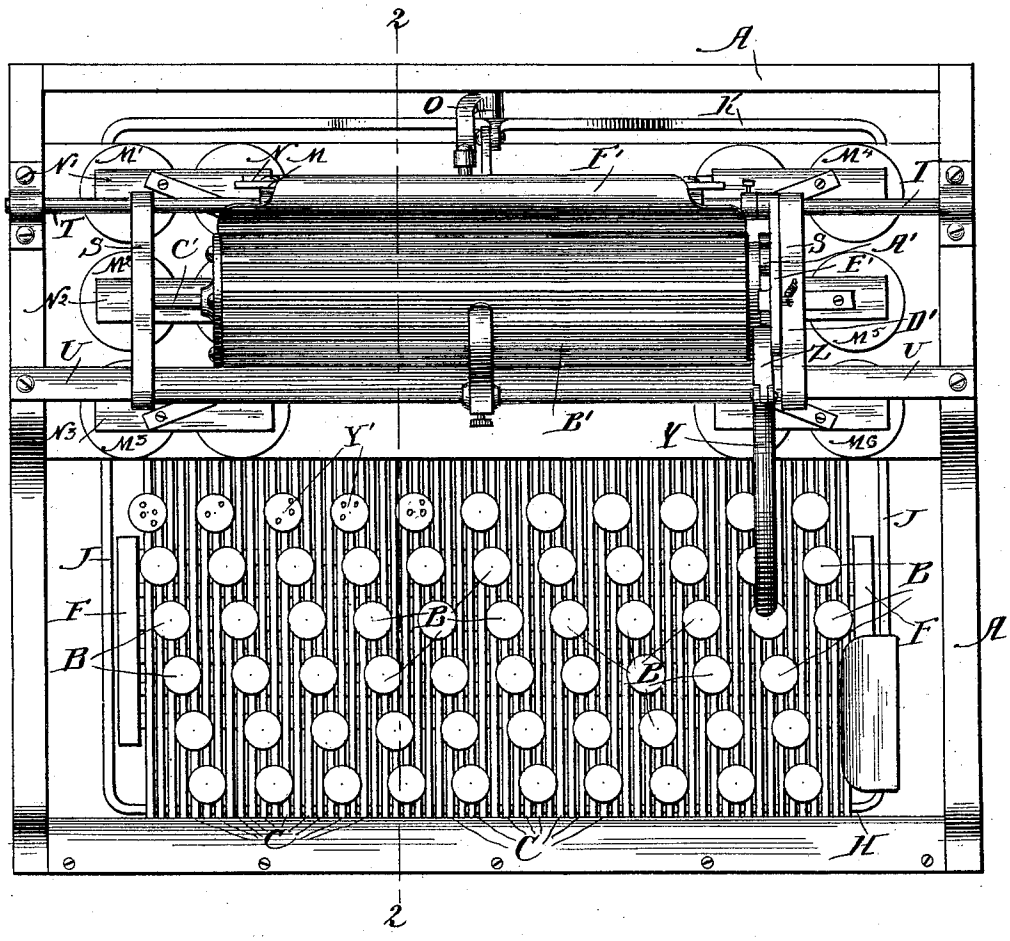
(No Model.) 3 Sheets—Sheet 1

E. J. NOLAN.

TYPE WRITING MACHINE FOR THE BLIND.

No. 422,614. Patented Mar. 4, 1890.

Fig. 1



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Fig. 2.

