No. 879,814. PATENTED FEB. 18, 1908.

G. W. DONNING.

ELECTRICAL TYPE WRITER.

APPLICATION FILED MAR. 28, 1903.

3 SHEETS—SHEET 1.

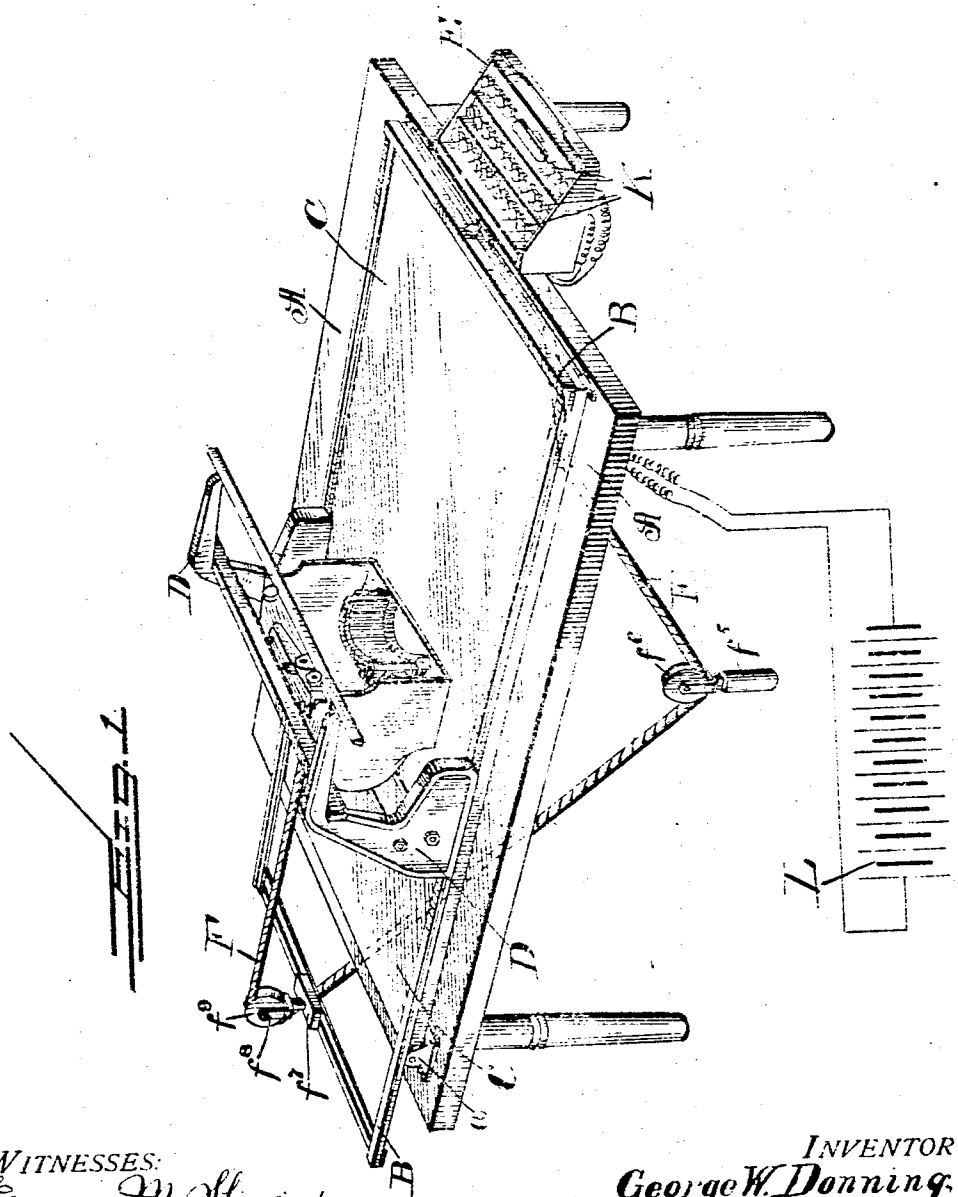


Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 2.

