

(No Model.)

5 Sheets—Sheet 1.

H. HOLLERITH.  
KEYBOARD PUNCH.

No. 487,737.

Patented Dec. 13, 1892.

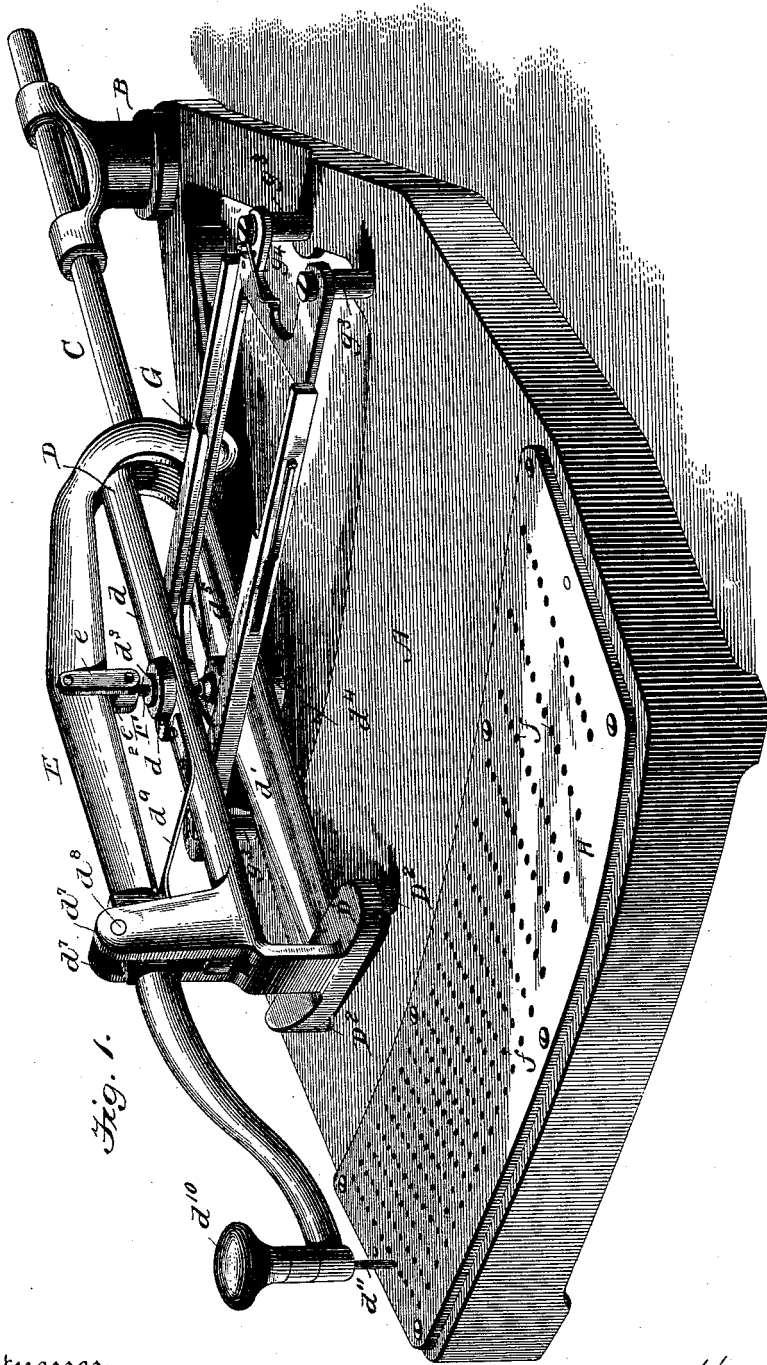


Fig. 1.

Witnesses

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(No Model.)

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Fig. 2.

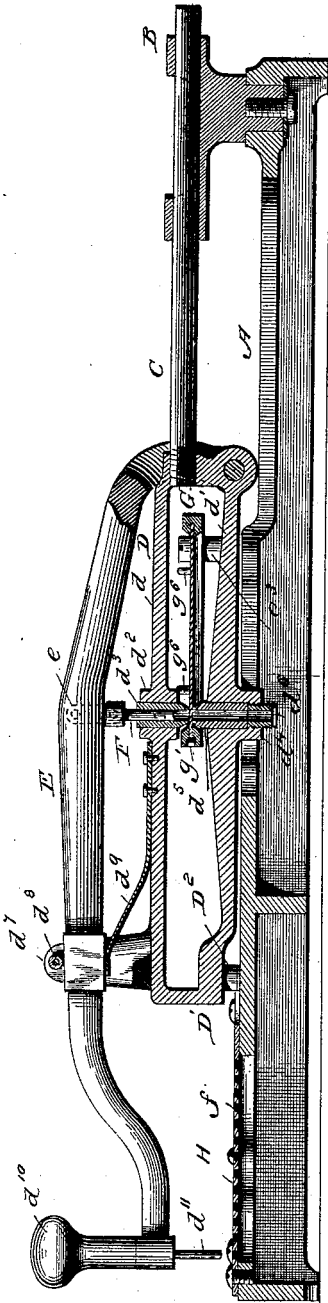


Fig. 4.