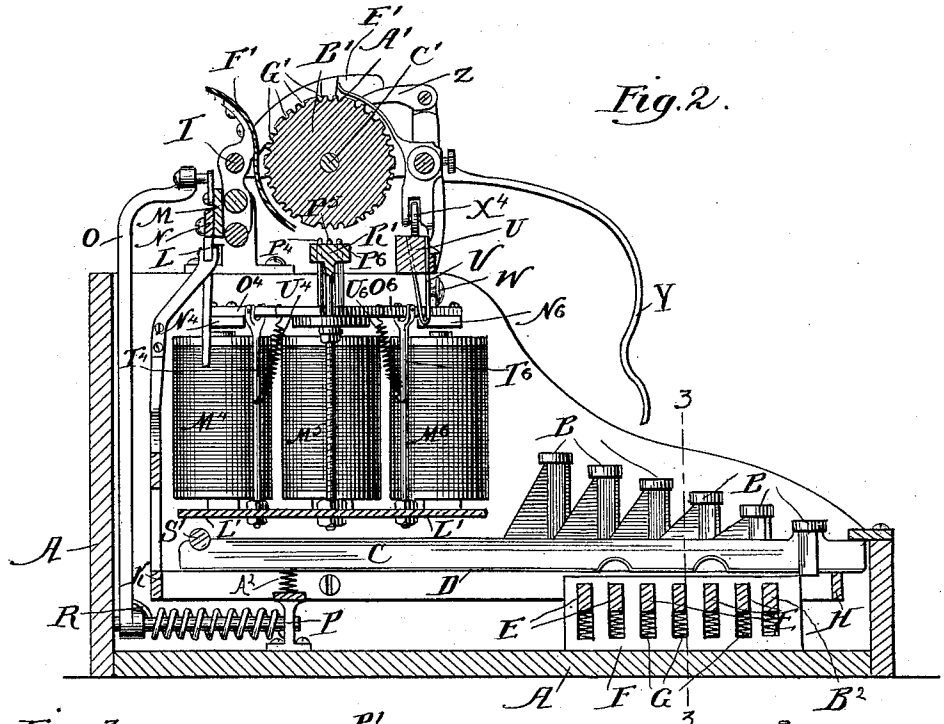
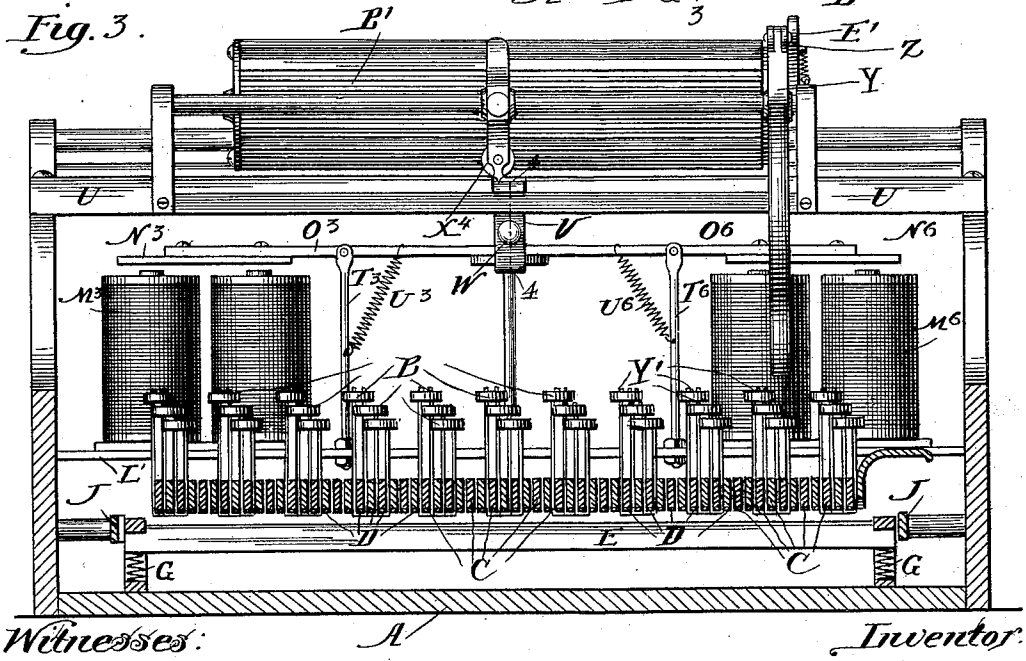


Fig. 3.



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(No Model.) 3 Sheets—Sheet 3.

