G. A. MORSE.

Dies for Making Axle Boxes.

No. 201,935. Patented April 2, 1878.

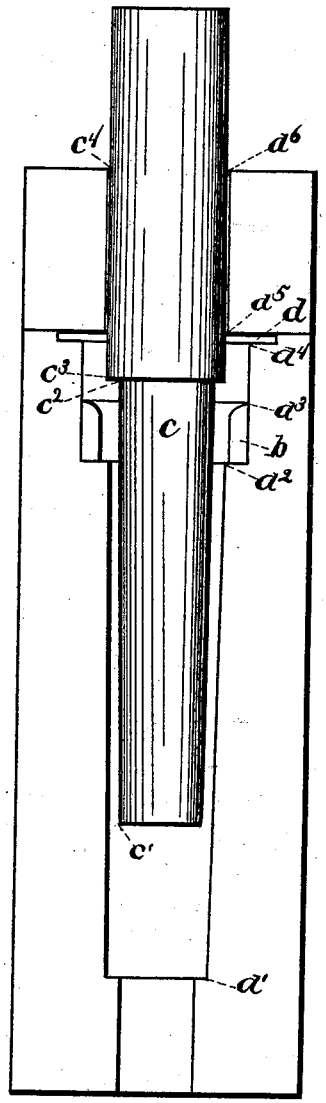

Fig. 1.

Witnesses:
Robt. F. Gaylord
W. E. Hill

Inventor:
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By W. E. Simmds
Att.

UNITED STATES PATENT OFFICE.

GILBERT A. MORSE, OF SOUTH EGREMONT, MASSACHUSETTS.

IMPROVEMENT IN DIES FOR MAKING AXLE-BOXES.

Specification forming part of Letters Patent No. **201,935**, dated April 2, 1878; application filed January 26, 1878.

To all whom it may concern:

Be it known that I, GILBERT A. MORSE, of South Egremont, in the county of Berkshire and State of Massachusetts, have invented certain new and useful Improvements pertaining to Dies and Punches for Making Axle-Boxes, of which the following is a specification, reference being had to the accompanying drawings, where—

Figure 1 is a face view of one of the two corresponding die-halves, showing the punch or plunger inserted to about the depth it enters in making an axle-box forging. The other die-half is substantially the same as the die-half shown.

These dies are partible, (lengthwise,) and are intended for forming axle-boxes for vehicle-axles. The boxes are, of course, round or cylindrical on the outside, and also on the inside. The matrix of the dies and the plunger are, of course, similarly rounded.

The letter *a* denotes one of the two duplicate or corresponding die-halves, with a slight taper in the matrix from a^1 to a^2 in both dies and plunger, so as to similarly taper the pipe or axle-box. The die-half *a* and its fellow are worked by appropriate machinery, coming together face to face when a box is to be made, and then separating.

The wrought-iron pipe which constitutes the stock is cut off to the proper length (for different thicknesses and lengths of boxes this is necessarily a matter for preliminary experiment) and heated to a forging-heat before submission to the dies.

From the point a^2 to the point a^3 the matrix is flared or expanded, or enlarged, as shown in the drawings. In this flare are the the recesses *b*, to form the nibs or small wings which generally appear on the outsides of axle-boxes.

The plunger *c*, when fully entered, may be long enough to pass fully through the length of the dies and out at the opposite end, the shoulder a^1 preventing the stock from doing the same; or it may be shorter, as shown in the drawing.

The matrix from a^3 to a^4 is regular, (neither enlarged nor contracted in that interval,) and at the upper end of this recess is located the surplus-recess *d*.

From a^4 to a^5 a shoulder is formed, which substantially forms the top or larger end of the box. The portion from a^5 to a^6 is not a part of the matrix proper, but is a support or holder for the stock before it is upset by the plunger.

The plunger *c* is tapered from c^1 (meaning the end) to c^2. From c^2 to c^3 a lateral shoulder is formed, and from c^3 to c^4 it is regular. From c^3 to c^4 it does not quite fill the stock-support a^5 a^6.

The stock, having been cut to the proper length and heated, as hereinbefore set forth, is placed between the dies, one end coming to the shoulder a^1, and the other end coming up into, or projecting out of or above, the stock-support. At this point the plunger may be partially entered within the stock. The die-halves now come together face to face, clamping the stock firmly, and, if the matrix be tapered from a^1 to a^2, forming the taper on the outside. The plunger now advances to its work, (to about the depth shown in the drawing,) forcing down and upsetting the stock till it fills the matrix, the shoulder c^2 c^3 acting on the end of the stock.

To insure the filling of the matrix, the stock should be something more in amount than just sufficient to make the box. The surplus will remain in the shape of fins (afterward to be trimmed off) formed between the larger part of the punch and the stock-support, and also formed in the surplus-recess *d*. This surplus-recess is located at the point described, to insure the stock filling this corner in the dies.

The particular features of invention are the surplus-recess, to insure the filling of this corner, and the stock-support above the matrix proper.

The conformation of the punch and matrix may be varied otherwise than as to said features without departing from the invention.

These dies and this punch are intended for forming the axle-box forging without the aid of other or preparatory dies and punches; but I do not mean to restrict myself in any such regard.

I claim as my invention—

In dies for forming axle-boxes, the surplus-recess *d*, located at the large end of the matrix, in combination with the stock-support a^5 a^6.

GILBERT A. MORSE.

Witnesses:
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