operated by the further movement of the key-levers for establishing a circuit through the electromagnet to energize the same, and, by still further movement of said key-levers, for effecting a discontinuance of said circuit, and



means for effecting return of the operating-bar to normal position, substantially as described.

4. The combination with a set of type-bars and an individual selecting device for each of said type-bars, of a power-bar for operating all of said type-bars, and an electromagnet for actuating said power-bar; said selecting device comprising an operating-lever and a key-lever movable, first, and, in succession, to position the operating-levers into the path of actuation of the power-bar and, then, by continued movement to effect energizing of said electromagnet for actuation of said power-bar, and, finally, by further movement, to effect deenergizing of the said electromagnet to permit return of said power-bar; an abutting face disposed on said operating-lever, an arm on said key-lever juxtapositioned to said abutting face of the operating-lever, means for effecting impingement of said arm against the abutting face to position said operating-lever, a spring-actuated detent carried by the key-lever, and a rocker-lever disposed independent of the key-lever and, during movement of the key-lever, cooperating with the detent for effecting energizing of the electromagnet to actuate the power-bar, substantially as described.

5. The combination of a set of type-bars, a set of operating-levers each connected with one of said type-bars and arranged to operate one of the same when moved endwise, a stop on each of said levers, a power-bar, a cam-lug on each of said levers, a set of key-levers corresponding to said levers, an arm on each of the key-levers arranged to engage a cam-lug on one of the said operating-levers, and thereby rock the lever and bring its stop into position to engage the said power-bar, and means on the key-levers to operate said power-bar, substantially as described.

6. The combination of a set of type-bars, a set of operating-levers each connected with one of said type-bars and arranged to operate one of the same when moved endwise, a stop on each of said levers, cam-lug on each of said levers, a power-bar, a set of key-levers corresponding to but independent of the operating-levers, an arm on each of the key-levers arranged, during one part of movement of the key-levers to engage the cam-lug on one of said operating-levers and thereby rock the lever and bring its stop into position to engage the said power-bar, an electromagnet arranged to operate the power-bar, and a circuit-closer arranged to be operated by the key-lever upon the further movement of the same, after having rocked the operating-lever, and thereby cause the said magnet to be energized and move the power-bar, substantially as described.

7. The combination of a set of type-bars, a set of operating-levers each connected with one of said type-bars and arranged to operate

one of the same when moved endwise, a stop on each of said levers, a cam-lug on each of said levers, a power-bar, a set of key-levers corresponding to the operating-levers, an arm on each of the key-levers arranged, during the first part of movement of the key-levers, to engage a cam-lug on one of said operating-levers and thereby rock the lever and bring its stop into position to engage said power-bar, an electromagnet arranged to operate the power-bar, and a circuit-closer arranged to be operated by the key-lever upon a continued movement of the same after having rocked the said operating-lever and thereby cause the said magnet to be energized and move the power-bar, said circuit-closer being arranged to be released upon a further movement of the key-bar, and also arranged not to be operated further upon the return movement of the key-bar, substantially as described.

8. The combination of a set of type-bars, a set of operating-levers, a pair of links pivoted to each of the operating-levers, a pair of shafts upon which said links are pivoted, a set of operating-levers each connected with one of said type-bars and arranged to operate one of the same when moved endwise, a stop on each of said levers, a power-bar, a cam-lug on each of said levers, a set of key-levers corresponding to said levers, an arm on each of the key-levers arranged, during the first part of movement of the key-levers, to engage a cam-lug on one of the said operating-levers, and thereby rock the lever and bring its stop into position to engage the said power-bar, and means on the key-levers arranged to cause a further movement after rocking said cam-lever to operate said power-bar, substantially as described.

9. The combination of a set of type-bars, a set of operating-levers each connected with one of said type-bars, and arranged to operate one of the same when moved endwise, a stop on each of said levers, a segment-shaped power-bar, means for movably supporting the power-bar so that it will remain substantially parallel with a given plane in its several positions, a cam-lug on each of said levers, a set of key-levers corresponding to said levers, an arm on each of the key-levers arranged to engage, during the first part of movement of the key-levers, a cam-lug on said operating-levers and thereby rock the lever and bring its stop into position to engage the said power-bar, and means on the key-levers arranged to cause, upon a further movement of the same after rocking said cam-lever, said power-bar to be operated, substantially as described.

10. The combination of a set of type-bars, a set of operating-levers each connected with one of said type-bars and arranged to operate one of the same when moved endwise, a stop on each of said levers, a power-bar, a cam-lug



on each of said levers, a set of key-levers corresponding to said levers, an arm on each of the key-levers arranged to engage the cam-lug on one of the said operating-levers and thereby rock the lever and bring its stop into position to engage the said power-bar, an electromagnet, an armature connected with said power-bar and arranged to operate the same when attracted by its magnet, a notched detent pivoted on each of the key-levers, a series of terminal levers, each arranged to engage one of said detents, a series of terminals each arranged to be engaged by one of the said terminal levers, a beveled stop on each of said detents arranged to engage its appropriate terminal lever on the downward movement of the key-lever and thereby cause said terminals to engage after the said key-lever shall have moved its coacting operating-lever into position of engagement with the power-bar, said notched detent being arranged to be rocked upon a further depression of the key-bar and release said terminals, being also arranged to be rocked on the return movement of the key-lever to avoid the adjacent terminal lever, substantially as described.