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Fig. 4

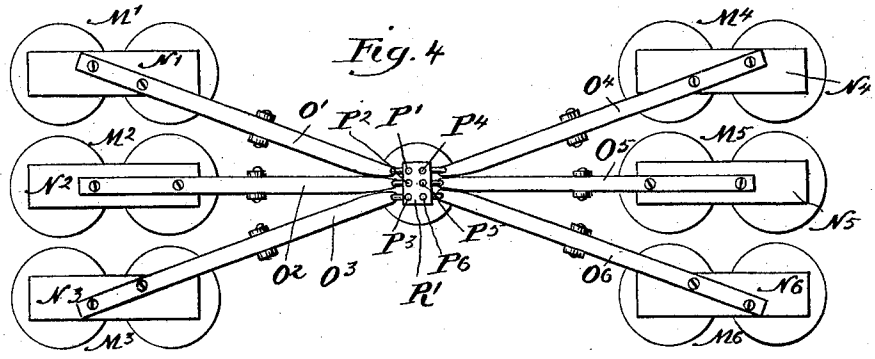


Fig. 5.

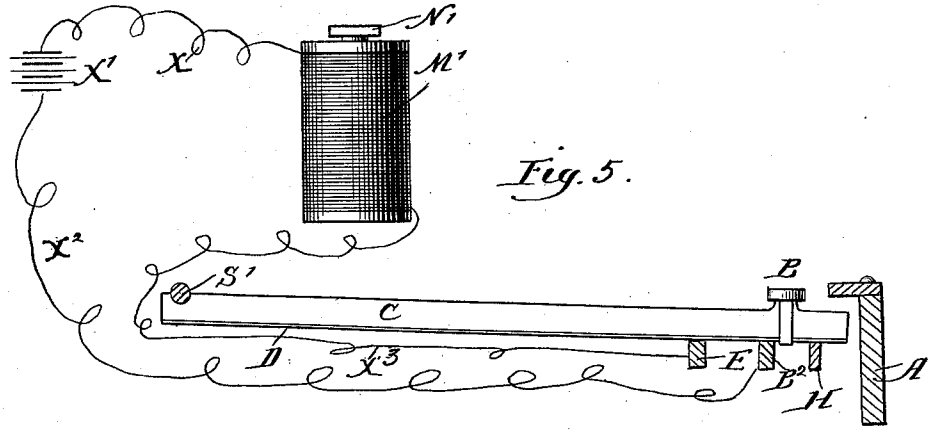


Fig. 8.

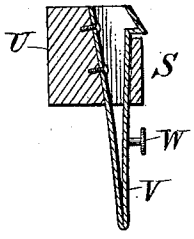


Fig. 6.

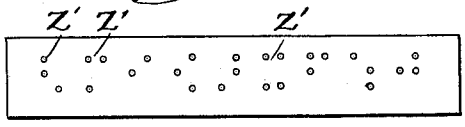
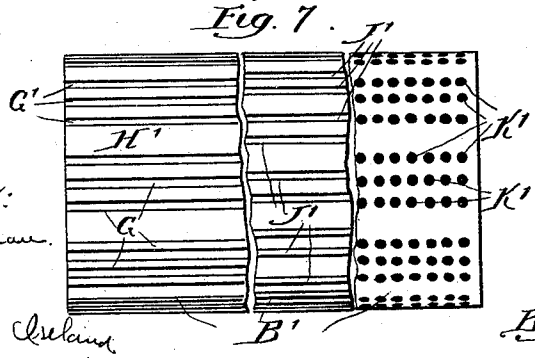


Fig. 7.



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UNITED STATES PATENT OFFICE.

EDWARD J. NOLAN, OF CHICAGO, ILLINOIS.

TYPE-WRITING MACHINE FOR THE BLIND.

SPECIFICATION forming part of Letters Patent No. 422,614, dated March 4, 1890.

Application filed October 22, 1888. Serial No. 288,855. (No model.)

To all whom it may concern:

Be it known that I, EDWARD J. NOLAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Type-Writing Machines for the Blind, of which the following is a specification.

