

D. FOXWELL.

Punches and Dies for Making Metal-Cards.

No. 146,665.

Patented Jan. 20, 1874.

Fig. 1.

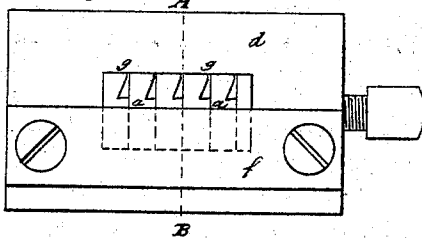


Fig. 2.

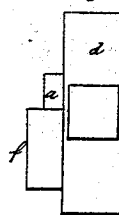


Fig. 3.

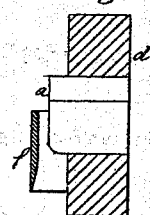


Fig. 4.

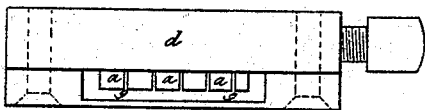


Fig. 5.

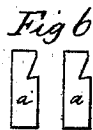
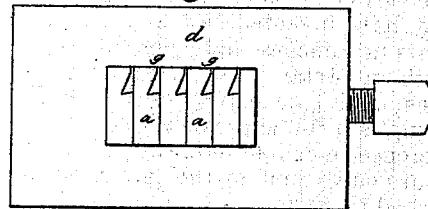


Fig. 7.

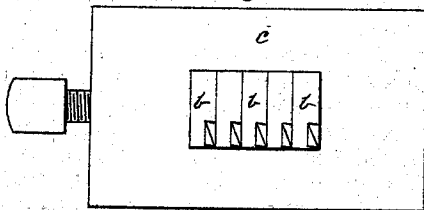


Fig. 9.

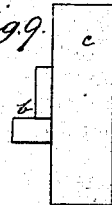


Fig. 10.



Fig. 8.

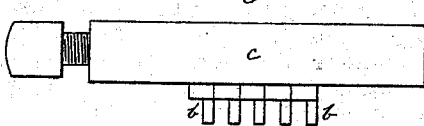


Fig. 11.

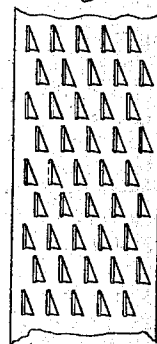


Fig. 12.



Fig. 13.



Fig. 14.

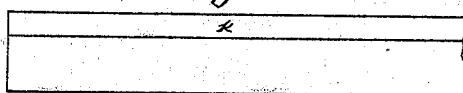


Fig. 15.

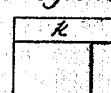


Fig. 16.



Witnesses

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DANIEL FOXWELL, OF MANCHESTER, ENGLAND.

IMPROVEMENT IN PUNCHES AND DIES FOR MAKING METAL CARDS.

Specification forming part of Letters Patent No. 146,665, dated January 20, 1874; application filed December 17, 1873.

To all whom it may concern:

Be it known that I, DANIEL FOXWELL, of Manchester, in the county of Lancaster, England, have invented new and useful Improvements in Punches and Dies for Forming the Teeth in Metal Cards used in Carding-Engines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying sheet of drawings and to the letters of reference marked thereon.

This invention relates to metal cards formed of strips or fillets of steel or other metal, having teeth punched and bent or turned from the metal itself, the strips and teeth being of any required size and strength. My improvement consists in making the dies and punches like type set in boxes, and held fast by screws or wedges, so that if one die or punch breaks it can be instantly taken out and replaced by another; and

On the accompanying sheet of drawings, the dies are marked *a*, Figures 1, 2, 3, 4, 5, and 6, and the punches *b*, Figs. 7, 8, 9, and 10, Fig. 3 being a section of Fig. 1 at the line A B.

The box *c*, containing the row or set of punches, is fixed to the end of the sliding bar of the punching-machine, and the box *d*, containing the dies, is fixed to a bar or plate on the machine, in proper position to receive the punches, the metal strip being between the punches and dies, and receiving the blow or stab at every forward movement of the sliding bar, or at every revolution of the main shaft of the punching-machine.

The punches and dies are of any required size and shape, and Figs. 11 and 12 are front and end views of a piece of card having teeth corresponding with the punches and dies shown in the drawings.

Two sides of each punch cut the metal; the third side turns up the metal as the punch passes through, and forms the teeth or point, so as to produce a card; and in order to pre-

vent the punches from drawing the metal out of its place when they recede, there is a small guide-plate, *f*, Figs. 1, 2, 3, and 4, fixed to the die-box *d*, as close as convenient to the face of the dies, and the bottom edge of the plate and the bottom of the dies are rounded or curved to enable the strip to pass easily onward. At this stage of the operation—that is, after the punches have formed the teeth and receded from the metal—the teeth are in the dies, and at the feeding or taking up of the metal during the working of the punching-machine, the teeth pass through slots *g*, Figs. 1, 4, and 5, formed in the dies, and so leave the dies free for the next operation of the punches.

It is necessary that the punches and dies should be made so as to insure perfect regularity in size and shape, or else one tooth would be higher or lower than the next; and to accomplish this, I plane, in a piece of steel, a half-V groove, *k*, Figs. 13 and 14, of the shape and size required, and for dies a thin shaving is taken off the edge in order to form the slots *g*, Figs. 1, 4, and 5. I then cut the piece into lengths, which are turned edgewise, and so form the dies required, and from the same piece of steel I form the punches from the same half-V groove without the shaving being taken off the edge, and thus perfect accuracy is insured between the punches and dies, the angle of the punch in Figs. 15 and 16 being the same as that of the die.

Having now described my invention, I desire it to be understood that for manufacturing metal cards used in carding-engines, I claim—

The punches and dies *a b*, set in boxes *c d*, substantially as shown and described, and for the purpose specified.

DANIEL FOXWELL.

Witnesses:

G. SEPTIMUS HUGHES,
CHAS. WM. COLLINS.