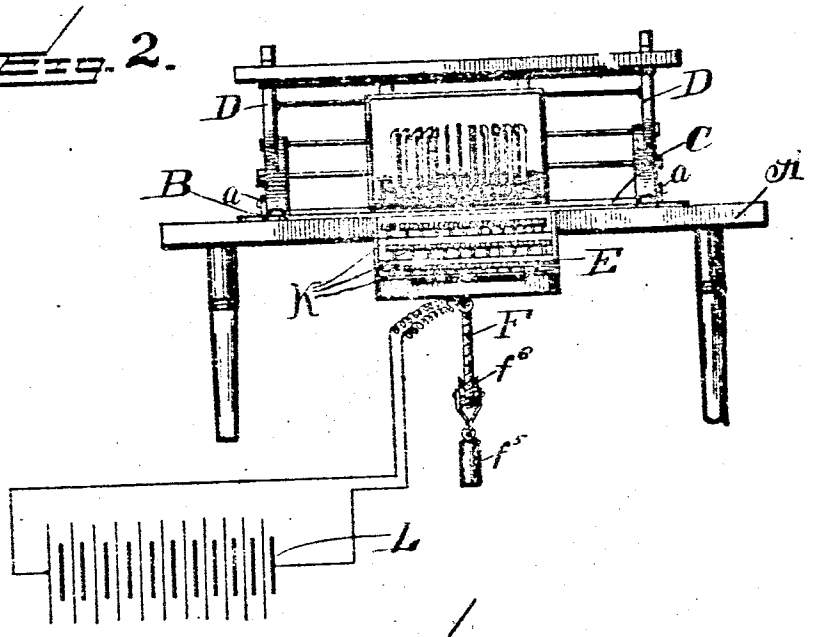
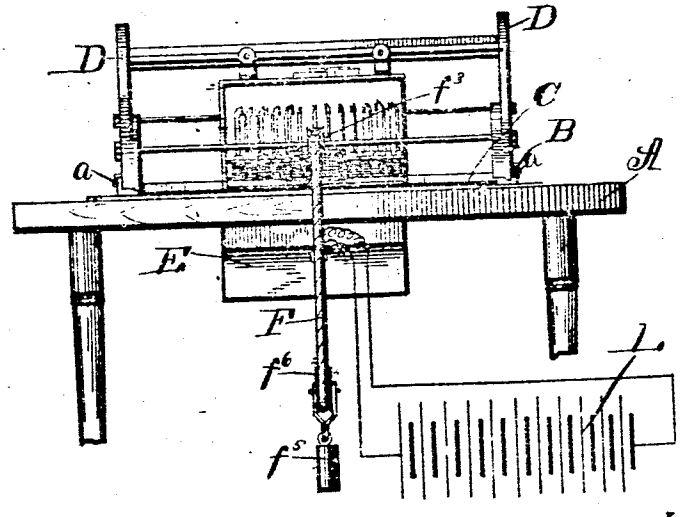


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 4.

