(No Model.)

T. J. HICKEY.

TOOL FOR WORKING SHEET METAL.

No. 428,811. Patented May 27, 1890.

Fig 1.

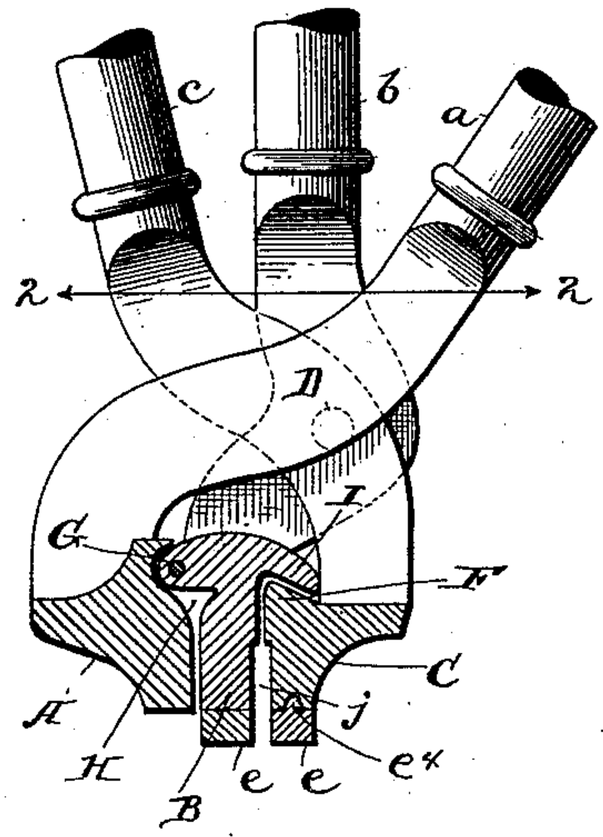


Fig 3.

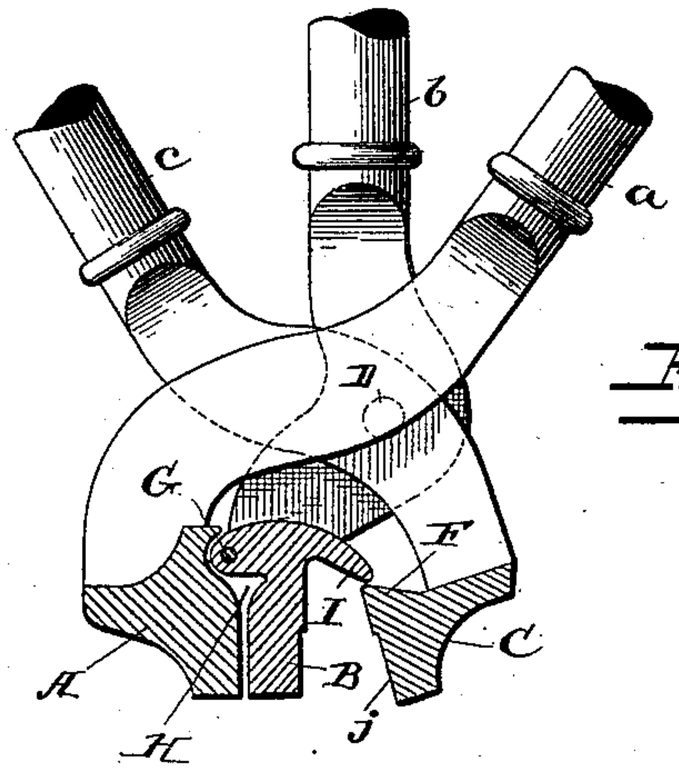


Fig 2.

