(No Model.) 2 Sheets—Sheet 1.

J. WHITE & A. O. KITTREDGE.

PERFORATING MACHINE.

No. 435,003. Patented Aug. 26, 1890.

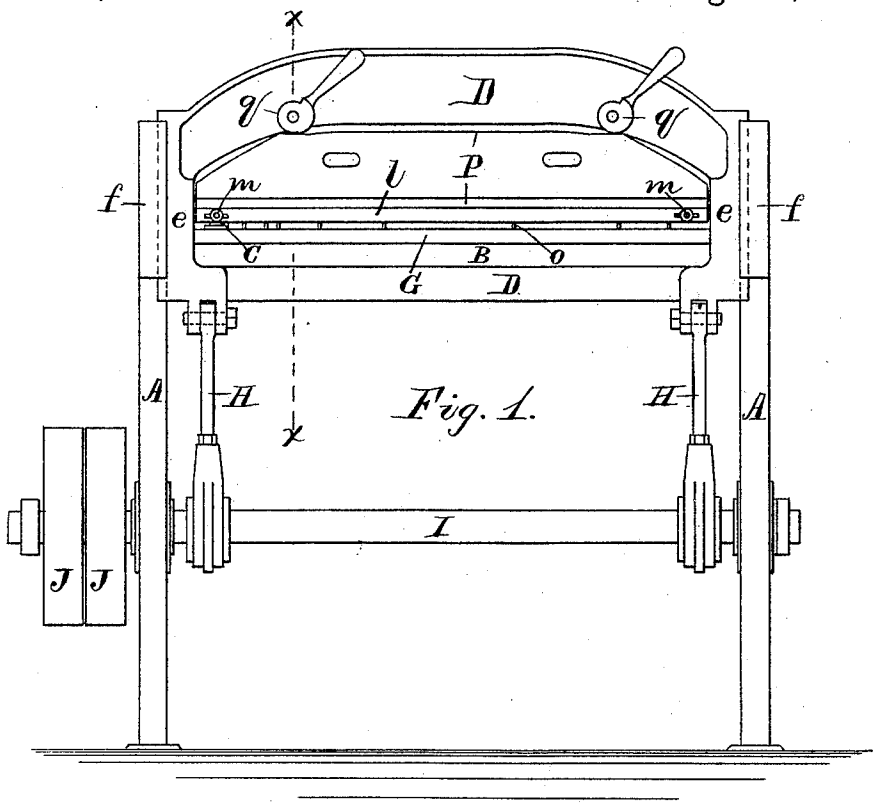

Fig. 1.

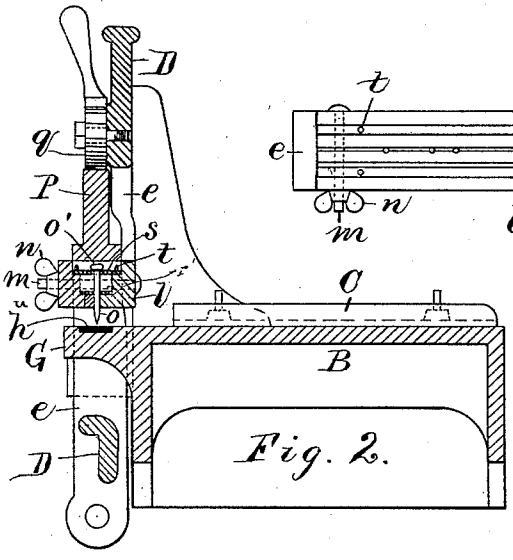

Fig. 2.

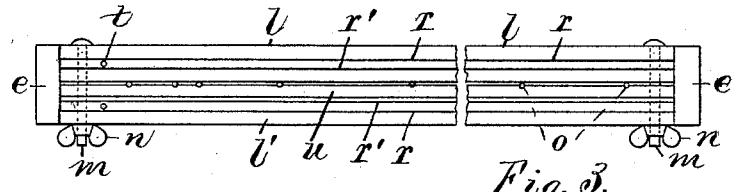

Fig. 3.

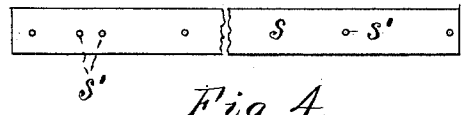

Fig. 4.

