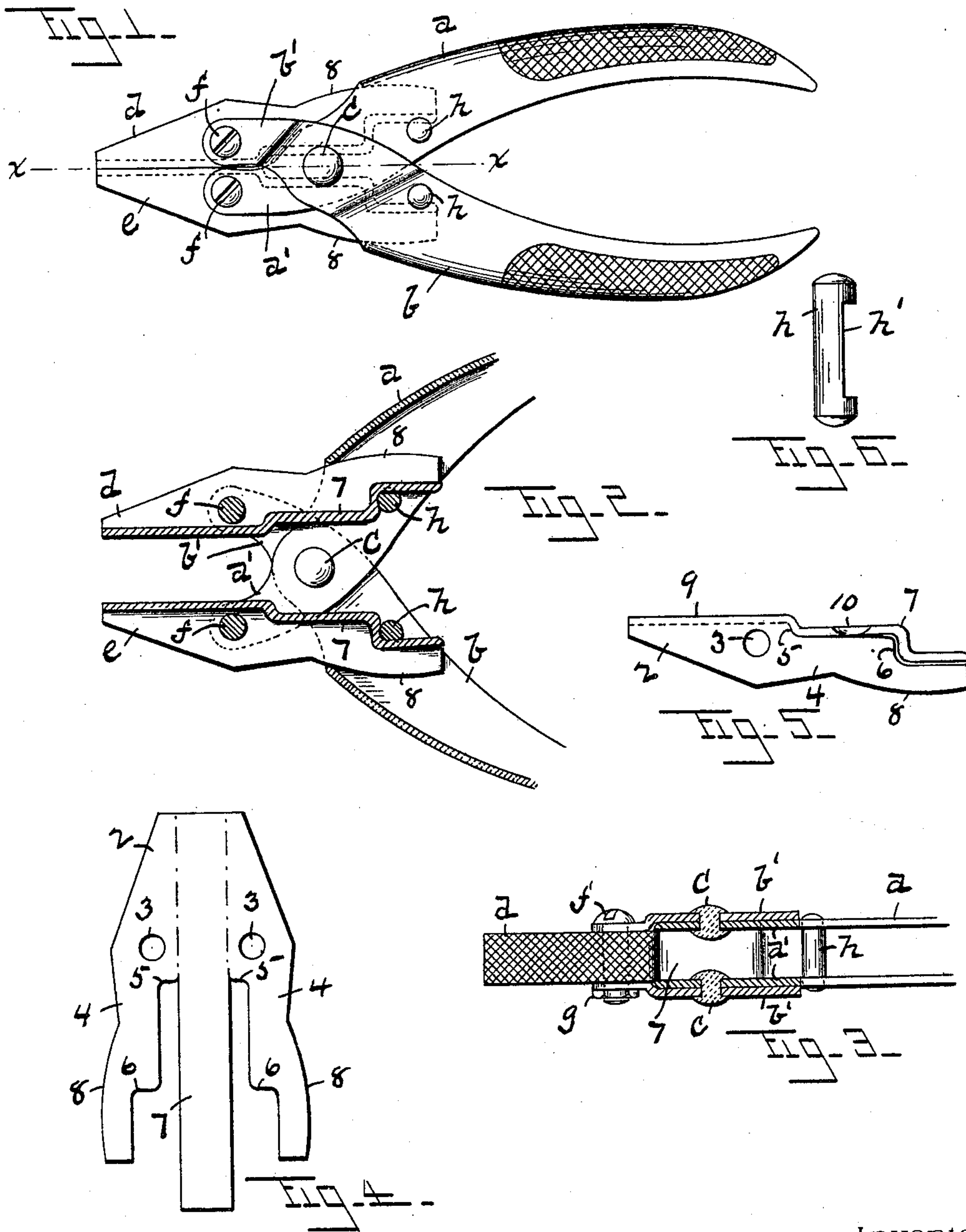


(No Model.)

W. M. MORTON.
PLIERS.

No. 583,215.

Patented May 25, 1897.



Witnesses.

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PLIERS.

SPECIFICATION forming part of Letters Patent No. 583,215, dated May 25, 1897.

Application filed September 10, 1896. Serial No. 605,370. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. MORTON, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Pliers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to that class of pliers and similar tools, comprising two gripping-jaws and handle-levers for moving them toward and away from each other, in which the jaws maintain a true parallelism to each other throughout their movement; and it has for its object to provide a tool of this nature in which both the jaws and the handle-levers are or may be formed from sheet metal which will have an enlarged central throat between the jaws when separated to receive a rod or other device thrust longitudinally between them and which will be provided with means for automatically compensating for wear of its pivot-joints and other contacting surfaces.

To these ends my invention consists in the tool constructed and operating as hereinafter fully described, and particularly pointed out in the claims.

Referring to the drawings, in which like characters designate like parts in the several views, Figure 1 is a side view of a tool embodying my invention with the gripping-jaws in their closed position. Fig. 2 is a partial longitudinal section thereof with the jaws in their extreme open position. Fig. 3 is a partial longitudinal section taken at line *x x* of Fig. 1 and at a right angle to the section shown in Fig. 2. Fig. 4 shows the blank of sheet metal from which each of the jaws is formed. Fig. 5 is a side view of a jaw formed from said blank. Fig. 6 is a detail view of one of the rocking fulcrums against which the jaws bear.

