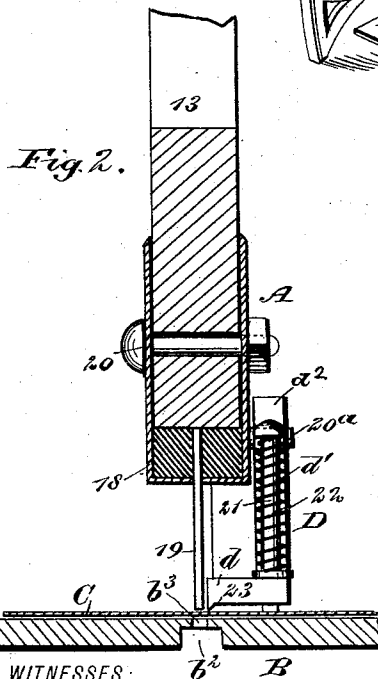
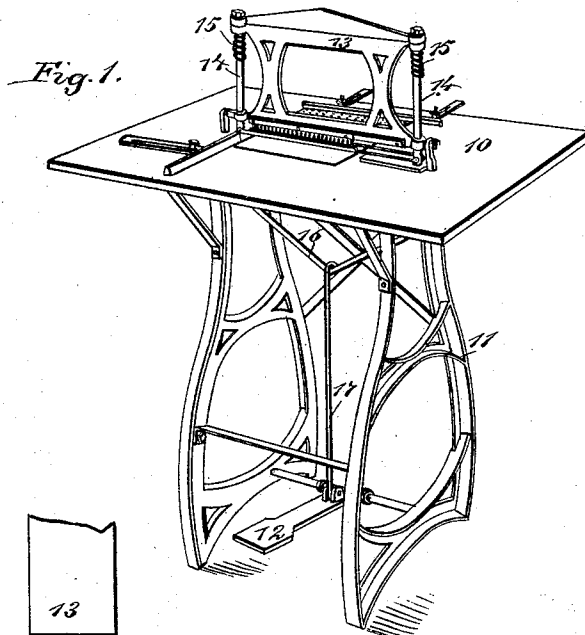


(No Model.)

C. O. MORGAN.
PERFORATING MACHINE.

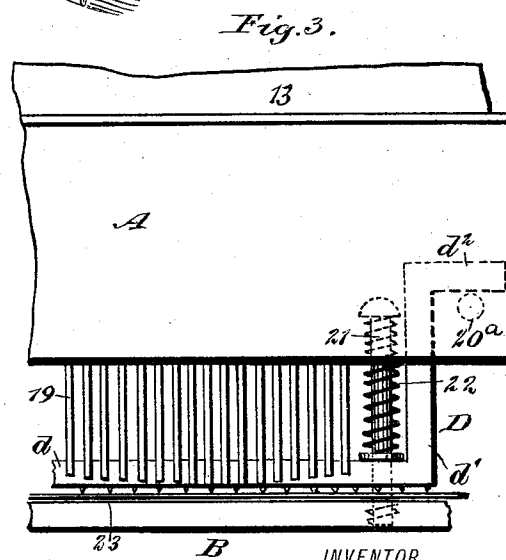
No. 479,294.

Patented July 19, 1892.



WITNESSES:

WITNESSES:
J. McArdle
E. M. Clark



INVENTOR

E. C. Morgan
BY Munn & Co
ATTORNEYS.

UNITED STATES PATENT OFFICE

CHARLES O. MORGAN, OF MORTON, MINNESOTA.

PERFORATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 479,294, dated July 19, 1892.

Application filed August 7, 1891. Serial No. 402,018. (No model.)

To all whom it may concern:

Be it known that I, CHARLES O. MORGAN, of Morton, in the county of Renville and State of Minnesota, have invented a new and useful Improvement in Perforating-Machines, of which the following is a full, clear, and exact description.

My invention relates to an improvement in perforating-machines especially adapted for perforating paper to enable the sections of the paper to be readily detached, the paper to be used in the construction of blank, order, note, or other books, or for equivalent purposes.

The object of the invention is to provide a light, durable, portable, and economic machine capable of being conveniently manipulated and which will perforate the paper without tearing the same, and, further, to provide a cleaner for the paper which will act to prevent the paper, after being perforated, from rising upward with the punches.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claim.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a perspective view of the perforating-machine embodying my improvements. Fig. 2 is a vertical section through a portion of the punch-bar and the sliding frame with which it is connected, and also a vertical section through the dies beneath the punch-bar and the paper, the guide for the paper being in end elevation; and Fig. 3 is a front elevation of a portion of the sliding frame and the punch-bar, the punches and the guide for the paper being also in side elevation.

