

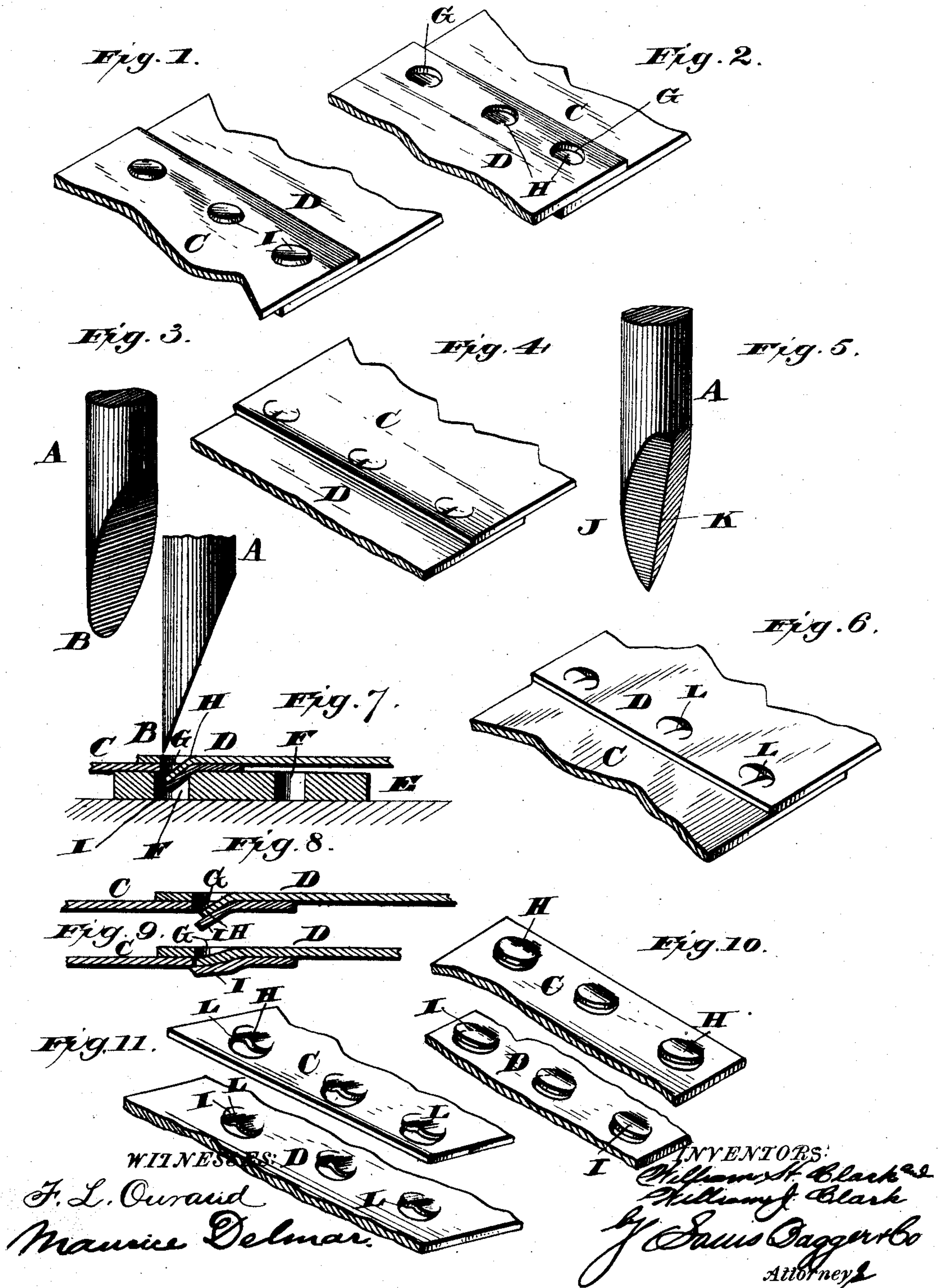
(No Model.)

W. H. & W. J. CLARK.

METHOD OF UNITING THE EDGES OF SHEET METAL.

No. 430,000.

Patented June 10, 1890.



UNITED STATES PATENT OFFICE.

WILLIAM H. CLARK AND WILLIAM J. CLARK, OF SALEM, OHIO.

METHOD OF UNITING THE EDGES OF SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 430,000, dated June 10, 1890.