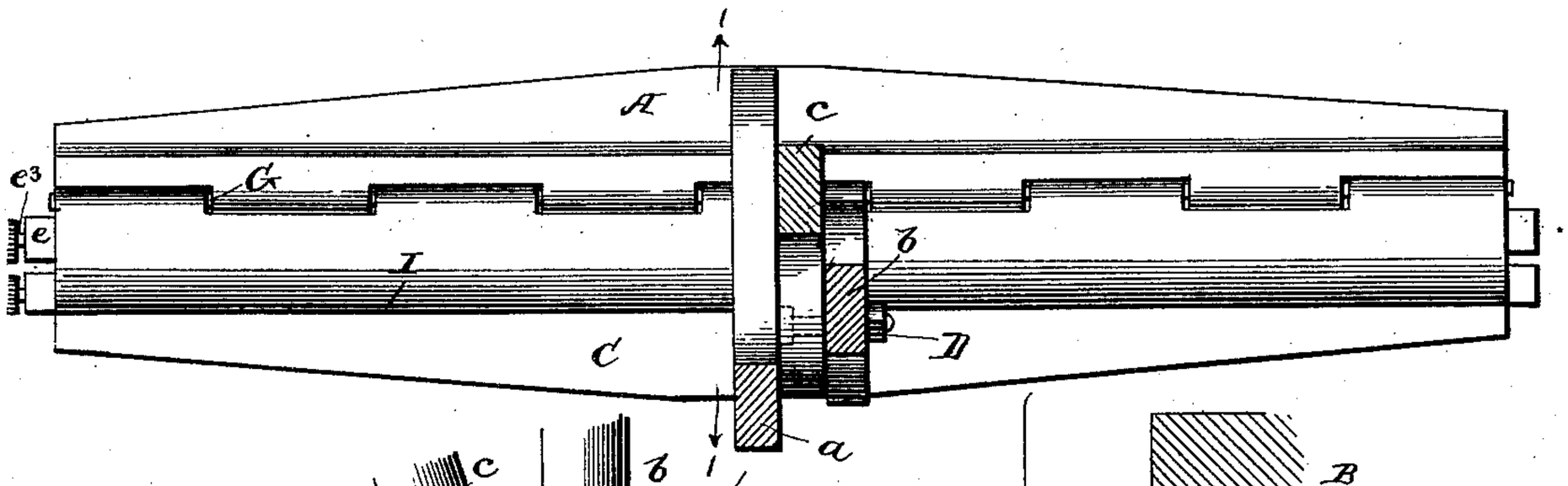


Fig 4.

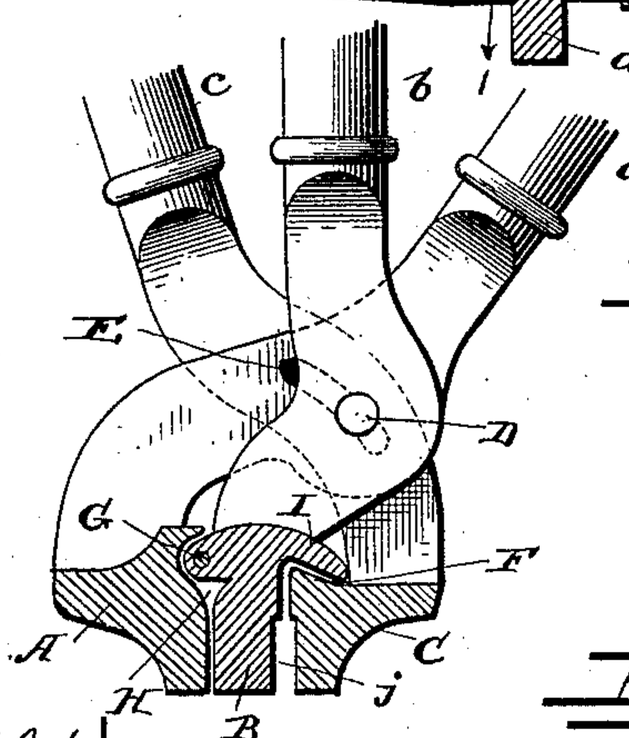


Fig 5.

