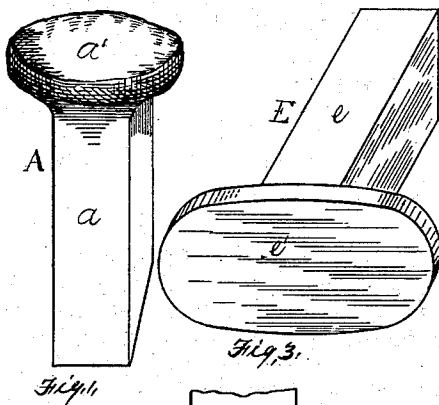
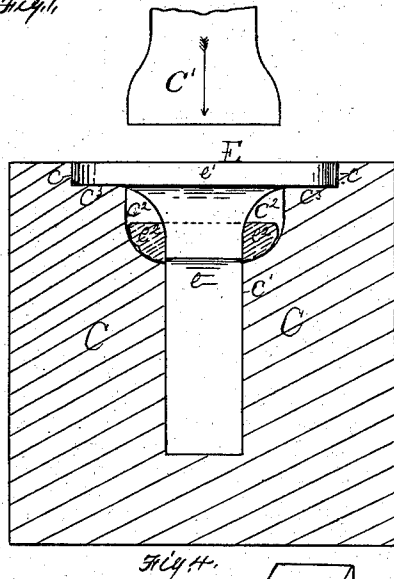
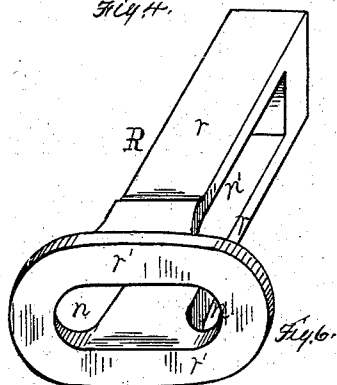
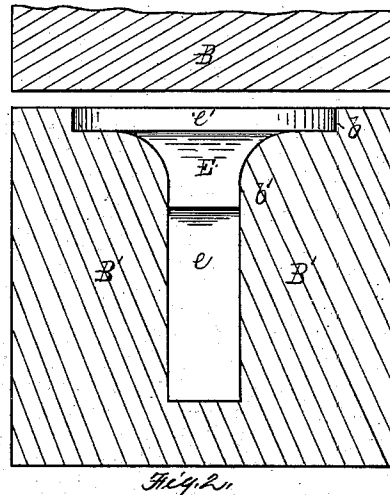
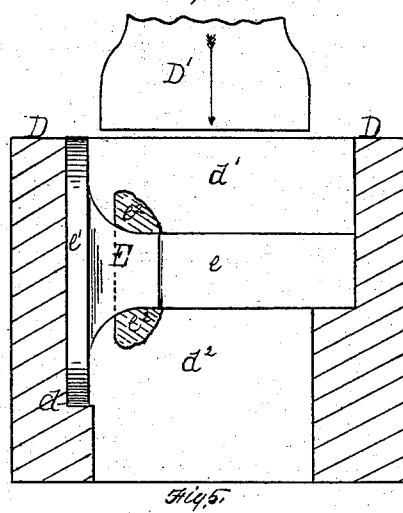
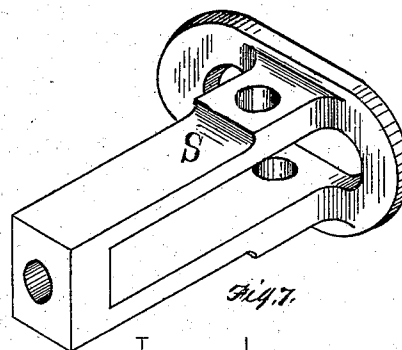


(No Model.)

J. T. WILSON.
MANUFACTURE OF DRAW BARS.

No. 267,629.

Patented Nov. 14, 1882.



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UNITED STATES PATENT OFFICE.

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MANUFACTURE OF DRAW-BARS.