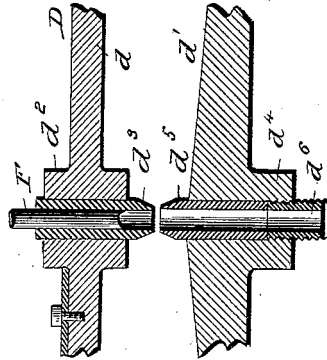


Fig. 3.

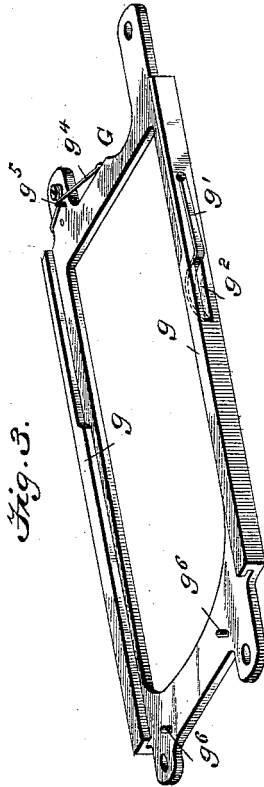
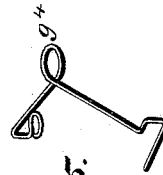


Fig. 5.



WITNESSES  
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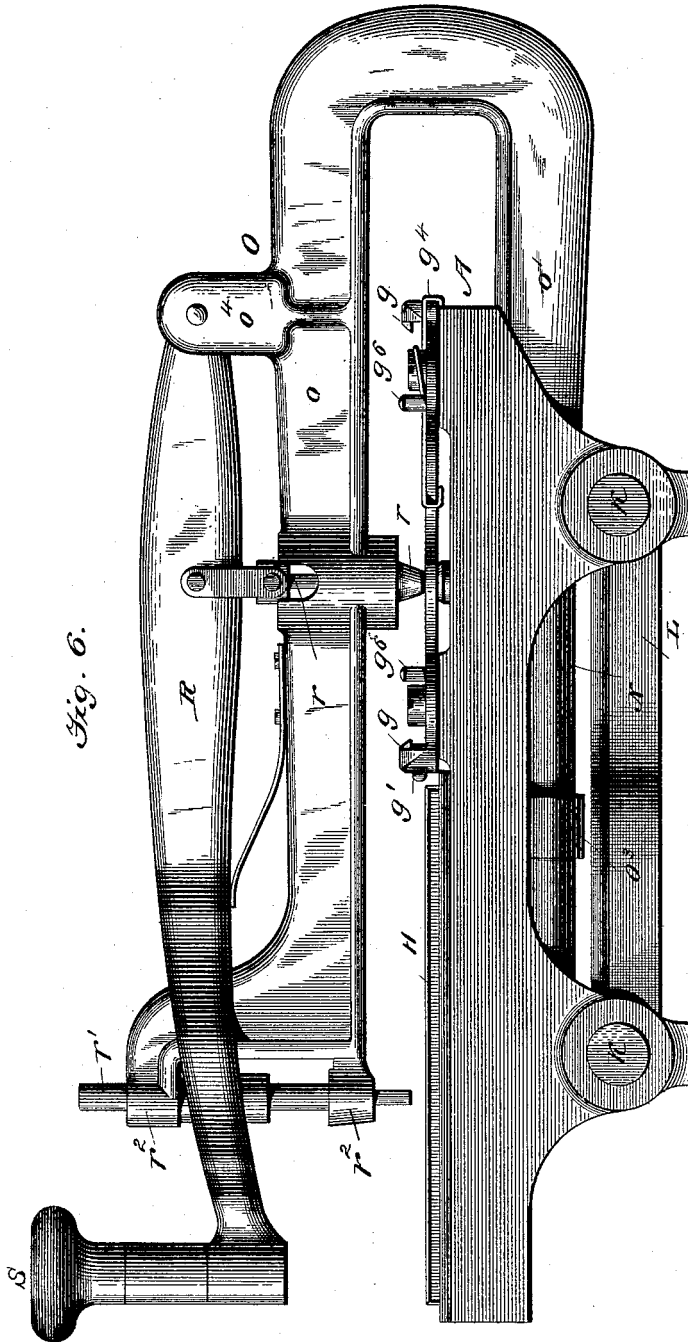


Fig. 6.