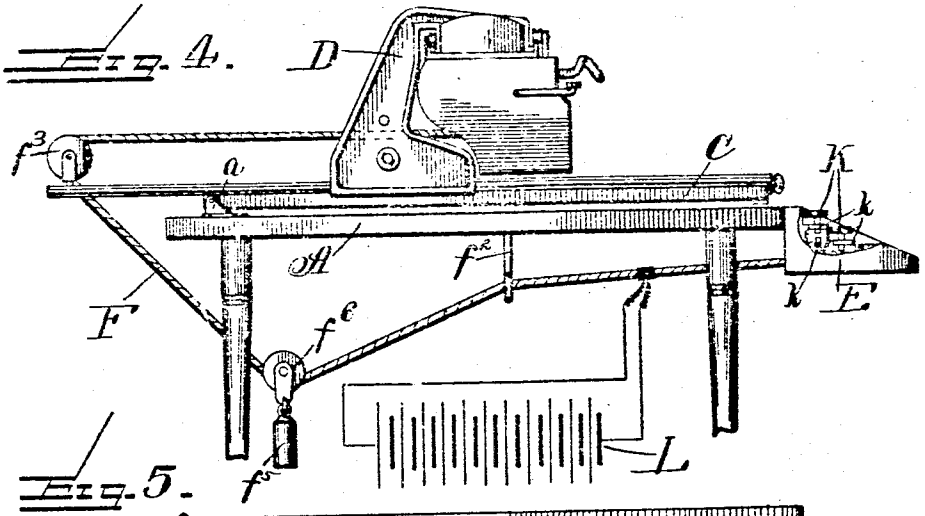


Fig. 5.

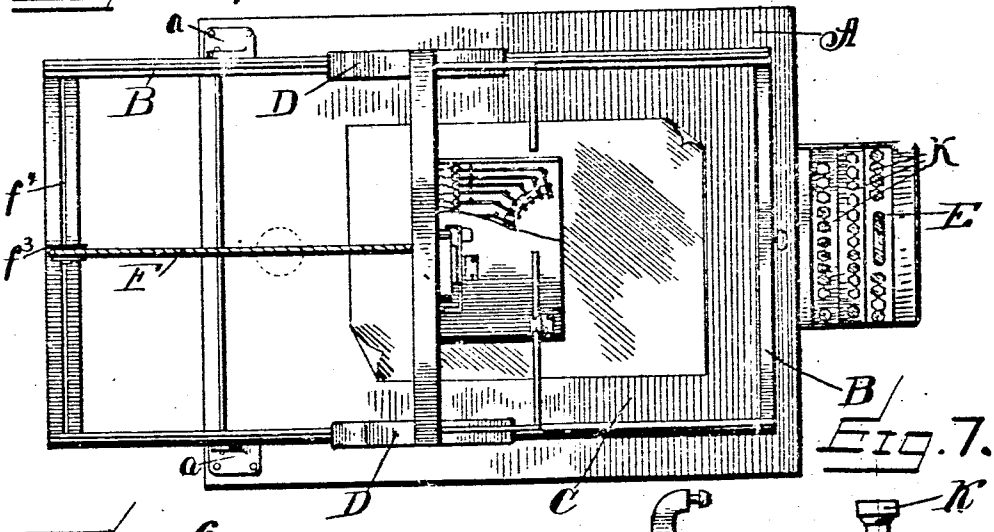
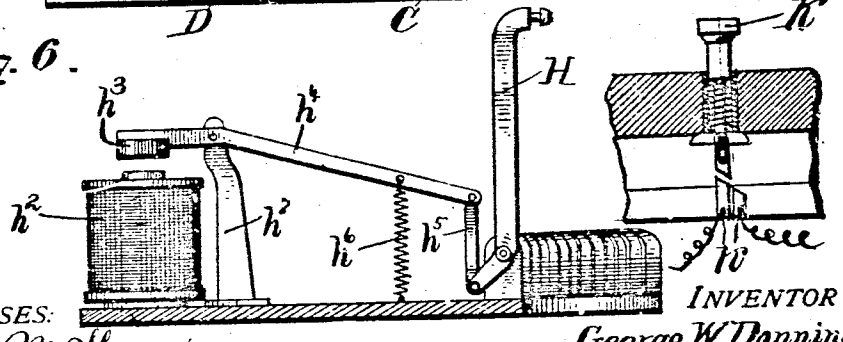


Fig. 7.

Fig. 6.



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UNITED STATES PATENT OFFICE.

GEORGE W. DONNING, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO HARRY T. AMBROSE, OF ORANGE, NEW JERSEY.

ELECTRICAL TYPE-WRITER.

No. 879,814. Specification of Letters Patent. Patented Feb. 18, 1908.

Application filed March 28, 1903. Serial No. 150,031.

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 the transmission of the energy or power applied to the operating mechanism of a writing machine to the writing mechanism when one of these mechanisms is movable relative to the other.

Another object is to provide means for the transmission of power from a stationary source to a movable writing mechanism.