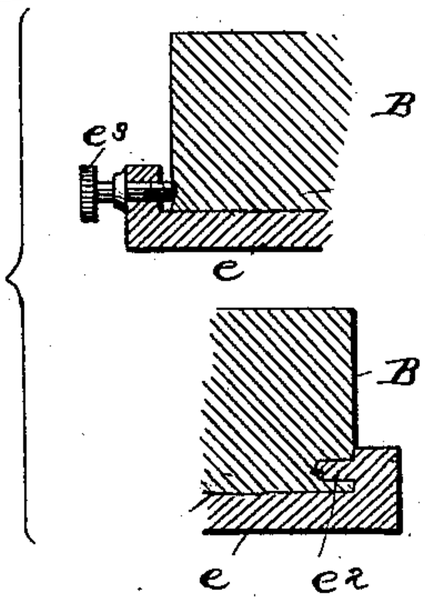
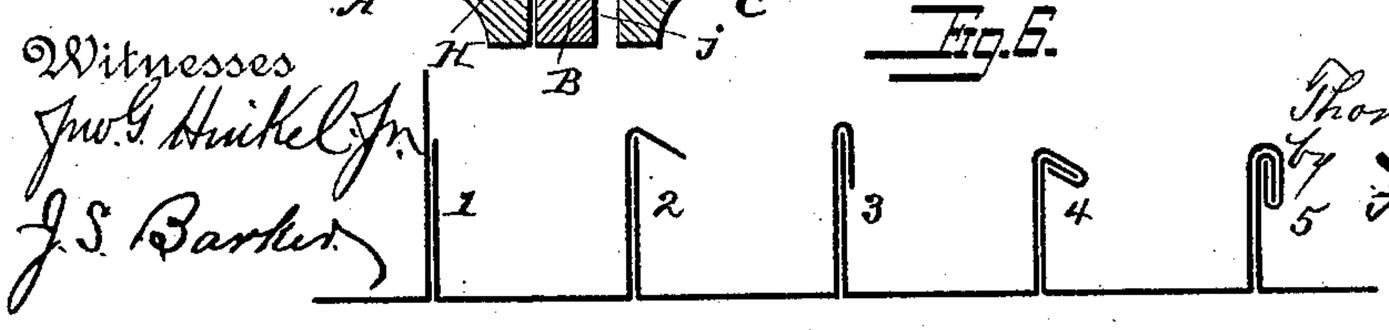


Fig 6.



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UNITED STATES PATENT OFFICE.

THOMAS J. HICKEY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO JOHN M. KENNEDY, JR., OF SAME PLACE.

TOOL FOR WORKING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 428,811, dated May 27, 1890.

Application filed December 24, 1887. Serial No. 258,862. (No model.)

To all whom it may concern:

Be it known that I, THOMAS J. HICKEY, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Tools for Working Sheet Metal, of which the following is a specification.

This invention relates to tools for seaming and uniting sheets of metal, and commonly known as "groovers' or tinners' tongs," such tools being commonly employed in metal-roofing to unite the edges of the adjacent sheets of metal.

The steps ordinarily followed in such work, and which are followed by the use of my invention, are illustrated in Figure 6, wherein 1 indicates two sheets of metal placed side by side with their adjacent edges turned up to form flanges, one being higher than the other, as shown. The next step in the process of uniting these two sheets of metal is represented at 2, where the longer flange is turned or bent over the short one at an acute angle, which turned-over edge is next folded down by the side of the shorter flange, as illustrated at 3. The two flanges thus folded together are at the next step bent over at an acute angle, as seen at 4, when the joint or seam is completed by bending the flanges together, as at 5. In following these steps one difficulty which has frequently been experienced is that the tin or other sheet metal is cracked or broken along the line of the fold when being bent by reason of the tools employed being so constructed as to cause the turned-over part of the flange to assume a sharp angle relatively to the other part thereof.

It is one of the purposes of my invention to overcome this objection; and it consists of a novel construction of parts whereby this as well as other advantages to be hereinafter pointed out are attained.

In the drawings, Fig. 1 is a transverse section on the line 1 1, Fig. 2. Fig. 2 is a top plan view of the tool, the handles being in section on the line 2 2, Fig. 1. Fig. 3 is a transverse sectional view, the elevating-strips being removed and the jaws open. Fig. 4 is a sectional view illustrating a modification. Fig. 5 is a detached view showing the method of securing the elevating-strips to the jaws. Fig. 6 represents the successive steps followed in using the tool.

The tool consists of three jaws A B C, to which are respectively connected the operating-handles *a b c*. These may be of any desired size and of any suitable material. The three handles or operating-levers *a b c* are flattened near their lower ends and lie side by side, the two *b c* being united by a bolt D passing through them. The arm *a* does not pivot about bolt D, but around a rod or bolt G, uniting the jaws A B, the flattened portion of said arm *a* preferably lying close by the side of the arms *b* and *c*, so that the three handles may be conveniently grasped. It will thus be seen that the jaws A and C may be moved independently of each other both toward or from the middle jaw B.

e e are elevating-strips, of any required thickness, adapted to be attached to the lower faces of jaws B and C to increase the depth of such jaws, they being employed when the bends 2 and 3, Fig. 6, are being made. These elevating-strips may be secured to the jaws in different ways; but I prefer that shown in Fig. 5, where the strip is shown as provided with upturned ends, one of which has an inward-projecting pin e^2, adapted to enter a recess formed therefor in the end face of the jaw, into which it is drawn and held by the set-screw e^3, seated in the opposite upturned end of the strip and bearing against the end of the jaw.

e^4 e^4 are pins or other equivalent interlocking projections, which may be carried by the strip and engage with the lower edge of the jaw, serving to preserve the proper alignment of the two.