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(No Model.)

5 Sheets—Sheet 4.

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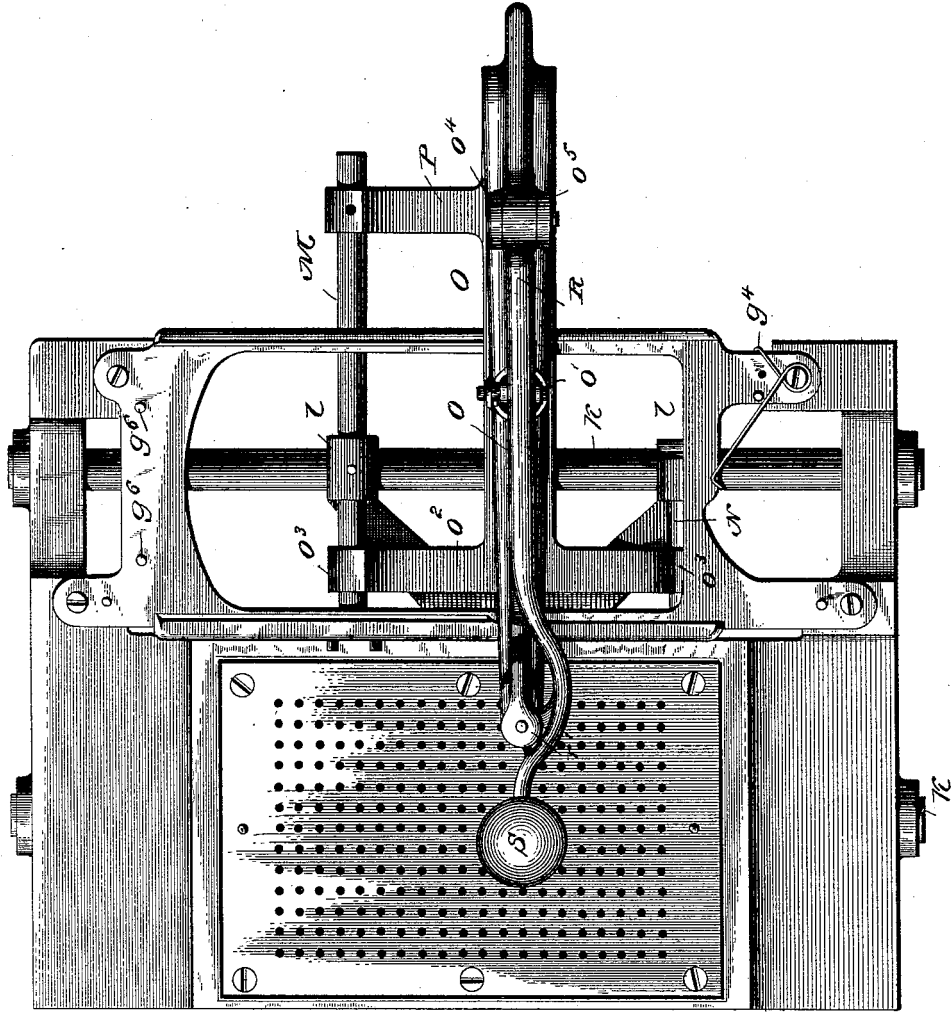


Fig. 4.