A further object is to provide a stationary key-board, movable writing mechanism, a stationary writing surface, and connections between the key-board and the movable writing mechanism.

A further object of this invention is to obviate the use of a movable key-board which necessitates reaching by the operator over all points of the platen.

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

In the drawings, representing an apparatus embodying my invention: Figure 1 is a perspective view; Fig. 2 is a front elevation; Fig. 3 is a rear elevation; Fig. 4 is a side elevation; Fig. 5 is a view in plan; and Fig 6 is a detail of the type-bar and operating magnet. Fig. 7 is a fragmentary view, partly in section, of the key-device and an underlying terminal-device.

I have preferably illustrated my invention as applied to a machine for writing upon a continuous or loose sheet or page of a book laid on a flat surface or platen, but it will be easily understood that the paper may be fed over or around a cylindrical platen, adapted to rotate contiguous to the writing mechanism, and successively bring the several lines of the receiving paper into position to be printed upon.

In the several views, in which the characters of reference indicate the same parts: Upon the table A are mounted the track-rails B, and the flat platen C, such as are employed in what are known as book-typewriters, or flat-platen commercial typewriters. The track-frame may be hinged at *a* to the base, and thus be tiltable, if desired. The carriage-frame D is preferably slidable along the rails B and supports a writing-mechanism-carriage d^2, movable transversely thereon to effect letter-spacing, as is customary in this class of machines, where the work, the book, or sheets are held stationary on the normally-stationary platen.

As shown, the track-frame extends some distance to the rear of hinge-point *a* so that, when the carriage-frame and its supported writing-mechanism-carriage are disposed beyond the hinge-point, the weight of these parts will, when the track-frame is released at the front, tend to tilt the forward portion of the track-frame.

The writing-mechanism on the carriage comprises the type-bars that, when operated, print the characters on the work placed on the platen, while the keys are disposed in a stationary bank E preferably at the front of the table, frame, or platen.

To transmit the operative power, passing through or controlled by the keys, to the movable carriage carrying the type-bars, I use a flexible member F, preferably in the form of a cable, having one end connected with the key-board, then passing from a support f^2 around a pulley f^3 preferably arranged to slide transversely on a slotted frame-tie-bar-supporting member f^4 extending along the rear of the track-frame or table; or simply a round roller may be used, from which the member F extends to and is connected with the carriage. It is necessary to have the member F of such length as to permit the full traverse of the carriage-frame to the front of the platen, or to a position nearest the operator, as well as to permit of the transverse movement of the carriage. To take up slack in the flexible member and prevent it falling upon the platen or work, I provide a pulley f^6, riding on the member F underneath the table, and carrying a suitable weight f^5. If preferred, a spring, or other device, may be used to keep the cable taut.

If preferred, a block f^7 may slide on the tie-bar f^4 and carry a bearing member f^8 swiveled thereon, and a pulley f^9 is rotatably

supported on the bearing member, over which pulley the flexible member passes.

I preferably make use of electricity as a means to operate the writing mechanism. The type-bars H³, H are each operated by an electro-magnet h^2, having an armature h^3. A lever h^4 fulcrumed on a standard h^7 has one end attached to the armature h^3 and its other end pivoted to a link h^5, the latter being preferably pivoted to the lower end of the type-bar H. When a current is passed through the electro-magnet, it attracts the armature and, through the lever, causes the type bar to strike the platen. And, when the circuit is broken, a retractile spring h^6 returns the type-bars and armature to their normal positions.

The keys K are movably disposed in the stationary key-board E, and, when depressed, effect contact between subjacent electrical terminals k, k, which, as shown in Figs. 4 and 7, are arranged independent of the movable key, though in the path of movement of the key.

The cable F is preferably composed of a number of insulated, flexible conductors, that form a circuit from each of the electro-magnets h^2 to an appropriate key-terminal k, k, and which circuits each include a suitable source of electricity, such as a battery L. Consequently, when any one of the keys is depressed, a circuit will be completed through one of the electro-magnets h^2, and the type-bar corresponding to the key will be operated. And the flexible cable F will permit of the operation of the type-bars by the keys, whatever be the position of the carriage frame.

