METHOD OF MAKING AXLES.


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To all whom it may concern:

Be it known that I, CAMILLE MERCADER, of Pittsburgh, Allegheny county, Pennsylvania, have invented a new and useful Method of Making Axles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a diagrammatic sectional side elevation showing the blank clamped in place ready for compressing and punching. Fig. 2 is a similar view showing the punches in their final position, and Figs. 3, 4, and 5 are detail views showing different forms of punches or plungers.

My invention relates to the manufacture of axles by clamping a blank in matrix-dies and then piercing and expanding the end portions of the heated blank, and relates particularly to my United States Patents No. 524,092, dated August 7, 1894; No. 641,599, dated January 16, 1900, and No. 641,600, dated January 16, 1900.

The object of the invention is to lengthen the life of the plungers and avoid liability to their injury by the use of removable heads or caps thereon, which remain in the axle after punching.

In practicing the present invention I employ the clamping-dies 2 and 3 of substantially the same form as shown in my patents above referred to, and I clamp between said dies the cylindrical blank 4, the end portions of which are pierced and expanded by the plungers 5, these plungers being forced in by hydraulic cylinders or other suitable mechanism. The metal is expanded within the wheel-seat portions 6 and adjacent parts of the cavities, and during the last of the stroke the metal may flow back to fill up the end portions against the collars 7 around the rear ends of the punches.

The above-mentioned parts are shown and described in my patent; and the present invention consists in providing the plungers with removable end caps 8, which are fitted on before the piercing operation.

In Figs. 3, 4, and 5 I show different forms of the plungers each having a hollow steel cap 8 fitting neatly over its reduced end portion, the cap being preferably slightly larger in external diameter than the plunger. The cap thus projects slightly where its end abuts against the shoulder 9 of the plunger. In using these plungers the removable steel-cap portion is forced into the end cavity of the axle or other article and remains at the inner end of the cavity when the punch is withdrawn. The heating of the punch is thus largely avoided, thus reducing liability to bending and injuring it.

Many variations may be made in the form and arrangement of the dies, the punches, and other parts without departing from my invention.

I claim—

1. The method of making axles and similar articles, consisting in clamping a heated blank between dies having a matrix-cavity, applying hollow metal caps to the ends of punches, simultaneously forcing the punches into the ends of the blanks, and then withdrawing the punches, leaving the caps in the cavities; substantially as described.

2. The method of punching a hot metal blank, consisting in clamping the blank side-wise, applying a hollow cap over the end portion of a punch, forcing the punch into the end of the blank to pierce and expand it and then withdrawing the punch, leaving the cap in the cavity; substantially as described.

In testimony whereof I have hereunto set my hand.

CAMILLE MERCADER.

Witnesses:
C. P. BYRNES,
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