(No Model.)

S. R. & F. A. WILMOT.

SEAMLESS SHEET METAL KNOB OR HANDLE.

No. 447,265. Patented Feb. 24, 1891.

Fig. 1.

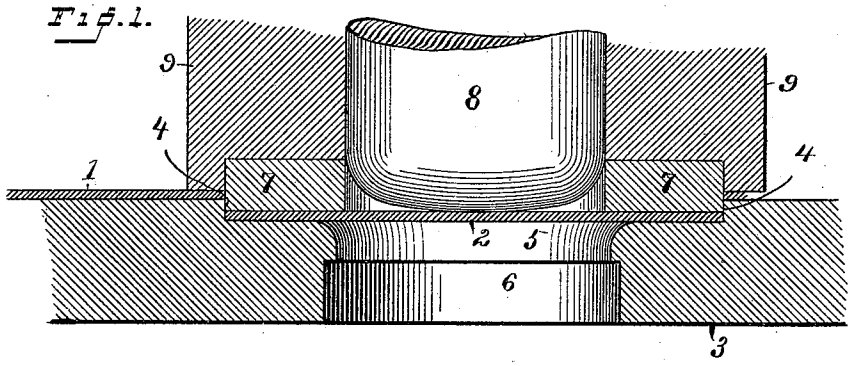


Fig. 2.

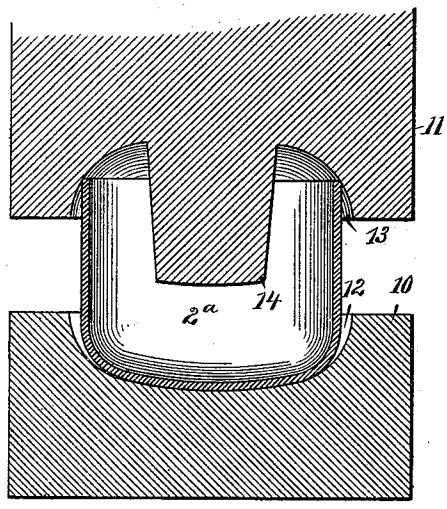


Fig. 3.

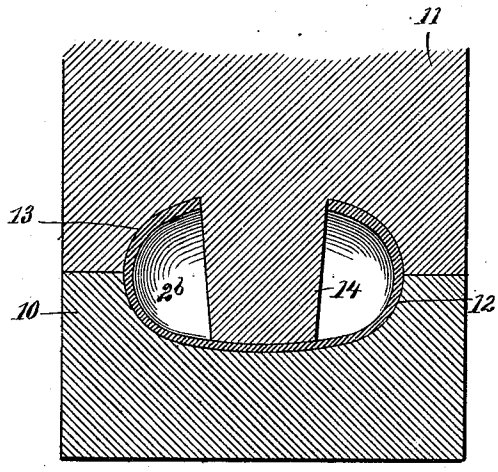
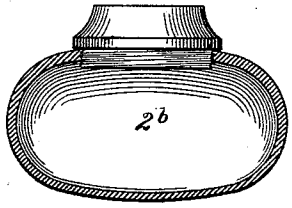


Fig. 4.



WITNESSES

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SAMUEL R. WILMOT AND FRANK A. WILMOT, OF BRIDGEPORT, CONNECTICUT.

SEAMLESS SHEET-METAL KNOB OR HANDLE.

SPECIFICATION forming part of Letters Patent No. 447,265, dated February 24, 1891.

Application filed June 30, 1890. Serial No. 357,235. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL R. WILMOT and FRANK A. WILMOT, citizens of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Seamless Sheet-Metal Knobs or Handles and Method of Making the Same; and we 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.

Our invention has for its object the production of seamless sheet-metal knobs or handles ready for attachment to a suitable shank, the knobs or handles being first drawn to cup shape from blanks and then closed in at the top ready for attachment, the blanks being preferably punched out from a strip of metal just prior to being drawn, any ordinary or preferred form of double-acting punch being used.

With this end in view we have devised the novel knob or handle and method of making the same, of which the following description, in connection with the accompanying drawings, is a specification, numerals being used to denote the several parts.

Figure 1 is a section of a double-acting punch and the corresponding dies by which the blank is punched out from a strip of metal and then drawn to cup shape, as shown in Fig. 2. Figs. 2 and 3 are cross-sections of the closing-dies in the open and closed positions, respectively, illustrating the manner in which the cup as drawn by the first operation is closed in at the top to form the completed knob or handle; and Fig. 4 is a cross-section of a completed knob or handle, illustrating one manner in which it may be attached to a shank.

Knobs or handles made in this manner are adapted for general use where great strength is required, and are especially valuable for use in connection with builders' hardware and for tool-handles, metallic knobs of this class having heretofore been made either by casting or by joining two or more pieces of sheet metal together by lock-seams either with or without brazing. Our present method enables us to produce a knob of this class which is superior in every respect and at much less expense than has heretofore been possible. We have shown in the drawings a perfectly-smooth plain knob, although it is obvious that the knobs may be corrugated by the dies, if preferred, it being simply a matter of corrugating the dies or leaving them smooth, as we have shown in the drawings.

1 denotes a strip of sheet metal as fed to the press; 2, a blank punched therefrom from which the knob is formed; 2^a, the cup formed by the first operation, as shown in the drawings, and 2^b the completed knob or handle. In the specification we shall speak of the formation of the cup as the first operation, that being really the first operation of our novel method, it being immaterial, so far as this invention is concerned, whether the drawing-punch is supplied with blanks already formed or whether the blanks are punched out from a strip of metal and then drawn to cup shape by a double-acting punch, as shown in the drawings.