The upper inner corner of jaw C is extended into a projection F, having a curved face which is overhung by a flange or lip I, carried by the middle jaw B.

H is a recess formed at the upper inner junction of jaws A B, one method of forming it being, as shown, by beveling off the upper inner face of jaw A and grooving jaw B adjacent thereto. The lower portions of the jaws B C are rabbeted, as seen at *j*, Figs. 1, 3, and

4. This is done for the reason that it is not necessary and is even undesirable that the flanges of the sheet metal should be drawn or pinched very close together along the line of their union with the plates from which they rise, as thereby danger of breakage or cracking is reduced.

The method of using the tool described may now be understood. Two sheets of tin, properly flanged, are brought together into the position 1, Fig. 6, and the upturned flanges are forced between the jaws B C, which at this stage of the process are provided with elevating strips or ribs *e* of such thickness as to make the distance from the lower face of the strip to the upper edge of the projection F of jaw C about equal to the height of the shorter flange. As these jaws are brought together, the projection F and lip I conjointly act to turn or lap the portion of the longer flange extending beyond the shorter one over the end of the short flange, as seen at 2, Fig. 6. It will be seen that the shape of projection F and the groove formed by rib or lip I is such that the bend given thereby to the flange is not sharp and angular, as has heretofore been customary, but is gradual and curved. The advantage incident to this part of my invention is that there is much less danger of the metal being cracked or broken along the bend or fold, as will be readily understood. The bend 2 having been thus made by jaws B C, the sheet-metal seam is next compressed between jaws A B, which fold the flanges together, as shown at 3, Fig. 6. The longitudinal recess H between these two jaws insures that the bend of the turned-over flange shall be free and shall not be compressed so as to tend to crack or break it, and preserves the advantages incident to the construction of the jaws B C. To form the second series of folds 4 5, the same operations are followed, the strips or blocks *e e*, however, being first removed—that is, the flanges folded together, as at 3, are together bent into the position 4 by the jaws B C, and are then pressed or folded together, as at 5, by jaws A B. In both these last bendings or foldings the tendency to crack or break the sheet metal by making sharp angular bends is avoided in the same manner as when bends 2 3 are being made.

It will be seen that all the operations from 2 to 5, Fig. 6, may be performed by the single tool described, and that in a more satisfactory manner than has been heretofore attainable. The levers being all mounted close together enables the tool to be easily and rapidly operated, as both sets of levers may be grasped without the operator having to change his position, thus tending to rapidity and accuracy of movement and simplicity and compactness in construction.

By pivoting or hinging the two jaws A and B directly together along their upper edges, as at G, great leverage is obtained for making the folds 3 and 5.

I am aware that it is not new in a seaming-tool having three jaws to pivotally unite two of them by a bolt passing through their handles and to pivot the third jaw to the upper outer edge of the middle one and operate the same by a foot lever or treadle; but it is often, especially upon slanting roofs or in very windy weather, dangerous or even impossible for the operator to use his foot for this purpose, and by my invention I avoid this objection, besides securing longer leverage.

In Fig. 4 I have shown a form of my invention wherein the operating-levers are arranged somewhat differently from what they are in the construction shown in the other figures. In this arrangement the flattened portion of the hand-lever *a* lies between the two other handles, and is provided with a curved slot E, concentric with the pin or rod G, so that the hand-lever may move freely independently of the pivot-bolt D, which extends through this slot.

It will be understood that those parts of my invention relating to the construction of the jaws by which the sheet-metal flanges or edges are so bent as to avoid breaking or cracking are equally applicable to tools having but a single pair of jaws.

Without limiting myself to the precise construction and arrangement of parts shown and described, I claim—

1. In combination with a tool for seaming metal sheets having pivoted jaws, the removable strips *e*, having upturned ends, one provided with a pin e^2, adapted to enter a recess in the end of the jaw, and the other with a set-screw e^3, substantially as described.

2. In a tool for seaming sheet metal, the combination of three jaws A B C, three operating-handles connected, respectively, therewith, a bolt D, pivotally connecting the handles of jaws B and C, and a pivot rod or bolt connecting jaw A to jaw B, the handle of jaw A lying between those of the other jaws and provided with a slot concentric with its pivot G, through which passes the bolt D, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS J. HICKEY.

Witnesses:
WM. S. DARLINGTON,
N. C. LANE.