The letters *a* and *b* designate the two handle-levers, which are formed up from sheet metal into concavo-convex shape in cross-section and terminate at their front end in the flattened parallel fingers *a' b'*, through which pass the rivets *c c* in alinement with each other, which rivets form the pivotal center for said levers and at the same time leave a clear space between the fingers *a' b'*, as is common in this class of tools.

The letters *d* and *e* designate the two gripping-jaws, which are each formed from a sheet-metal blank, (shown in Fig. 4,) said blank having the head 2, containing the holes 3 3, and having a portion of its stock removed at its opposite end to form the arms 4 4, internal shoulders 5 6, and intermediate strip 7. At their outer side the arms 4 4 are provided with the curved portion 8 for a purpose which will presently appear. Said blank is bent in the planes indicated by broken lines to cause the two arms 4 4 to stand parallel with each other and at a right angle to the strip 7, as shown in Fig. 5, and the strip 7 is bent transversely to cause it to conform to the shoulders 5 6, but is left with its free end slightly separated from the adjacent edge of the arms, as shown, to cause it to act as a leaf-spring. The acting face 9 of the jaw thus formed is preferably checked, as shown in Fig. 3, or otherwise roughened, as usual.

The jaws *d e* are connected to the fingers *a' b'* of the handle-levers *a b* at the outer ends of said fingers by the screw-bolts *f*, which pass through holes in said fingers and through the holes 3 3 of the jaws and receive nuts *g* at their opposite end.

The arms 4 of each jaw project within the front end of the handle-lever opposite to the one upon which it is pivotally hung, and the outer curved surfaces 8 of said arms bear against the inner edge of said handle-lever at the base of the fingers *a'* or *b'* thereof, as the case may be, as shown in Fig. 2, said contacting surfaces being held in constant engagement with each other by swivel-pins *h*, seated in the handle-levers and having the central flattened portion *h'*, (see Fig. 6,) which bear against the faces of the spring-strips 7 at the rear of the shoulders 6 of said arms. The curvature of the surfaces 8 of the arms 4 is such that as the jaws move from their extreme open position (shown in Fig. 2) to their closed position, (shown in Fig. 1,) and vice versa, their acting faces 9 are maintained in a truly parallel relation to each other. The strip 7 has each of its side edges provided with a notch or recess 10 (see Fig. 5) to receive the edges of the inner heads of the rivets *c c* in the closed position of the jaws.

By reason of the fact that both the jaws and the handle-levers of the tool thus constructed are made from sheet metal the tool can be

manufactured at a comparatively small cost, and inasmuch as the arms 4 4 of the jaws are guided for their movement at their side edges instead of being slotted for such purpose a
 5 sufficient amount of stock is left in said arms to give ample strength and rigidity to the jaws. I thus secure a light but very strong and durable tool.

By providing the arms 4 4 of the jaws with
 10 the shoulders 5 and 6 and guiding said arms, as described, I secure an increased amount of clear space between the jaws when open to receive a bolt, rod, or other device thrust between them, a matter of much importance in
 15 the use of this class of tools. Attention is also called to the fact that the fulcrum-pins *h* being swiveled and the bearing-surface between them and the arms of the jaws being distributed over the entire area of their flattened
 20 sides *h'* the liability of reduction of said contacting surfaces by wear is very much less than would be the case if a round and rigid fulcrum-pin were employed. At the same time the spring action of the strip 7 is such as to
 25 automatically compensate for any wear between said surfaces or between the opposite edges of the arms 4 and the backs of the handle-levers, so that no looseness between the jaws and the handle-levers can develop, how-
 30 ever long the tool may be used.

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

1. The combination with a pair of bifur-
 35 cated handle-levers composed of sheet metal, the forked ends of said levers crossing each other and being connected to each other by independent pivots located in the same axial line, of two jaws also composed of sheet metal
 40 pivotally connected to said handle-levers respectively at the front end of the latter, each

of said jaws being provided with a rearwardly-extending arm having an outer curved side which bears against the inner side of the handle-lever opposite to the one upon which the
 45 jaw is supported and having a flat inner side, said handle-levers being provided with swiveled pins having a flattened side which bears against the said flat sides of said arms respectively, substantially as and for the purpose
 50 described.

2. The combination with the pair of handle-levers provided with fulcrum-pins as described, of the jaws pivotally connected to
 55 said levers at the front end of the latter, each of said jaws being provided with a rearwardly-extending arm having a curved outer side which bears against the inner side of the handle-lever opposite to the one upon which it is
 60 pivoted and having upon its opposite side a flat spring member which bears against the fulcrum-pin on said lever, substantially as and for the purpose described.

3. The combination with the handle-levers *a b* united by the independent rivets *c c* and
 65 provided with the swiveled fulcrum-pins *h h* disposed as described, of the jaws *d e* pivoted to the front ends of said levers, said jaws being provided with the rearwardly-extending
 70 arms 4 having the curved outer side 8 bearing against the inner side of the handle-lever opposite to the one upon which each jaw is pivoted, and having the spring-strip 7 bearing against the fulcrum-pin on said lever, arranged and operating substantially as de-
 75 scribed.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM M. MORTON.

Witnesses:

J. P. DEJON,
 GEORGE E. HALL.