WITNESSES

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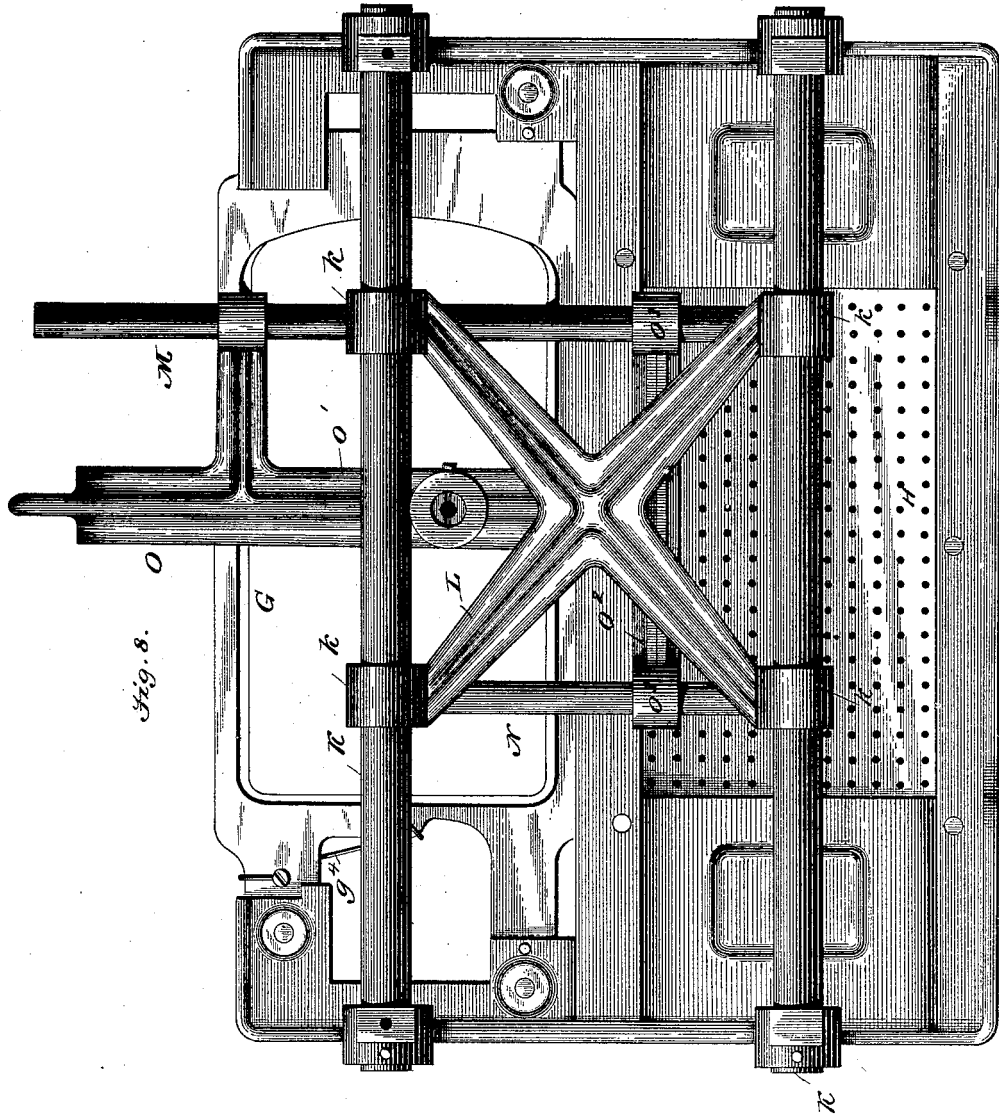
(No Model.)

5 Sheets—Sheet 5.

H. HOLLERITH.  
KEYBOARD PUNCH.

No. 487,737.

Patented Dec. 13, 1892.



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# UNITED STATES PATENT OFFICE.

HERMAN HOLLERITH, OF WASHINGTON, DISTRICT OF COLUMBIA.

## KEYBOARD-PUNCH.

SPECIFICATION forming part of Letters Patent No. 487,737, dated December 13, 1892.

Application filed March 10, 1891. Serial No. 384,498. (No model.)

*To all whom it may concern:*

Be it known that I, HERMAN HOLLERITH, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Keyboard-Punches; 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.

This invention relates to certain new and useful improvements in keyboard-punches, and is more especially intended for the purpose of punching or perforating the cards or slips of paper used in the Hollerith electric tabulating system. In said system cards or slips of paper are employed which are perforated at given or predetermined points to indicate certain facts, items, or conditions; and it is the object of the present invention to provide a machine whereby said cards or slips of paper may be perforated or punched at the desired points with speed and accuracy.

To this end my invention consists in a suitable frame carrying a card-holder, a punch adapted to engage and punch a card held by said holder, mechanism for operating the punch, a keyboard supported upon the frame, an index-finger movable over the face of the keyboard, and mechanism controlled by the index-finger to cause the punch to engage and punch the card at a point corresponding to the position of the index-finger upon the keyboard, all of which will be fully hereinafter described, and afterward definitely pointed out in the claims, due reference being had to the accompanying drawings, wherein—

Figure 1 is a perspective view of my device. Fig. 2 is a longitudinal vertical section thereof. Fig. 3 is a detail perspective view of the card-holder. Fig. 4 is a detail view of the punch; Fig. 5, a detail view of the card-retaining spring; Fig. 6, a side elevation of a modified form of the machine; Fig. 7, a top plan view thereof, and Fig. 8 a bottom plan view of the same.