11. The combination with a set of operating-levers, of a set of key-levers, each arranged for selecting a particular operating-lever, a magnetically-operated power-bar, means operating during the depression of the key-lever for positioning a selected operating-lever into the path of the power-bar, a power-bar magnet, means for energizing the power-bar magnet during the further depression of the key-lever, and, during an additional, continued depression of the power-bar, for deenergizing the power-bar magnet, independent of the movement of the power-bar, and independent means connecting with the operating-levers and constructed to return the same to normal position independent of the position and movement of the power-bar, substantially as described.

12. The combination with a set of operating-levers, of a set of key-levers, each arranged for selecting a particular operating-lever, a magnetically-operated power-bar, means operating during the depression of the key-lever for positioning a selected operating-lever into the path of the power-bar, a power-bar magnet, and means for energizing the power-bar magnet during the further depression of the key-lever, and, during an additional, continued depression of the power-bar, for deenergizing the power-bar magnet independent of the movement of the power-bar, the power-bar and the operating-levers being constructed and relatively arranged to permit return of the key-levers to normal position independent of the position and movement of the power-bar, and the key-lever being constructed to return to said normal position without again effecting energizing of

the power-bar magnet, substantially as described.

13. The combination with a set of operating-levers, of a set of key-levers, each arranged for selecting a particular operating-lever, a magnetically-operated power-bar, means operating during the depression of the key-lever for positioning a selected operating-lever into the path of the power-bar, a power-bar magnet, means for energizing the power-bar magnet during the further depression of the key-lever, and, during an additional, continued depression of the power-bar, for deenergizing the power-bar magnet independent of the movement of the power-bar, and means for effecting return to normal position of the operating-levers, independent of the movement of the key-lever, substantially as described.

14. The combination with a set of operating-levers, of a set of key-levers, each arranged for selecting a particular operating-lever, a magnetically-operated power-bar, means for movably supporting the power-bar, means operating during the depression of the key-lever for positioning a selected operating-lever into the path of the power-bar, a power-bar magnet, means for energizing the power-bar magnet during the further depression of the key-lever, and, during an additional continued depression of the power-bar, for deenergizing the power-bar magnet independent of the movement of the power-bar, means for effecting return to normal position of the operating-levers independent of the movement of the key-levers, and means for effecting return of the key-lever to normal position without again energizing the power-bar magnet, substantially as described.

15. The combination with a series of pivoted type-bars and operating-levers connected therewith, of a set of movable key-levers for selecting a particular type-bar-operating arm, a magnetically-actuated power-bar arranged to operate a selected operating-lever to actuate a type-bar, an electric current-controlling device operated by each key-lever to effect closing and then opening of an electric circuit independent of the movement of the power-bar for operating and returning the selected operating-lever during the downstroke of the key-lever, and means constructed to return the type-bar to normal position after actuation independent of the return movement of the key-lever and type-bar-operating-arm, substantially as described.

16. The combination with a series of pivoted type-bars and operating-levers connected therewith, of a set of movable key-levers for selecting a particular type-bar operating arm, a magnetically-actuated power-bar arranged to operate a selected operating-lever to actuate a type-bar, an electric current-controlling device operated by each key-lever to effect closing and then opening of an electric



4 circuit independent of the movement of the  
power-bar for operating and returning the  
selected operating-lever during the down-  
stroke of the key-lever, and means for effect-  
5 ing return of the key-lever to normal position  
without again closing the electric circuit,  
substantially as described.

10 17. The combination with a set of oper-  
ating-levers, of a set of key-levers, each ar-  
ranged for selecting a particular operating-  
lever, a magnetically-operated power-bar,  
means operating during the depression of the  
key-lever for positioning a selected operat-  
15 ing-lever into the path of the power-bar, a  
power-bar magnet, means for energizing the  
power-bar magnet during the further depres-  
sion of the key-lever, and, during an addi-  
tional, continued depression of the power-  
20 bar, for deenergizing the power-bar magnet  
independent of the movement of the power-  
bar, means for effecting return to normal  
position of the operating-levers independent  
of the movement of the key-levers, means for  
25 effecting return of the key-lever to normal  
position without again energizing the power-  
bar magnet, actuating type-bars, and means  
constructed to return the type-bars to nor-  
mal position, after each actuation, independ-  
30 ent of the return to normal position of the  
key-levers, substantially as described.

18. The combination with a set of oper-  
ating-levers, of a set of key-levers, each ar-  
ranged for selecting a particular operating-  
lever, a magnetically-operated power-bar,  
means operating during the depression of the 35  
key-lever for positioning a selected operating-  
lever into the path of the power-bar, a power-  
bar magnet, means for energizing the power-  
bar magnet during the further depression of  
the key-lever, and, during an additional, con- 40  
tinued depression of the power-bar, for deen-  
ergizing the power-bar magnet independent  
of the movement of the power-bar, means for  
effecting return to normal position of the  
power-bar and the operating-levers inde- 45  
pendent of the movement of the key-levers,  
means for effecting return of the key-lever to  
normal position without again energizing  
the power-bar magnet, actuating type-bars,  
and means constructed to return each type- 50  
bar to normal position, after actuation, inde-  
pendent of the position of the power-bar,  
substantially as described.

In testimony whereof I affix my signature  
in the presence of two subscribing witnesses. 55

GEORGE W. DONNING.

Witnesses:

ANDREW W. STEIGER,  
CHARLES GIBBS.