SPECIFICATION forming part of Letters Patent No. 267,629, dated November 14, 1882.

Application filed April 24, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. WILSON, a citizen of the United States, residing at Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in the Manufacture of Draw-Bars; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a perspective view of a blank or piece of metal, illustrative of a preliminary step in forming the head or face plate of the draw-bar blank Fig. 6 in accordance with my invention. Fig. 2 is a sectional view of dies, with the blank in elevation, further illustrative of the operation of forming the head-plate. Fig. 3 is a perspective view of the blank as shaped by the dies, Fig. 2. Figs. 4 and 5 are similar views of punching-dies, illustrative of the manner of forming the link-opening in the draw-bar blank. Fig. 6 is a perspective view of a draw-bar blank made in accordance with my invention, and Fig. 7 is a similar view of the finished draw-bar.

My invention relates to the manufacture of wrought-iron or steel draw-bars of the class shown in Fig. 7, and, in general terms, consists in forming a blank for such draw-bars of one piece of metal by forging a bar or billet to the desired exterior form of the draw-bar, and cutting or punching out a part of the center of such piece of metal to form the link-opening, as hereinafter more fully described and claimed.

In carrying out my present invention, I reduce a suitable billet or piece of iron or steel, preferably by forging, to a form substantially such as the piece A, Fig. 1, having a body portion, *a*, equal or approximately equal in form and size to the body part *e* of the blank E, and also having on one end a lump or enlargement, *a'*, designed to form the head or face plate *e'*. Such a lump or enlargement may be formed by upsetting the end; but such manipulation breaks and injures the fiber of the metal, and thereby weakens the draw-bar made therefrom, and for this reason I prefer to form the lump by reducing or drawing down the body part *a* more than the part *a'*. In this way a sound

and continuous fiber is formed or preserved through and around the part *a'* as well as the part *a*. In order to give this enlargement *a'* a plate form corresponding exteriorly to the head *e'* of blank R, I make use of two dies, B B', the male die B being made movable toward and from the face of die B' by mechanism usually employed for such purposes. The working-face of die B is flat, and by preference somewhat greater in area than the head-plate *e'*, which it is desired to form on blank E. A cavity, *b b'*, is formed in die B', adapted to receive the blank A endwise, the lump *a'* being outward. The form of this cavity is the same approximately as the exterior of blank R, and it is designed for shaping the exterior of the blank A, as represented by the blank E, Fig. 3. In doing this the piece A is properly heated and placed in cavity *b b'*, as described, and the die B is then brought down upon the end *a'*, either by one or more blows or by compression, with sufficient power to force the metal therein into the form of the cavity. The spread of metal in this operation is practically in the same direction as the course of fibers in and around the end *a'*; consequently the natural strength of metal will be preserved to a great degree; and it may be secured still more perfectly, when wrought-iron is employed, by means of piling, so as to secure a lay of fiber in different directions in the lump *a'*. This feature of piling iron is well understood, and need not be described in detail. The result of this spreading and upsetting operation in dies B B' is to form a blank, E, Fig. 3, having a rectangular body part, *e*, and an oval-shaped head or face plate, *e'*, and corresponding in exterior form to the blank R. These particular forms may be varied, however, as desired, that shown being adopted with reference to producing a draw-bar, S, Fig. 7, of the ordinary form. The section through the mold B' is taken in a plane parallel with the upper and lower faces of the draw-bar body. The forms required in the other walls of the cavity are not shown; but they can readily be determined by following the exterior shape of blank R, and from this it will be within the skill of the mechanic to shape the walls of the die-cavity with reference to securing the desired form of finished product. The desired exterior form being thus given to blank