Referring to Figs. 1 to 5, inclusive, A indicates a base or frame of any suitable configuration, in the rear end of which is mounted a swivel B, capable of being revolved or rotated. Passing through said swivel is a shaft C, which

is free to reciprocate back and forth therein and which is connected at its forward end with a frame D. Said frame is preferably formed in one piece and consists of an upper member  $d$  and a lower member  $d'$ , the upper member  $d$  having formed therewith a perforated boss  $d^2$ , within which is fitted a sleeve  $d^3$ , projecting below the boss and adapted to rest upon the card to be punched and strip the card from the punch as the latter is withdrawn. The lower member  $d'$  is likewise formed with a perforated boss  $d^4$  immediately below the boss  $d^2$ , within which is fitted a sleeve  $d^5$ , held in position and adjusted toward or from the sleeve  $d^3$  by a perforated screw-threaded plug  $d^6$ . The forward end of the frame D is provided with a foot  $D'$ , upon the under side of which are secured suitable bearings  $D^2$ , which will slide easily and noiselessly over the frame A.

E indicates a lever, the rear end thereof being bifurcated and pivoted or hinged to the rear end of the frame D, as shown. To said lever E and at a point immediately over the sleeve  $d^3$  are pivoted two links  $e e$ , within the lower ends of which is pivoted a punch F. Said punch consists of a rod or cylindrical piece of metal the lower face of which is concave or hollowed out in such manner that its periphery will form a knife-edge. The forward end of the member  $d$  of the frame D is formed with two upwardly-projecting lugs  $d^7 d^7$ , united at their tops by a pin  $d^8$ , which embraces the lever E.

To the member  $d$  of the frame D is secured a spring  $d^9$ , the free end of which bears against the under side of the lever E and maintains it in an elevated position, except when depressed by the operator, as will more fully hereinafter appear. The extreme forward end of the lever E carries a knob  $d^{10}$  and a downwardly-projecting pin or finger  $d^{11}$ .

Upon the forward end of the frame A is secured a keyboard H, having a series of perforations  $f$ , adapted to receive the finger or pin  $d^{11}$ .

At a suitable point upon the frame A is secured a card-holder or frame G. Said frame is rectangular in shape and of a width just sufficient to receive the card to be punched. Upon each side said card-holder is provided for a portion of its length with an inwardly-turned

flange  $g$ , underneath which the card is inserted, and upon one side is secured a spring  $g'$ , the free end of which projects through a slot  $g^2$  and bears against the edge of the card. The card-holder G is supported upon four posts or pillars  $g^3$ , to which it is secured by screws, as shown, and lies between the members  $d$  and  $d'$  of the frame D. To one end of said card-holder is secured a spring  $g^4$ , of the shape shown in Fig. 5, and which is preferably passed around one of the screws screwing in one of the pillars or posts  $g^3$  and limited in its movement by a pin  $g^5$ , the free end of said spring pressing against the end of the card held in the holder G. The other end of the card-holder is provided with two projecting pins  $g^6$   $g^6$ , by means of which and the springs  $g'$  and  $g^4$  the card is held firmly in its place within the card-holder G.

Any suitable form of spring may be substituted for the spring shown in Fig. 5.

The operation of the machine above described is as follows: A card of the proper size and shape is inserted within the card-holder G, passing between the sleeves  $d^8$   $d^5$ , and the knob  $d^{10}$  grasped by the operator and the finger  $d^{11}$  brought into position over the particular perforation in the keyboard F which indicates the item that it is desired to record. The lever E and frame D being secured to the frame A by the shaft C, passing loosely through the rotating sleeve B, it will be apparent that the finger  $d^{11}$  can readily be brought over any one of the perforations in the keyboard H, and, pressure being applied, the lever E is depressed, causing the punch F to descend and perforate the card at a point corresponding with the position of the perforation in the keyboard, in which the finger  $d^{11}$  has descended. The perforations in the keyboard are properly indicated by letters or figures indicating the items to be punched in the cards, and every time the finger  $d^{11}$  is caused to enter one of said perforations the card will be punched at a corresponding point, the planchets or punched portions of the paper dropping down through the perforated sleeve  $d^5$  and plug  $d^6$ .

