

W. A. BERNARD.
PROCESS FOR FORMING SHEET METAL HANDLES.
APPLICATION FILED MAR. 20, 1907.

1,064,956.

Patented June 17, 1913.

2 SHEETS—SHEET 1.

Fig. 1



Fig. 2

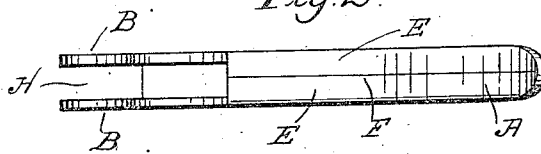


Fig. 3

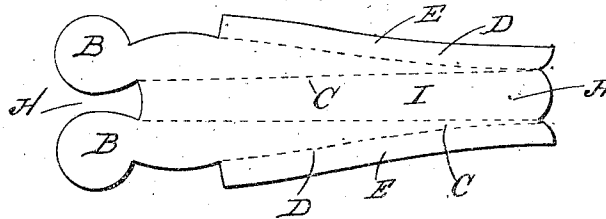


Fig. 4

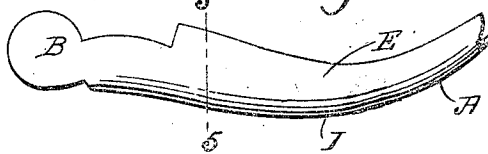
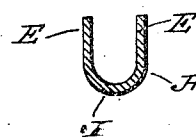


Fig. 5



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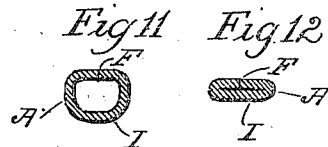
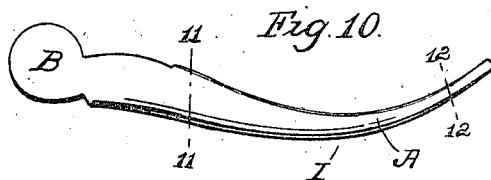
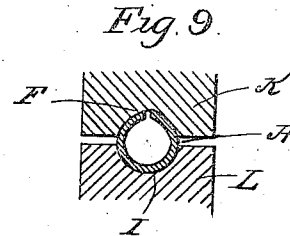
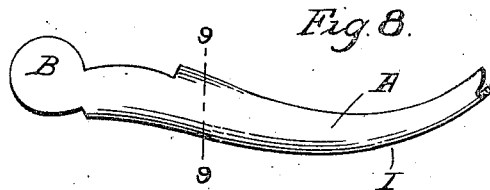
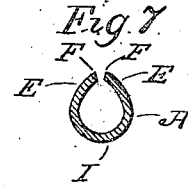
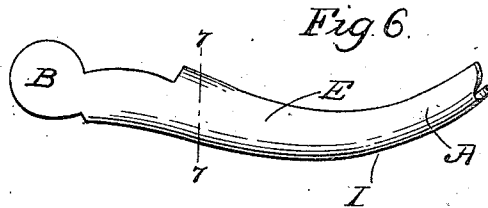
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UNITED STATES PATENT OFFICE.

WILLIAM A. BERNARD, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE WILLIAM SCHOLLHORN COMPANY, OF NEW HAVEN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

PROCESS FOR FORMING SHEET-METAL HANDLES.

1,064,956.

Specification of Letters Patent.

Patented June 17, 1913.

Application filed March 20, 1907. Serial No. 363,439.

To all whom it may concern:

Be it known that I, WILLIAM A. BERNARD, of the city and county of New Haven and State of Connecticut, have invented a new and useful Process for Forming Sheet-Metal Handles of Pliers, Punches, and Similar Tools, of which the following is a full, clear, and exact description when taken in connection with the accompanying drawings, which form a part thereof.

This invention relates to a process for forming handles of pliers, punches and similar tools of sheet metal from flat blanks. Handles for this class of tools have hitherto usually been made solid, and of cast metal, or have been made of sheet metal bent substantially U shaped in cross section. Cast metal handles, however, are heavy and brittle, while U shaped sheet metal handles are apt to be bent out of shape and their edges bruise the fingers of the operator. To avoid these objections and form a handle closed in cross section is the object of the present invention. But this type of handles is curved longitudinally, and is of variable cross sectional area throughout its length. These features have hindered the production of a hollow handle which is closed or continuous throughout its gripping surface because of the impracticability of turning the lateral edges of the handle over a mandrel or core. As the handle in its finished form has the features above referred to, it would be impracticable to remove any mandrel or core, were it possible to use one of the desired form.

The present invention consists of a process by which the use of a core or a mandrel is avoided, and the lateral edges are turned inward to the desired form without any internal support, as more fully set forth and claimed hereinafter.