Any appropriate means may be employed to effect letter and line spacing.

From the above, it will be seen that the operator does not have to move the hands to follow the traverse of the carriage and type-bars across the platen, nor to move them to different positions along the platen to accommodate for the line-spacing, as is necessary where the keys are located on the movable carriage and carriage-frame, and hence are shifted both longitudinally and transversely to follow the printed space on the work.

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. In an electrical writing machine, the combination with a platen, a longitudinally-traveling carriage, and a transversely-traveling carriage supported on the longitudinally-traveling carriage, of a stationary key-board disposed independent of said carriages, movable operating-keys positioned in said key-board, electrical terminals disposed independent of said keys and in the path of movement thereof, operating members comprising type-bars disposed in and traveling with said laterally traveling carriage, rocking levers also disposed in said laterally-traveling carriage and connected to said typebars, armatures carried at one end of said rocking levers, electro-magnets disposed in juxtaposition to said armatures and constructed to effect rocking of said levers, and electric connections between said electrical terminals and electro-magnets and constructed, when said operating keys are moved, to effect a circuit through the terminals and electro-magnets to operate said typebars, substantially as described.

2. In an electrical writing machine, the combination with a platen, a longitudinally-traveling carriage, and a transversely-traveling carriage supported on the longitudinally-traveling carriage, of a stationary key-board disposed independent of said carriages, movable operating-keys positioned in said key-board, electrical terminals disposed independent of said keys and in the path of movement thereof, operating-members comprising typebars disposed in and traveling with said laterally-traveling carriage, rocking levers also disposed in said laterally-traveling carriage and connected to said typebars, armatures carried at one end of said rocking-levers, electro-magnets disposed in juxtaposition to said armatures and constructed to effect rocking of said levers, electric connections between said electrical terminals and electro-magnets and constructed, when said operating-keys are moved, to effect a circuit through the terminals and electro-magnets to operate said typebars, and a source of electrical supply common to said electric connections.

3. In an electrical writing machine, the combination with a platen, a track-frame, a longitudinally-traveling carriage disposed to travel on said track-frame, and a transversely-traveling carriage supported on the longitudinally-traveling carriage, of a stationary key-board disposed independent of said carriages, movable operating-keys positioned in said key-board, electrical terminals disposed independent of said keys and in the path of movement thereof, operating members comprising typebars disposed in and traveling with said laterally-traveling carriage, rocking levers also disposed in said laterally-traveling carriage and connected to said typebars, armatures carried at one end of said rocking levers, electro-magnets disposed in juxtaposition to said armatures and constructed to effect rocking of said levers, and electric connections between said electrical terminals and electro-magnets and constructed, when said operating-keys are moved, to effect a circuit through the terminals and electro-magnets to operate said typebars, substantially as described.

4. In an electrical writing machine, the combination with a platen, a hinged track-frame, a longitudinally-traveling carriage disposed to travel on said track-frame, and a

transversely-traveling carriage supported on the longitudinally-traveling carriage, of a stationary key-board disposed independent of said carriages, movable operating-keys positioned in said key-board, electrical terminals disposed independent of said keys and in the path of movement thereof, operating members comprising typebars disposed in and traveling with said laterally-traveling carriage, rocking levers also disposed in said laterally-traveling carriage and connected to said typebars, armatures carried at one end of said rocking levers, electro-magnets disposed in juxtaposition to said armatures and constructed to effect rocking of said levers, and electric connections between said electrical terminals and electro-magnets and constructed, when said operating-keys are moved, to effect a circuit through the terminals and electro-magnets to operate said typebars, substantially as described.

