# M. J. Montgomery,

## Metal Punch,

No. 54,580. Patented May. 8, 1866.

Fig. 2.

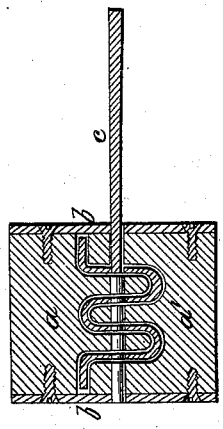



Fig. 1.

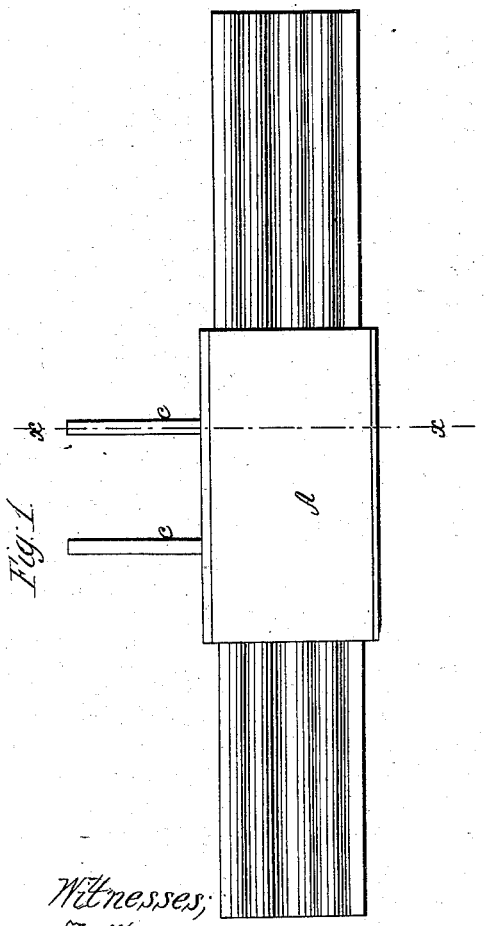



Fig. 3.

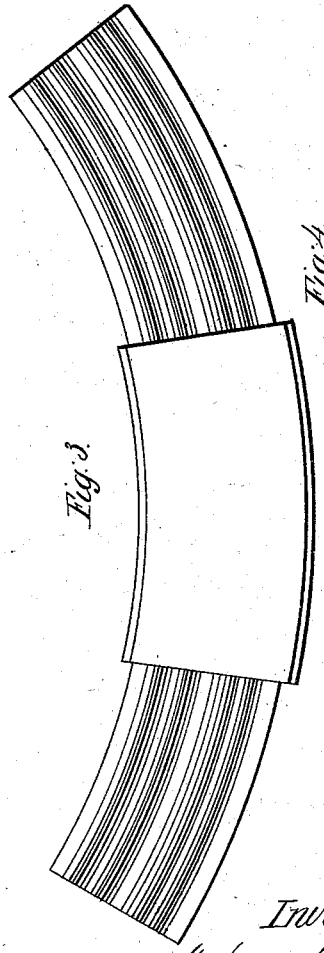
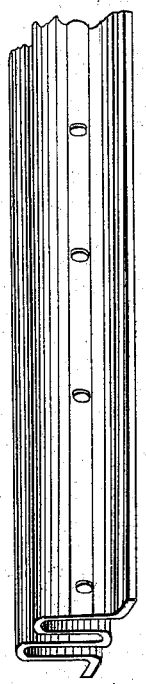


Fig. 4.



Witnesses;
H. King
Richard Montgomery

Inventor;
M. Jane, e Montgomery

# UNITED STATES PATENT OFFICE.

MARY JANE MONTGOMERY, OF NEW YORK, N. Y.

## IMPROVED APPARATUS FOR PUNCHING CORRUGATED METALS.

Specification forming part of Letters Patent No. **54,580**, dated May 8, 1866.

*To all whom it may concern:*

Be it known that I, MARY JANE MONTGOMERY, of the city, county, and State of New York, have invented a new and useful Apparatus for Punching Bolt or Rivet Holes in Corrugated or Curved Metals; and I do hereby declare the following to be a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Much difficulty is well known to exist in making bolt or rivet holes by any of the ordinary or commonly-used processes in corrugated or curved metallic sheets, plates, or beams when the holes are required to be made through the curve or corrugations and transverse to the line of the curve or corrugations.

The object of my invention is to enable the operator or workman to do this with as much facility and certainty in the line of direction of the holes as if he were operating upon a plain or flat sheet or plate of the same metal.

In the drawings forming a part of this specification and hereto attached, Figure I shows the tool I use with a portion of a straight corrugated beam-iron passed through it. Fig. II is a section of this tool through the line $x\ x$ of Fig. I. Fig. III shows the tool applied to a curved corrugated beam or sheet, and Fig. IV a portion of the beam or sheet with the holes punched therein.

In all these figures the same letter refers to the same part.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and mode of operation.

The tool A, Fig. I, is made in two sections, $a\ a'$, as seen in Fig. II, with undulating surfaces adapted to the corrugations or curved surfaces of the sheet or beam, and with an interval between their faces corresponding to the thickness of the said sheet or beam. These two sections are adjusted to each other at this distance, and held in place by means of a plate on each side, (marked $b\ b$,) Fig. II. Through these plates and the interlocking waved surfaces of the two sections $a\ a'$ a straight hole is made to receive the punch or punches $c\ c$.

In using the apparatus or tool, the curved or corrugated sheet or beam is passed into the space between the two approximating faces of $a$ and $a'$ to the distance required, and the punch or punches $c\ c$ driven through its passway from $b$ to $b$, or from one face of the tool to the other, carrying with it the plug of metal which it displaces from each one of the corrugations or curves of the interposed plate or beam. As the direction of the punch cannot diverge from that given it by the hole in which it moves, it is evident that the holes made in the sheet or beam must exactly correspond with each other in all their curves or corrugations, as shown in the side of one of them in Fig. IV. When it is necessary to punch holes in two beams or sheets, one lapping over or into the other, the interval between the parts $a$ and $a'$, as shown in Figs. II, must be increased sufficiently to receive these together.

It may be necessary sometimes to apply this apparatus to curved beams or sheets, as shown in Fig. III. If this curvature be uniform from one end of the beam or sheet to the other, then its curvature will have to be made the same; but if the beam or sheet be curved at only one place and the rest straight, or nearly so, then, to enable the tool to pass over the whole length, its outer ends must be made with a flaring mouth, and the orifice for the punch at that point where the surfaces of the tool and the beam are in contact.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

The apparatus for punching bolt or rivet holes in corrugated or curved metals, constructed and operating substantially as described.

M. JANE MONTGOMERY.

Witnesses:

H. KING,

RICHARD MONTGOMERY.