Attest:
L. Lee.
F. C. Fischer

Inventor.
J. White and A. O. Kittredge,
per Crane & Miller, Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 5.

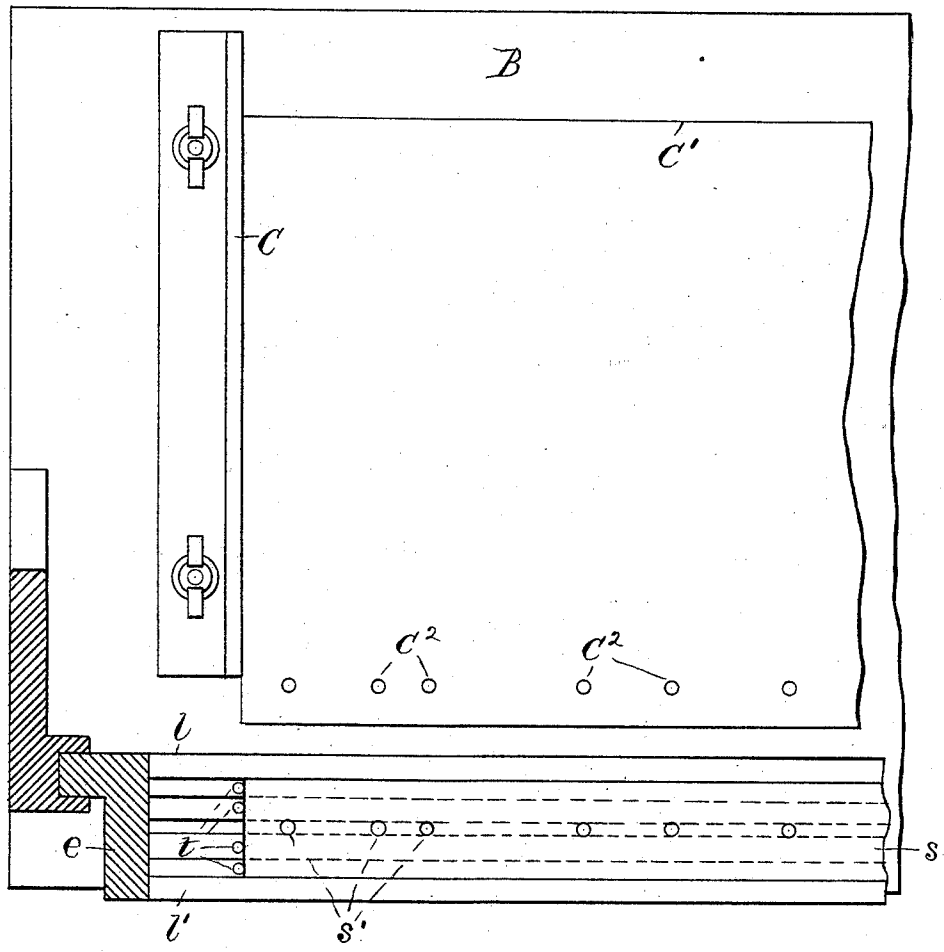
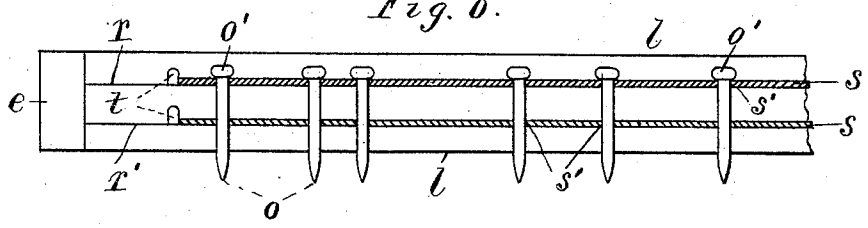


Fig. 6.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES WHITE, OF BROOKLYN, AND ANSON O. KITTREDGE, OF SLATE HILL, NEW YORK, ASSIGNORS TO THE VULCAN COMPANY, OF PENNSYLVANIA.

PERFORATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 435,003, dated August 26, 1890.

Application filed February 7, 1889. Renewed July 30, 1890. Serial No. 360,368. (No model.)