3 denotes the die-block, which is shown as provided with a recess 4, which serves as a die in punching out the blank. Concentric with recess 4 is an opening 5 through the die-block, the wall of which serves as the die in drawing the cup. The diameter of this opening at its narrowest point is slightly greater than the diameter of the punch, so as to give ample room for the metal. The upper edge of the opening is rounded, as is customary in dies of this class, to give ample room for the metal of the blank as it is drawn into and through the die. Just below the portion of the opening which serves as the drawing-die the opening is enlarged to form an abrupt shoulder 6, which serves as a stripper to remove the cup from the punch when the latter moves upward.

7 denotes the blanking-punch, and 8 the drawing-punch, which reciprocates in a central opening through the blanking-punch and the punch-block 9, by which the blanking-punch is carried. The manner in which the punches are operated forms no portion of our present invention, and is not thought to require illustration or description. The first portion of the first operation, as shown in the drawings, punches out blank 2 from the strip

of metal, or, as stated previously, blanks already formed may be fed to the drawing-punch.

Where the blanks are punched out just before they are drawn, the operation is as follows: After forming the blank the blanking-punch holds it closely at the edges, while the drawing-punch moves downward and forms the blank into cup shape, as shown in Fig. 2. In practice the blanking-punch holds the blank flat until the drawing-punch has drawn the entire blank over the rounded edge of the drawing-die, thereby preventing buckling at the edge of the blank. The blanking-punch then rises, and an instant later the drawing-punch rises, shoulder 6 acting to remove the cup therefrom.

Turning now to Figs. 2 and 3, 10 denotes the lower closing-die, and 11 the upper closing-die. Either of these may be stationary. In practice the lower die is ordinarily stationary, the movement being all made by the upper die. The lower die is provided with a recess 12, which is made just the size and shape of the outer half of a completed knob. The upper die is provided with a recess 13, which is approximately the size and shape of the inner half of the completed knob, and which is preferably provided with a central depending core 14, against which the inturned upper edge of the metal of the cup abuts to form a central opening in the knob, as clearly shown in Fig. 3. In practice the upper edge of the cup as left by the drawing-punch may require to be trimmed slightly. It will be noticed that the recesses in the closing-dies are made wider at their outer edges than the cup. This is in order that the metal of the cup may have an outward movement at the center at the same time that the inward movement of the edge of the cup takes place when the dies close together. In practice we preferably leave the cup of sufficient height, so that when the dies are closed together there will be an excess of metal if a core is used, the result being that the metal at the edge of the cup in addition to being closed tightly about the core will be upset and displaced in such a manner as to leave the metal at the inner side of the completed knob considerably thicker than the metal at the outer side, as is clearly shown in Fig. 3. The use of the core centers the opening in the knob and makes the operation of reaming out unnecessary, and by thickening the metal on the inner side of the knob greatly increases the strength at just the point where the strain comes in use. It should be understood, however, that the use of the core is not essential, as the knobs can be formed just as perfectly without the use of a core. Where a core is used to center the opening and to thicken the metal about it, it is simply necessary that the core be long enough, so that the metal of the cup will close about it. In practice, however, we preferably make the core long enough, so that when the closing-dies meet it will just come in contact on the inner side with the metal of the outer side of the die, as is clearly shown in Fig. 3, the end of the core being curved slightly to correspond with the curvature of the outer side of the knob. By lengthening the core in this manner we avoid the possibility of the metal on the outer side of the knob curving inward or dimpling when the closing-dies move together and insure that the outer face of the completed knob shall have the exact curvature of the lower die.

The manner in which the knobs are attached to the shanks, collars, or other carrying parts forms no portion of our present invention. In Fig. 4 we have shown the thickened inner side of the knob as screw-threaded to receive the thread of a shank; or, if preferred, the knobs may be attached to shanks in the manner illustrated and described in our pending application, Serial No. 357,236, of even date herewith.

Having thus described our invention, we claim—

1. The herein-described method of making knobs or handles, which consists in drawing a blank to cup shape and then closing the top of the cup inward and abutting the inner edge of the same inward against a core which forms an opening to receive a shank.

2. The combination, with a die 10, having a recess 12, substantially as described and shown, of a die 11, having a recess 13, substantially as described and shown, and at the center of said recess a downwardly-extending core 14, as and for the purpose set forth.

3. The combination, with a die 10, having a recess 12, of a die 11, having a recess 13, and a downwardly-extending core 14, concentric with said recess, the lower end of said core extending nearly to the bottom of the recess in die 10, so that in closing in the top of a sheet-metal cup the metal at the upper edge of the cup is closed about the upper edge of the core, the lower end of the core coming in contact with the metal on the inner side of the cup to prevent dimpling.

4. A seamless sheet-metal knob having an opening on its inner side and inturned edges in the same plane surrounding said opening, said knob being of a spheroidal form, so that a cross-section thereof through said opening will present a continuous curve in the metal shell thereof.

5. A seamless sheet-metal knob, said knob having an opening on its inner side, and surrounding said opening thickened inturned edges which are in the same plane and bound said opening.

In testimony whereof we affix our signatures in presence of two witnesses.

SAMUEL R. WILMOT.
FRANK A. WILMOT.

Witnesses:
A. M. WOOSTER,
ARLEY I. MUNSON.