The table 10 is supported upon suitable legs or standards 11, between which standards, near their lower ends, a treadle 12 is pivoted. Upon the table an essentially-rectangular frame 13 is held to slide upon pillars or posts 14, attached to the table, the said pillars or posts being vertical, and eyes are formed at the ends of the frame and slipped over the posts. The frame 13 is made as light as possible consistent with strength, and its

lower end is normally held at some elevation above the surface of the table by means of springs 15, which springs are coiled around the posts or pillars near their upper ends, being attached to said posts at their lower extremities, and the upper ends of the springs bear against the upper eyes of the sliding frame. In connection with the sliding frame the usual table-gages for the material to be perforated are employed. The frame is drawn downward against the tension of the springs 15 through the medium of a bail 16 or the equivalent thereof, the members of which bail extend upward through apertures in the table and are connected with offsets upon the lower end portions of the sliding frame, the bail 16 being connected with the foot-treadle 12 by a hook or link 17, as is best shown in Fig. 1.

The punch-bar A is attached to the bottom edge of the sliding frame 13, between the posts or pillars 14. The punch-bar consists, preferably, of a metal plate bent, essentially, to a U shape, the bottom being straight, and the width between the side members of the punch-bar is just sufficient to receive the sliding frame.

In the bottom of the punch-bar a filling 18, of solder or other soft metal, is located, against which filling the under side of the sliding frame rests when the punch-bar is in position thereon. This soft-metal filling 18 is placed in the punch-bar in order to fasten the punches 19 rigidly in the bar, and this is accomplished by passing the punches up through the bottom of the bar and then pouring the soft metal in a heated state into the bar, and when the metal cools the punches will be held rigidly in position. The punches are graduated in length from the central punch to the punches at the extremity of the bar. Thus the bottom line of punches at their lower ends incline upward from the center in direction of the end punches of the line.

The punch-bar is attached to the sliding frame through the medium of a series of bolts 20, passing through the side members of the bar and through apertures in the frame, the said bolts being preferably provided with heads at one end and nuts at their opposite ends. The punch-bar is preferably of less length than the frame, a space being made to intervene between one end of the bar and

one end of the frame, as shown in Fig. 1, to accommodate the stubs of books in certain cases.

In the table a die-plate B is inserted, over which the paper or other material C to be perforated is passed. The die is provided with a recess b^3 in its under surface and apertures b^3 of proper size in its upper surface, extending through into the recess, as is best shown in Fig. 2. The groove is intended to facilitate making fine apertures in the plate. The die is so located upon the table that the apertures b^3 therein will be immediately beneath the line of punches.

It is necessary that a stripper-bar D be employed to prevent the paper from rising upward with the punches after a series of perforations have been made. The preferred form of stripper-bar is that illustrated in Figs. 2 and 3, and comprises a horizontal lower member d , extending parallel and at the rear of the line of punches, a vertical member d' , which extends upward at the rear side of the punch-bar, and an upper horizontal member d^2 , which has a bearing at times upon a pin 20^a , located upon the punch-bar. The stripper-bar is held in position through the medium of a bolt 21, which passes through an aperture in the lower horizontal member d and is screwed at its lower end into the die-plate B. The bolt is vertical and is surrounded by a spring 22, which spring has a bearing at one end against the head of the bolt and at the other end against a washer, which engages with the horizontal member of the guide-check, as is best shown in Fig. 3. The tendency of the spring 22 is to force the horizontal member of the stripper-bar down to an engagement with the table 10 or with the paper to be perforated, and in order that a secure bearing may be obtained by the stripper upon the paper its lower horizontal member is preferably provided with a series of spurs 23. Normally the frame 13 is maintained by its springs 15 at such an elevation above the table and die that the punches will be some distance from the die, and paper or other material to be perforated may be readily fed forward over the die, and when the table is in its normal position the guide-check is also held upward by its engagement with the pin 20^a of the punch-bar, as the springs 15 of the sliding frame are much stronger than the spring 22. The material having been placed

upon the die in proper position, the treadle 12 is pressed downward by the foot of the operator, the sliding frame is thereby drawn downward, and the punches are thereby passed through the paper and the apertures in the die. As the sliding frame travels downward, just before the punches enter the paper the stripper-bar will engage with the paper, being freed from the pin 20^a and forced to such an engagement by its spring 22. When the treadle is allowed to return to its normal position, the springs 15 carry the sliding frame 13 upward, and the guide-check continues its pressure upon the paper until the punches have passed upward beyond the paper. Thus the material perforated is effectually prevented from following the upward course of the punches, and the very moment that the punches clear themselves of the material perforated the pin 20^a engages with the stripper-bar and carries said stripper upward with the sliding frame and punch-bar, leaving ample room for the operator to shift the paper for another series of punctures. By making the punches rigid in the punch-bar they need no guides to direct them in their downward movement to the apertures b^3 of the die, and as the lower ends of the punches are arranged in a graduated line somewhat upon the arc of a circle they enter the apertures in the dies with a shearing cut, thereby enabling an operator to expeditiously and with but little power exerted perforate material of great thickness.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

As an improved article of manufacture, a punch-bar consisting of a hard-metal casing comprising a horizontal member and vertical members extending upward from the sides of the horizontal member, punches projected upward through the horizontal member within the casing, a soft-metal bed resting upon the horizontal member of the casing and surrounding the punches, and a locking device whereby the bar is attached above the soft-metal bed to the sliding frame of the perforating-machine, substantially as shown and described.

CHARLES O. MORGAN.

Witnesses:

MARTIN COOK,
T. M. KEEFE,