To all whom it may concern:

Be it known that we, JAMES WHITE, of Brooklyn, Kings county, New York, and ANSON O. KITTREDGE, of Slate Hill, Orange county, New York, citizens of the United States, have invented certain new and useful Improvements in Perforating-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of this invention is to facilitate the adjustment of the punches in a machine for pricking or perforating a series of holes simultaneously; and the invention consists, primarily, in the combination, with a series of removable punches, of a strip of metal provided with apertures to fit the punches and adjust them at the desired distance apart.

The invention also consists in the combination, with a suitable holder, of a removable strip of sheet metal provided with holes to set and retain the said punches in their required position.

It also consists in means for clamping the punches when arranged within the holder and set in the required positions by the strip of sheet metal.

The invention will be understood by reference to the annexed drawings, in which—

Figure 1 is a side elevation of a machine provided with our improvement. Fig. 2 is a section on line $x\,x$ in Fig. 1, upon a larger scale, of the bed and the movable cross-head carrying the holder and punches. Fig. 3 is a plan of the holder with the perforated strips or templets removed, and Fig. 4 a plan of the templet or sheet-metal strip for setting the punches. Fig. 5 is a sectional plan of one side of the machine with the punches removed from the holder, the section being taken in the plane of the top of the holder; and Fig. 6, an elevation of the holder with the movable clamp omitted and the templets in section at their center lines.

The invention is illustrated in connection with the pointed punches that are commonly used by cornice-manufacturers for pricking upon sheets of metal suitable marks to guide an operator in afterward bending the sheets. The location of such marks upon the sheet is determined by suitable trial or calculation, and for the purposes of our invention a strip of sheet metal is perforated at suitable points corresponding with the distances between such marks, the first perforation being preferably made at the same distance from the end of the strip as the first mark would be from the edge of the required sheets. The perforations in the strip are made to fit the punches, and the punches being placed therein the strip is then placed within a suitable holder and the punches clamped therein. The setting of the punches in the desired relation to one another is thus effected by the strip itself.

In the perforating-machine illustrated herein an upper and lower strip or templet are shown applied to a suitable holder having an opening at the bottom for the punches inserted in such strips; but the invention may be practiced with only a single strip to locate the punches.

In the drawings, A are the frames of the machine, B a bed for sustaining the sheets to be punched, and D a cross-head with end bars e fitted to guides f upon the frames A. A seat G is shown projected from the bed into a longitudinal opening formed in the cross-head below the holder $l\,l'$, and a strip of soft metal h is shown fitted to such seat to receive the impact of the punches. The cross-head is adapted to be reciprocated, so as to move the holder to and from the seat G, by connecting-rods H, actuated by eccentrics upon a shaft I, having driving-pulleys J. The means for actuating the punches is immaterial, as it forms no part of our present invention. The holder is attached to the end bars e of the cross-head, and consists in a fixed clamp l and movable clamp l', held together by bolts m and nuts n. The clamps are shown formed with two longitudinal rabbeted recesses or channels to admit two strips of sheet metal s, provided with holes s' to receive the punches o. In order to provide the necessary clearance for the effective operation of the clamps, the strips s and s' are formed a little narrower than the rabbeted recesses in which they rest. In Figs. 2 and 3 the wider recess r is shown near the top of the clamps

and a narrower recess r' near the bottom of the clamps, the strips fitted to such recesses being shown in Fig. 2 of different widths to correspond with the widths of the recesses. The punches o are shown in Fig. 2 with heads o', and the upper recess r of suitable depth to receive the upper strip and admit the heads o' beneath the cap P. The cap is held in position upon the cross-head over the recess by cams q, pivoted upon the upper member of the cross-head, and may be removed by turning the cams to relax the pressure upon the top of the cap. The upper side of the holder is then exposed, and the strips and pins may be readily removed from the recesses within the clamps and others placed therein when desired.

In Fig. 5, C′ is a piece of sheet metal having one edge in contact with the gage C and with the holes C^2 punched therein, the sheet being withdrawn from the punches to expose such holes, which correspond exactly in their arrangement with the holes for the punches in the templets.