Application filed February 8, 1890. Serial No. 339,690. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. CLARK and WILLIAM J. CLARK, both residents of Salem, in the county of Columbiana and State of Ohio, have invented certain new and useful Improvements in the Method of Uniting the Edges of Sheet Metal; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective view showing the obverse side of two pieces of sheet metal, the edges of which are united according to our improved method. Fig. 2 is a similar view of the same parts as these appear from the opposite or reverse side. Fig. 3 is an enlarged perspective view of the punch which we employ in producing the joint illustrated in the preceding two figures. Fig. 4 is a perspective view of a seam or joint, illustrating a slightly-modified form of the same. Fig. 5 is an enlarged perspective view of the punch or tool which we employ in producing the joint shown in the last-named figure. Fig. 6 shows the joint represented in Fig. 4 as it appears from the opposite or reverse side. Fig. 7 is a view showing the method of using the punch in the formation of the joint. Fig. 8 is a sectional view through the joint as it appears after punching, but before completing and finishing by hammering or pressing the same. Fig. 9 is a similar view of the joint as it appears in a complete and finished form after hammering down or pressing the seam. Fig. 10 is a perspective view of the two parts shown united in Figs. 1 and 2 as these would appear if separated, and Fig. 11 is a similar view of the seam or joint illustrated in Figs. 4 and 6 as it would appear if the two parts were torn apart or separated from each other.

Like letters of reference denote corresponding parts in all the figures.

Our invention relates to means for uniting the edges of sheet metal in a simple, expeditious, and inexpensive manner, which shall be sufficiently strong and durable for all ordinary purposes not requiring riveting, and

may therefore be employed advantageously in the manufacture of sheet-metal ware of many kinds, such as elevator-buckets, grain-measures, culinary utensils, and for many other purposes which will readily suggest themselves.

In carrying out our invention we employ a punch consisting of a round bar A, of steel, having its lower end cut off obliquely to form a chisel-shaped point B, the oblique side of which is flat, presenting an ellipse in outline, while the opposite side is round. The two pieces or sides of the metal to be united (shown, respectively, at C and D) are overlapped upon each other, and then placed upon a die or anvil E, having one or more circular holes or recesses F, corresponding in dimensions to the point of the punch A. While the parts C and D are in this overlapped position upon the die block or anvil, the punch is placed with its cutting-point against the uppermost piece of metal, and by a sharp blow upon the punch the two overlapping pieces of metal are both cut through partially and simultaneously, forming a D-shaped cut, as shown at G, and at the same time forcing the tongues H and I, formed by this cut, partially down into the recess F in the underlying block or anvil. In the punching of these tongues H and I the metal forming the same is stretched or expanded slightly by the pressure of the punch in striking them up—that is to say, these tongues or lips when struck up by the punch will be of slightly-larger dimensions than the holes from which they are cut, so that when the seam is flattened and finished by hammering the expanded tongues down over and upon the holes from which they have been cut the tongues cannot enter or pass through said holes, and it follows that the two edges will be firmly united. In this complete and finished form the joint or seam will present the appearance shown in Figs. 1, 2, and 9.

If desired, the form of the punching-tool may be slightly modified by constructing its point in a wedge shape, as shown at J in Fig. 5, forming a straight cutting-rib K, which by cutting into the middle of the tongue formed by punching will make a cut or indentation in the same, as illustrated at L in Figs. 6 and 11, thereby flaring or still farther expanding

the tongue in such a manner that it cannot again pass through the hole from which it has been cut. This last-named construction of the joint will be found advantageous in jointing thin sheet metal where the metal is so thin that it cannot readily be expanded sufficiently by merely reducing its thickness. Where heavy sheets are to be joined together, this indentation or expanding cut L is not required, because the metal in itself then possesses sufficient thickness and body to enable the holding lips or tongues H and I to become flattened and spread out or expanded in such a manner as to increase their area to such an extent that they cannot re-enter the apertures from which they have been cut, and through which they are forced in cutting.

It is obvious that instead of joining together or uniting only two overlapping parts of sheet metal three or more layers may be united in the same manner, and the joint completed by hammering or pressing the seam down in such a manner as to flatten the expanded holding lips or tongues H and I down upon each other and against the seam, so as to form a comparatively smooth, even, and well-finished joint or seam.

If it is desired to make the seam absolutely water-tight, this may be accomplished by soldering the seam along the edge, the solder in that case not operating so much to unite the parts as to make the joint or seam perfectly air and water tight.

If desired, the lips or tongues by which the joint is formed may be cut and pressed to-

gether after cutting by machinery instead of by hand, said machinery comprising a series of punches operating in conjunction with a recessed bed or anvil, substantially in the same manner hereinbefore set forth.

Having thus described our invention, we claim and desire to secure by Letters Patent of the United States—

The hereinbefore-described method or process of uniting the edges of sheet metal, which consists in the following steps: first, overlapping the edges of the metal to be joined; secondly, punching the overlapped edges by a suitable tool to form D-shaped lips or tongues, and during this process of punching forcing said tongues together and in a downward direction through the apertures formed in cutting or punching them; thirdly, and simultaneously with the punching, expanding the metal of said tongues, and, lastly, further expanding said tongues and simultaneously therewith flattening them down upon the seam by hammering or pressure, thereby forming a complete and finished joint, substantially in the manner and for the purpose herein set forth.

In testimony that we claim the foregoing as our own we have hereunto affixed our signatures in presence of two witnesses.

WILLIAM H. CLARK.
WILLIAM J. CLARK.

Witnesses:

W. W. HOLE,
IDA A. CLARK.