5. In an electrical writing machine, the combination with a platen, a hinged, tiltable track-frame, a longitudinally-traveling carriage disposed to travel on said track-frame, and a transversely-traveling carriage supported on the longitudinally-traveling carriage, of a stationary key-board disposed independent of said carriages, movable operating keys positioned in said key-board, electrical terminals disposed independent of said keys and in the path of movement thereof, operating members comprising typebars disposed in and traveling with said laterally-traveling carriage, rocking levers also disposed in said laterally-traveling carriage and connected to said typebars, armatures carried at one end of said rocking levers, electro-magnets disposed in juxtaposition to said armatures and constructed to effect rocking of said levers, and electric connections between said electrical terminals and electro-magnets and constructed, when said operating-keys are moved, to effect a circuit through the terminals and electro-magnets to operate said typebars, substantially as described.

6. In an electrical typewriter, the combination with a platen, a track-frame, a longitudinally-traveling carriage arranged to travel on said track-frame, a transversely-traveling carriage supported on said longitudinally-traveling carriage, of a stationary key-board disposed independent of said platen and track-frame, movable operating-keys positioned in said key-board, electrical terminals disposed independent of, and in the path of, said operating-keys, downwardly-acting typebars disposed in the transversely-traveling carriage, rocking levers connecting with said bars, supporting posts upon which said bars are fulcrumed, armatures carried at the end of said rocking levers, electro-magnets disposed in juxtaposition to said armatures and constructed to effect rocking of said levers and actuate the typebars, and electric connections between said terminals and electro-magnets.

7. In an electrical typewriter, the combination with a platen, a tiltable track-frame, a longitudinally-traveling carriage arranged to travel on said track-frame, and when disposed to the rear thereof to tilt the frame, a transversely-traveling carriage supported on said longitudinally-traveling carriage, of a stationary key-board disposed independent of said platen and track-frame, movable operating-keys positioned in said key-board, electrical terminals disposed independent of, and in the path of, said operating-keys, downwardly-acting typebars disposed in the transversely-traveling carriage, rocking levers connecting with said bars, supporting posts upon which said bars are fulcrumed, armatures carried at the end of said rocking levers, electro-magnets disposed in juxtaposition to said armatures and constructed to effect rocking of said levers and actuate the typebars, and electric connections between said terminals and electro-magnets.

8. In an electrical typewriter, the combination with a platen, a track-frame, a longitudinally-traveling carriage arranged to travel on said track-frame, a transversely-traveling carriage supported on said longitudinally-traveling carriage, of a stationary key-board disposed independent of said platen and track-frame, movable operating-keys positioned in said key-board, electrical terminals disposed independent of, and in the path of, said operating-keys, downwardly-acting typebars disposed in the transversely-traveling carriage, rocking levers connecting with said bars, supporting posts upon which said bars are fulcrumed, armatures carried at the end of said rocking levers, electro-magnets disposed in juxtaposition to said armatures and constructed to effect rocking of said levers and actuate the typebars, means for effecting return of the typebars to normal position and simultaneously rocking the armatures away from said electro-magnets, and electric connections between said terminals and electro-magnets.

9. In an electrical typewriter, the combination with a platen, a track-frame, a longitudinally-traveling carriage arranged to travel on said track-frame, a transversely-traveling carriage supported on said longitudinally-traveling carriage, of a stationary key-board disposed independent of said platen and track-frame, movable operating-keys positioned in said key-board, electrical terminals disposed independent of, and in the path of, said operating-keys, downwardly-acting typebars disposed in the transversely-traveling carriage, rocking levers connecting with said bars, supporting posts upon which said bars are fulcrumed,

armatures carried at the end of said rocking levers, electro-magnets disposed in juxtaposition to said armatures and constructed to effect rocking of said levers and actuate the typebars, and retractile springs for effecting return of the typebars to normal position and simultaneously rocking the armatures away from said electro-magnets.