My invention relates to writing-machines, particularly such as are designed for the use of the blind, and has for its object to provide a machine capable of printing embossed characters, and particularly such characters as are used in the system of writing for the blind known as the "Brail" system and similar systems. This object I accomplish by means of the mechanism illustrated in the accompanying drawings, wherein—

Figure 1 is a plan view of my device. Fig. 2 is a cross-section on the line 2 2 of Fig. 1. Fig. 3 is a cross-section on the line 3 3 of Fig. 2. Fig. 4 is a plan view of the printing characters and the armatures and electro-magnets which control them. Fig. 5 is a detailed diagrammatic view of one electro-magnet finger-lever and connections. Fig. 6 is a detail of the printing. Fig. 7 contains three details of the platen and two modifications thereof. Fig. 8 is an enlarged sectional detail, section being taken at line 4 4, Fig. 3.

Like parts are indicated by the same letters in all the figures.

A is a frame of an ordinary and convenient size and shape, having bearings for the various parts of the device.

B B are the keys, each attached to its particular finger-lever C. Each of these finger-levers is pressed upwardly by a spring A^2 and provided along its lower margin with the metallic strip D and bent upwardly at points, so to engage the cross-bars in groups.

E E are cross-bars supported at their extremities in the insulated block F by the spiral springs G.

H is a metallic escapement-bar continuous at its extremities with the side rods J J, which in turn connect at their extremities with the bar K, to which the feed mechanism is attached in the usual manner of type-writers—that is to say, from the bar K rises an arm or arms terminating in the rocking-clutch L, which engages the teeth on the ratchet-bars M N. The bar M is rigid with the platen-carriage and is forwardly urged by means of the arm O, secured on the shaft P, and which is rotated over toward the right when forced by means of the spiral spring R. I make no claim on this feeding mechanism, as it is old, but simply describe it to exhibit the operation of my device.

S is the platen-carriage, pivoted so as to slide on the rod T and resting upon the guide U, to which it is locked when desired by the spring-catch V, having the thumb-piece W. The forward part of the carriage is provided with one or more rollers X^4, to freely ride upon the guide U. The shifting-lever Y is similar to that usually employed, being provided with a pawl Z to engage the teeth on the ratchet-wheel A′, which is rigid with the platen B′. Said platen is journaled on the shaft C′ on the carriage.

Pivoted to the rod T is the arm D′, carrying the spring-actuated dog E′, adapted to engage teeth on the ratchet-wheel A′ and lock the same in position.

F′ is a rigid paper-guide.

G′ G′ are grooves upon the face of the rotating platen, being usually three grooves, and then an intermediate space H′. J′ J′ are similar grooves arranged in groups of two each, and K′ K′ are holes arranged in lines as modifications of the grooves, as hereinafter explained.

L′ is a base-plate rigidly supported on the frame and carrying six double electro-magnets indicated by the signs M′ M^2 M^3 M^4 M^5 M^6. Suspended above each electro-magnet is an armature N′ N^2 N^3 N^4 N^5 N^6. To each of these armatures is secured a pivoted armature-lever O′ O^2 O^3 O^4 O^5 O^6, and each of these latter carries a printing character or punch P′ P^2 P^3 P^4 P^5 P^6, which punches pass through and are guided by the die-plate R′. The finger-levers are pivoted upon the rod S′ and upwardly held by the rod-spring A^2. The armature-levers are pivoted upon standards, as T^3 T^6, and are retracted from their respective

magnets by spiral springs, as U^3 U^6. From each of the electro-magnets passes a conductor X to the battery X′, whence passes a conductor X^2 to the main connecting-bar B^2. This bar, as is seen and described, is in contact with the metallic strip on the lower edge of each of the finger-levers when such lever is depressed. From each of the cross-bars E passes a conductor X^3 to one of the electro-magnets.

Y′ are the raised characters on the keys B B, raised so as to be felt and recognized by the blind.

Z′ Z′ are the printed characters, made by embossed or raised dots on the sheet of paper in groups.

The main connecting-bar B^2 is insulated and a short distance below the finger-bars. It receives the current from the battery and supplies it to the finger-bars as they descend.