E, the next step in the operation is to form a link-opening therein, both through the head-plate e' and also through part of the length of the body part e , immediately in rear of the head-plate. This is done as follows: The blank E, properly heated, is placed in a die, C, having a cavity, c c' , therein, adapted to receive it endwise and allow of a little spread of metal both in the head-plate and in the body immediately below the head. This is secured by making the parts c and c' of the cavity a little wider than blank E. The part c' is also made larger than the blank in the direction of the length of face-plate e' , its width in this direction being equal to the length of opening to be punched in the face-plate. The blank will be supported within the cavity both by the bottom end bearing of body part e and also by an annular shoulder or seat, c'' , under the periphery of the face-plate e' . A punch, C', is arranged to be moved by any suitable mechanism in the line of the die-cavity c c' . It is provided with a blunt or punch point corresponding approximately in form to the desired link-opening n in the head of blank R. The point of the punch may, however, be somewhat thinner than the width of opening n , and the body above the point be thickened upward, so as to operate both as a punch to carry a certain amount of metal forward with it, and also to spread somewhat the opening thus made. In operation the punch C' is forced into the end of blank E a sufficient distance to cut through the head-plate e' , forcing metal before it into the enlargement c' of the cavity below the face-plate, as represented at e'' . The blank E is then removed from this die C and placed in another die, D, having a cavity, d d' , therein, adapted in form to receive the blank inserted horizontally or sidewise, and support it therein both against vertical thrust and lateral distortion. An opening, d'' , is made through the die below the blank, corresponding in size and form to the piece which it is desired to remove from the center of the blank. Surrounding this opening a shoulder or seat forms a continuous rest or bearing for the edges of the blank while the center is punched out. The punch D' has a working-face of the same form as opening d'' , and it is moved by suitable mechanism through the die-cavity in line with such opening. In this downward movement the punch will force a quantity of metal before it through the body of the blank, thus continuing the opening made by the first punching operation backward toward the rear end of the blank, thus forming in the body part the slotted opening n' , connecting with or continuous with the opening n in the head. Such an opening extending backward from the head or face of the draw-bar is known as the "link opening" or "slot." The blank R thus formed may be sold to the trade as an article of manufacture, to be drawn out, shaped, and finished in the particular form and manner desired by the user, various patterns and styles of the class of draw-bars herein referred to being in

common use, one such form or style being shown in Fig. 7. This work of finishing and shaping may be done by a blacksmith upon a suitable anvil in the usual manner of doing such work.

In the manner described, a draw-bar, S, may be made, either of iron or steel, of one solid piece of metal, without welded or other artificial connection between its parts.

Owing to the fact that welding is not required, this method of making draw-bars is peculiarly well adapted to the use of steel as a material, and when such metal is used the preliminary blanks, from which the blanks E are formed, may be cast, since the mechanical working of the metal involved in the subsequent treatment will give it the character and desirable qualities, to a great degree, of wrought metal.

The advantages secured by this method of manufacture are material and important, both to the manufacturer, from the fact that workmen of less skill are required, the necessity of welding being obviated; also to the user, from the fact that draw-bars of more uniform strength are made in this way, since in manufacturing on a large scale there is always danger that some welded joints will not be made as they should be, and the defects not be apparent until the draw-bar is broken.

The special form and construction of dies shown and described for use in carrying out my invention, and also the blank and finished draw-bar made thereby, are not claimed herein, but will form, in part, the subject-matter of a separate application for patent.

I claim as my invention—

1. The method of manufacture of wrought-metal draw-bar blanks R herein described, consisting in first forging and shaping a solid bar or billet of metal to the desired exterior form of the blank; second, punching a link-opening through the center of the head-plate by forcing a quantity of metal out of such center toward the rear end of the blank; and, third, punching a link-opening in the body part by forcing a quantity of metal, including that displaced in the first punching operation, sidewise out of the center of such part, substantially as set forth.

2. The method of manufacture of wrought-metal draw-bars herein described, consisting in first forming a solid metal blank, E, having an enlarged head-plate, e' , on one end of its body e ; second, punching a central body of metal through the head-plate into the body; third, punching a central body of metal, including that carried into the body, sidewise out of the body; and, fourth, shaping and finishing the blank thus made on an anvil, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JOHN T. WILSON.

Witnesses:

C. L. PARKER,

R. H. WHITTLESEY.