In order to fix the position of the templets in the holder, gage-pins t are inserted in the rabbet r, supporting the upper templet, which is applied with its end in contact with the gage-pins, as shown in Figs. 5 and 6. The end of the strip s would locate the first punch at a suitable distance from the edge of the sheet metal, and if two strips were inserted in the holder and the punches held therein by the cap P it is obvious that the punches would be prevented from displacement when the movable clamp l' was pressed upon them by turning the nuts n. If preferred, gage-pins may be inserted in both rabbets in the holder to locate both the templets positively, as shown in Figs. 5 and 6.

In case it is desired to punch the holes in the sheet metal at a different distance from the edge than that of the holes s' from the ends of the templets, the gage C may be shifted to guide the edge of the sheet metal at the required distance from the pins t. In practice we prefer to arrange the holes in the templets at such distance from the end that the gage may be set in a line with the gage-pins t, as shown in the drawings, so as to guide the edge of the sheet metal in a line with the ends of the templets. A gib u is shown inserted within the movable clamp in contact with the lower part of the pins, and such strip, if made of wood, india-rubber, or other suitable yielding material, would when clamped upon the pins hold them in the required position independently of the perforated strips s, and with such construction only one perforated strip need be used in the holder, the function of such strip in that case being merely to set the pins in the desired relation to one another within the holder, and the elastic gib sufficing afterward to sustain them in their adjusted relations.

It is obvious that, instead of pointed punches adapted only to prick the metal, perforating-punches may be used, and dies may be adjusted upon the bed beneath them, so as to constitute a perforating-machine.

Although we have claimed our particular construction for the holder adapted to operate as a clamp upon the pins when adjusted, it is obviously immaterial what form of holder be used, provided the strip s be employed, with perforations adapted to locate the punches at the desired points. By our construction any variation whatever may be made in the distances of the several pins, and the pins may be located in a straight line along the strip, as shown in Fig. 4.

Heretofore in Patent No. 343,180, dated June 8, 1886, a holder has been constructed with several series of holes side by side to afford the means of setting the punches at a variety of distances; but with such construction the required adjustment is only secured by arranging the punches in a tortuous line. The pins in our construction, as shown in Fig. 3, would be arranged in a straight line and would prick or perforate a row of holes in a straight line. It is obvious that the determination of the distances between the holes for the purpose of setting the punches may be made directly upon the strip of sheet metal s, which would be used in the machine to set the punches, and the operation of such strip would suffice for the adjustment of the punches in the required relations without any further consideration on the part of the operator.

We are aware that it is not new to apply a punch-holding bar having perforations fitted to and adapted to receive suitable punches to a reciprocating cross-head having a rabbet at its foot and a divided clamp bolted to such rabbet for holding the said punch-holding bar in place, and we hereby disclaim such construction. Our invention differs from the said construction in having a perforated strip of sheet metal for setting the pins and in having the clamps $l\ l'$ formed with jaws on their lower edges to press directly upon the bodies of the pins thus located by the sheet-metal strip in order to clamp them in place.

Having thus set forth our invention, what we claim herein is—

1. The combination, with the reciprocating cross-head, of a holder provided with a longitudinal recess, a strip of sheet metal fitted loosely to such recess and provided with holes at the required intervals, punches inserted in the holes, and jaws upon the holder to clamp the punches rigidly in place, substantially as shown and described.

2. The combination, with the reciprocating cross-head, of a strip of sheet metal and punches fitted in holes in the same, and a holder provided with a recess to receive the strip of sheet metal and with a clamp having a facing of elastic material to press upon the punches, substantially as shown and described.

3. In a perforating-machine, the combination, with a reciprocating cross-head, of a holder

formed of the clamps *l l'*, a recess within the clamps to receive a strip of sheet metal and punches fitted to holes in the same, nuts *n*, for pressing the clamps together, and a removable cap, as P, to hold the punches and strip within the recess, as and for the purpose set forth.

4. In a perforating machine, the combination, with a bed and a gage to guide the sheet metal when laid thereon, of a reciprocating cross-head carrying a holder, a recess within the holder, a strip of sheet metal fitted to such recess, gage-pins in the recess to set the end of the strip, and holes in the strip to receive and adjust the punches, as and for the purpose set forth.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

JAMES WHITE.
ANSON O. KITTREDGE.

Witnesses:
RICHARD J. SLANDORFF,
FRANK M. LEAVITT.