The use and operation of my invention are as follows: The paper is fed into the machine in a manner similar to that of ordinary type-writers, and this part of the device is not therefore very fully described. At the end of each line the platen is rotated and returned to the initial position in the usual manner of type-writers. The platen is provided with a series of longitudinal grooves, three such grooves lying close together when the machine is adapted for writing "Brail," and two of such grooves when the machine is adapted for writing the "New York Point" method. In the Brail all letters or signs are formed of combinations of dots or raised places, falling within two vertical rows of three each. In the New York method there are but two horizontal rows of various lengths; hence the necessity for the difference in the platen. For the continuous grooves a series of holes could be substituted, and if the paper were fed by other means than the rotation of the platen the latter might be flat. The printing characters are therefore in this instance simply plain punches, though of course the operation of the machine would be the same were these punches not similar and if each had a distinct character at its striking end. These punches are arranged in rows, which must register with the grooves or holes in the platen; hence the necessity of having the platen rigidly locked in position. These punches are required to strike with considerable force; hence the necessity of having the platen locked down upon the frame. Each printing character is supported at the end of the pivoted spring-retracted armature-lever, and each of such levers is controlled by an electro-magnet. It is apparent that when a current passes through any one or more of these electro-magnets the corresponding printing character will be actuated; hence by arranging the finger-levers so that the depression of each will cause currents to flow through a distinct combination of such electro-magnets a similar combination of said printing characters will be actuated to emboss upon the paper letters or signs similar to those shown in Fig. 6. Each finger-lever is kept normally elevated above by the spiral spring beneath it. Below the finger-levers are a series of spring-supported insulated cross-bars, from each of which a connector passes through one of said electro-magnets and thence to the battery. A second connector passes from said battery to an insulated connecting-bar, against which all of the finger-levers stop when depressed. Each of the finger-levers is formed on its lower edge so as when forced down to engage a distinct and unique combination of the cross-bars. Each of these finger-levers, as above described, is provided along its lower edge with a bent continuous connector, so that when it descends a series of circuits are formed, each of which embraces the connector from the connecting-bar to the battery and such connecting-bar and the strip on the bottom of the finger-lever. The remainder of each of said circuits is made up from the finger-lever at each point at which it strikes one of the six cross-bars, thence through said cross-bar, thence to its connected electro-magnet, and thence to the battery. Thus there will be circuits through as many electro-magnets as the number of cross-bars engaged, and these electro-magnets will be energized to operate their respective printing characters. Of course the combination of printing characters operated will depend upon the combination of cross-bars engaged.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is as follows:

1. In a type-writer, the combination of a rotating indented platen with a series of needles reciprocating toward the same, a series of electro-magnets, each one of which controls one needle, a battery, a series of cross-bars, an insulated connecting-bar, a series of circuits containing each the battery, one magnet, one of the cross-bars, and the insulated connecting-bar, a series of finger-levers and keys, and circuit-closers attached to each and so shaped as to close each a unique combination of circuits when depressed.

2. In a type-writer, the combination of an indented rotating platen, a series of electrically-actuated needles reciprocating toward such platen, a battery, a series of cross-bars, an insulated connecting-bar, a series of circuits, each controlling one needle, and a series of finger-bars and keys, each containing a circuit-closer so shaped as when depressed to touch a unique combination of cross-bars, and thus operate a unique combination of needles.

3. In a type-writer, the combination of an indented rotating platen, a series of electrically-actuated needles reciprocating toward such platen, a battery, a series of cross-bars, a series of circuits, each controlling one needle and connected each with one bar, an insulated connecting-bar to which all such circuits are connected, a series of finger-bars and keys, each carrying a circuit-closer so shaped as when depressed to engage the insulated bar, and a unique combination of the cross-bars to actuate a unique combination of the needles.

Chicago, October 6, 1888.

his
EDWARD J. × NOLAN.
mark

Witnesses to Edward J. Nolan's mark:
FRANCIS W. PARKER,
CELESTE P. CHAPMAN.