Referring to the drawings, Figure 1 represents a side elevation of a finished handle formed by the process covered by this invention, Fig. 2, a bottom view of the same, Fig. 3, a plan view of the blank from which the handle is formed, Fig. 4, a side elevation of the blank after the first step of the operation, Fig. 5, a transverse vertical section on line 5—5 of Fig. 4, Fig. 6, a side elevation of the blank after the second step of the operation, Fig. 7, a transverse vertical section on line 7—7 of Fig. 6, Fig. 8, a side elevation of the blank after a further step in the

operation. Fig. 9, a transverse vertical section on line 9—9 of Fig. 8. Fig. 10, a side elevation of the blank at a later stage of the operation, and Figs. 11 and 12, transverse vertical sections on lines 11—11 and 12—12 of Fig. 10, respectively.

In all figures, similar letters of reference represent like parts.

The part designated by the letter A represents a flat piece of sheet metal blanked out to the desired form. At the forward ends are two projections B with a slot H between. By means of suitable dies, the blank is formed substantially U shaped in cross section and curved in longitudinal section, as shown more particularly in Figs. 4 and 5, the sides being curved on substantially the lines C—C of Fig. 3, the central part I forming part of the gripping portion of the handle. The forward projections B are now brought to a position substantially parallel to each other, as shown more particularly in Fig. 2 to form forwarding projecting parallel attaching plates, and the slot H forms a mortise for jaws, etc.

The blank when formed substantially U-shaped in cross-section is placed in a supporting die or anvil, the sides of which extend upward on the outer faces of the sides of the blank above the axis of the blank. The bottom of the die on which the blank is seated is rounded, but the sides of the blank are substantially parallel, and as they extend upward so far they tend to support the sides of the blank against any tendency to be forced outward over the edge of the die. In this position pressure can be exerted on the edges of the blank which will tend to force the sides outward instead of inward. The extreme lateral edge portions E—E (Fig. 7) of the gripping portion of the handle are then forced inward by suitable dies toward each other on substantially the lines D—D of Fig. 3. When in this form pressure on the extreme edges F—F of the sides E—E by a punch K will tend to force the sides of the handle outward against the supporting die L, as shown more particularly in Fig. 9. As the punch K tends to force the sides of the blank outward against the supporting die L, and as the portion within the supporting die is substantially semi-circular in cross section it supports the pressure exerted by the punch without breaking or bending inward. The edges F are thus

gradually forced downward toward each other and crowded into substantially the form shown in Figs. 11 and 12, wherein they are shown meeting on a longitudinal line.

5 In the latter figure, which is a cross section near the extreme rear of the handle, it will be seen that the lateral edges F are crowded down almost into contact with the under side of the handle.

10 By this process, the use of a mandrel or core is obviated, and the desired form is produced not by bending the edges inward over an internal support, but by bringing the edges toward each other by a pressure, the resulting direction of which is outward toward the sides of the blank. The resulting handle is one that has a closed or continuous cross section, and whose cross sectional area varies greatly. This is particularly illustrated in Figs. 11 and 12 which are on different lines of the handle shown in Fig. 10. In Fig. 12, the edges are so close to the under side of the handle that no core or mandrel could intervene, while in Fig. 11 a considerable space is shown in the interior of the handle.

It will therefore be understood from the foregoing description that in order to form a handle of the general configuration illustrated, it is necessary to cut a blank of suitable form, tapering toward one end, after which the blank is bent about its longitudinal axis and curved longitudinally, in order to form a handle back which is curved both longitudinally and transversely. The bending of the blank about its longitudinal axis into substantially U shaped cross-section will provide bent-up side walls which are substantially shorter or narrower at the narrow end of the blank than they are toward the opposite end of the same. After the blank has been bent into U shaped cross-section, lateral edge portions of substantially the same width throughout that portion of the handle which is to be of closed cross-section, are pressed toward each other and toward the rear or outer wall of the blank until such edge portions meet each other and form a continuous (and prefer-

ably flat) surface at the inside of the handle, those lateral edge portions at the narrow end of the blank being bent substantially into contact, or at least into close proximity to, the outer or rear wall of the handle thus formed.

In bending inward the lateral edge portions of the curved blank, such edge portions are not bent on a curve corresponding to the anvil or die bottom, but on the other hand, are bent inwardly on a curve corresponding approximately to the curve defined by such edges when the blank is first curved in lengthwise direction, as will be seen by a comparison of Figs. 6 and 10.

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

The method of forming longitudinally curved sheet metal handles of a closed cross-section which decreases in area from one end of the handle to the other, which comprises cutting a sheet metal blank of suitable tapering form, bending such blank about its longitudinal axis into substantially U-shaped cross section and curving it longitudinally to give the necessary longitudinal curve to the handle, supporting the U-shaped blank thus formed in a die or anvil to prevent the spreading of the bent up sides, then engaging with a suitable tool the lateral edges of the blank and bending such edges inward without the use of a mandrel or core, on a curve diverging from the longitudinal curve of the die bottom substantially throughout that portion of the blank which is to be of closed cross-section and corresponding approximately to the curve defined by such edges immediately prior to the inward bending thereof, until such edges substantially meet each other and form a substantially continuous surface; substantially as described.

In witness whereof, I have hereunto set my hand on the 19th day of March, 1907.

W. A. BERNARD.

Witnesses:

M. OLIVE WILLIAMS,
SAMUEL H. FISHER.