10. In an electrical writing machine, the combination with a platen, a longitudinally-traveling carriage, and a transversely-traveling carriage supported on the longitudinally-traveling carriage, of a stationary-key-board disposed independent of said carriages, movable operating-keys positioned in said key-board, electrical terminals disposed independent of said keys and in the path of movement thereof, operating members comprising typebars disposed in and traveling with said laterally-traveling carriage, rocking levers also disposed in said laterally-traveling carriage and connected to said typebars, armatures carried at one end of said rocking levers, electro-magnets disposed in juxtaposition to said armatures and constructed to effect rocking of said levers, and flexible electric connections between said terminals and electro-magnets, one end of said connections remaining stationary in said key-board and the other end traveling with said traveling carriage.

11. In an electrical writing machine, the combination with a platen, a longitudinally-traveling carriage, and a transversely-traveling carriage supported on the longitudinally-traveling carriage, of a stationary key-board disposed independent of said carriages, movable operating-keys positioned in said key-board, electrical terminals disposed independent of said keys and in the path of movement thereof, operating members comprising typebars disposed in and traveling with said laterally-traveling carriage, rocking levers also disposed in said laterally-traveling carriage and connected to said typebars, armatures carried at one end of said rocking levers, electro-magnets disposed in juxtaposition to said armatures and constructed to effect rocking of said levers, flexible electric connections between said terminals and electro-magnets, one end of said connections remaining stationary in said key-board and the other end traveling with said traveling carriage, and means for supporting said connections intermediate of their length.

12. In an electrical writing machine, the combination with a platen, a longitudinally-traveling carriage, and a transversely-traveling carriage supported on the longitudinally-traveling carriage, of a stationary key-board disposed independent of said carriages, movable operating-keys positioned in said key-board, electrical terminals disposed independent of said keys and in the path of movement thereof, operating members comprising typebars disposed in and traveling with said laterally-traveling carriage, rocking levers also disposed in said laterally-traveling carriage and connected to said typebars, armatures carried at one end of said rocking levers, electro-magnets disposed in juxtaposition to said armatures and constructed to effect rocking of said levers, flexible electric connections between said terminals and electro-magnets, one end of said connections remaining stationary in said key-board and the other end traveling with said traveling carriage, a pulley for sustaining said connections, and means for rotatably and slidably supporting said pulley to permit positioning of the same relative to the carriages.

13. In an electrical writing machine, the combination with a platen, a longitudinally-traveling carriage, and a transversely-traveling carriage supported on the longitudinally traveling carriage, of a stationary key-board disposed independent of said carriages, movable operating-keys positioned in said key-board, electrical terminals disposed independent of said keys and in the path of movement thereof, operating members comprising typebars disposed in and traveling with said laterally-traveling carriage, rocking levers also disposed in said laterally-traveling carriage and connected to said typebars, armatures carried at one end of said rocking levers, electro-magnets disposed in juxtaposition to said armatures and constructed to effect rocking of said levers, flexible electric connections between said terminals and electro-magnets, one end of said connections remaining stationary in said key-board and the other end traveling with said traveling carriage, a pulley for sustaining said connections, and means for rotatably and slidably supporting said pulley to permit positioning of the same relative to the carriages.

14. In an electrical writing machine, the combination with a platen, a longitudinally-traveling carriage, and a transversely-traveling carriage supported on the longitudinally-traveling carriage, of a stationary key-board disposed independent of said carriages, movable operating-keys positioned in said key-board, electrical terminals disposed independent of said keys and in the path of movement thereof, operating members comprising typebars disposed in and traveling with said laterally-traveling carriage, rocking levers also disposed in said laterally-traveling carriage and connected to said typebars, armatures carried at one end of said rocking levers, electro-magnets disposed in juxtaposition to said armatures and constructed to effect rocking of said levers, flexible electric connections between said terminals and electro-magnets, one end of said connections re-

electro-magnets disposed in juxtaposition to said armatures and constructed to effect rocking of said typebars, flexible connections between said terminals and electro-magnets, one of said connections remaining stationary in said key-board and the other end traveling with said traveling carriage, means for supporting said connections intermediate their length, and means for maintaining the same taut during the traveling movement of both of said carriages either longitudinally or transversely.

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

GEORGE W. DONNING.

Witnesses:
ANDREW W. STEIGER,
JOHN R. WILTSIE.