In Figs. 6, 7, and 8 I have shown a modified form of machine operating in substantially the manner before described. Referring to said figures, A indicates a rectangular frame, upon the under side of which are rigidly secured two transverse rods K K. L indicates an X-shaped frame having four sleeves or collars  $k$ , which encircle the rods K K, the frame L sliding upon said rods from side to side. Upon the upper sides of said sleeves or collars  $k$   $k$  are formed bearings  $l$   $l$ , within which are rigidly secured rods M and N, the rod M being longer than the rod N and extended to the rear of the machine for a suitable distance. O indicates a frame consisting of the members  $o$  and  $o'$ , the lower member  $o'$  being provided at its extremity with a transverse arm  $o^2$ , having at each extremity a sleeve or collar  $o^3$ , which encircles the rods M and N, and

upon which rods the frame O has a free longitudinal movement. For the purpose of insuring the movement of the frame O in a perfectly-right line the member  $o'$  near its rear extremity is provided with an arm P, having at its extremity a sleeve or collar  $p$ , encircling and sliding upon the extended portion of the rod M. The member  $o'$  of the frame O is formed with two lugs  $o^4$   $o^5$ , between which is pivoted a lever R, carrying a punch  $r$ , said punch being similar in all respects to that before described, and said lever R is secured near its free end to an index-finger  $r'$ , sliding in bearings  $r^2$  upon the extremity of the member  $o$  of the frame O. Upon the extreme end of the lever R is mounted a knob S.

In all other respects the machine just described is constructed like that shown in Figs. 1 to 5 and its operation the same, excepting that in the modified form of machine the frame carrying the punch has a longitudinal movement back and forth upon the rods M and N, and the frame L, on which are mounted said rods, has a transverse movement from side to side upon the rods K K, the index-finger and the punch thus having a universal movement in every direction.

Having thus described my invention, what I claim is—

1. In a punching-machine of the class described, the combination of a frame having mounted thereon a card-holder and a keyboard, an index-finger arranged to have a universal movement over the keyboard, whereby said finger may be moved to any desired point on said keyboard, a punch adapted to engage and punch a card held by the card-holder, and mechanism for operating the punch and controlled by the index-finger, substantially as shown and described, whereby when the punch is operated it will perforate the card at a point corresponding to the point indicated by the index-finger on the keyboard.

2. A machine of the class described, consisting of a frame having mounted thereon a card-holder and a keyboard and a lever carrying a punch and an index-finger, the construction being such that the said lever has a universal movement and the index-finger may be brought into any desired position over the keyboard and when depressed will cause the punch to perforate the card at a point corresponding to the point indicated upon the keyboard by the index-finger, substantially as described.

3. In a punching-machine, the combination, with a frame having mounted thereon a keyboard and a card-holder, of a swinging lever carrying a punch and an index-finger, said index-finger being adapted to be moved in every direction over the keyboard and cause a corresponding movement of the punch over a card held within the card-holder, substantially as shown and described.

4. In a punching-machine, the combination, with a frame having mounted thereon a keyboard and a card-holder, of a swinging frame having a universal movement and a lever

pivoted thereto carrying a punch and an index-finger movable in every direction over the face of the keyboard and controlling the position of the punch on the card, substantially as described.

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5. In a punching-machine, the combination, with a frame having mounted thereon a card-holder, of a swinging frame having a universal movement and carrying two perforated sleeves registering above and below a card held in said card-holder and a lever pivoted to said swinging frame and carrying a punch adapted to be forced through said perforated sleeves, substantially as described.

6. In a punching-machine such as described, a card-holder consisting of a frame having grooved or recessed sides and provided at one end with pins or stops to engage one end of the card and at the other end and side with springs for retaining the card in position, substantially as shown and described.

7. The combination, with a frame having mounted thereon a keyboard, of an index-finger arranged to move over said keyboard, a

card-holder, a punch adapted to engage a card held by the card-holder, and mechanism controlled by the index-finger for adjusting the position of the punch relatively to the card-holder and for operating said punch, whereby when said punch is operated it will perforate the card at a point corresponding to the point indicated by the index-finger on the keyboard, substantially as shown and described.

8. In a punching-machine, the combination, with a frame having mounted thereon a card-holder, of a swinging frame consisting of an upper and lower member which embrace said card-holder and a lever pivoted to said swinging frame and carrying a punch, substantially as shown and described.

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

HERMAN HOLLERITH.

Witnesses:

CHAS. W. EDMONSTON,  
LEVIN S. FREY.