W. W. KNOWLES.

Manufacture of Carriage-Axle Boxes.

No. 164,187. Patented June 8, 1875.

fig. 1.

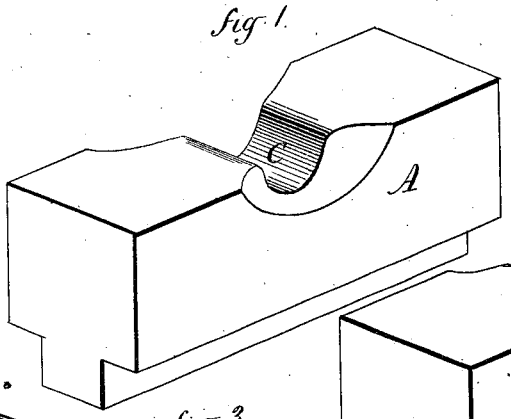


fig. 2.

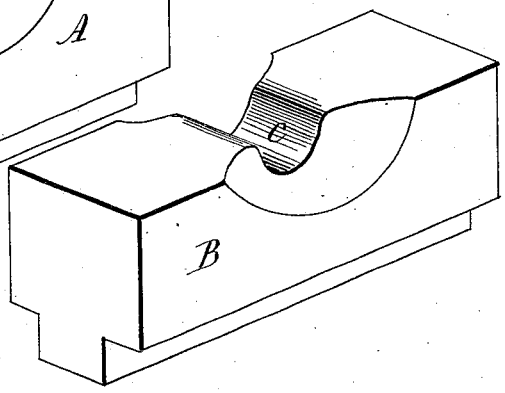


fig. 3.

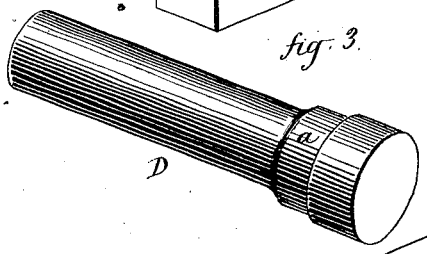


fig. 4

fig. 5.

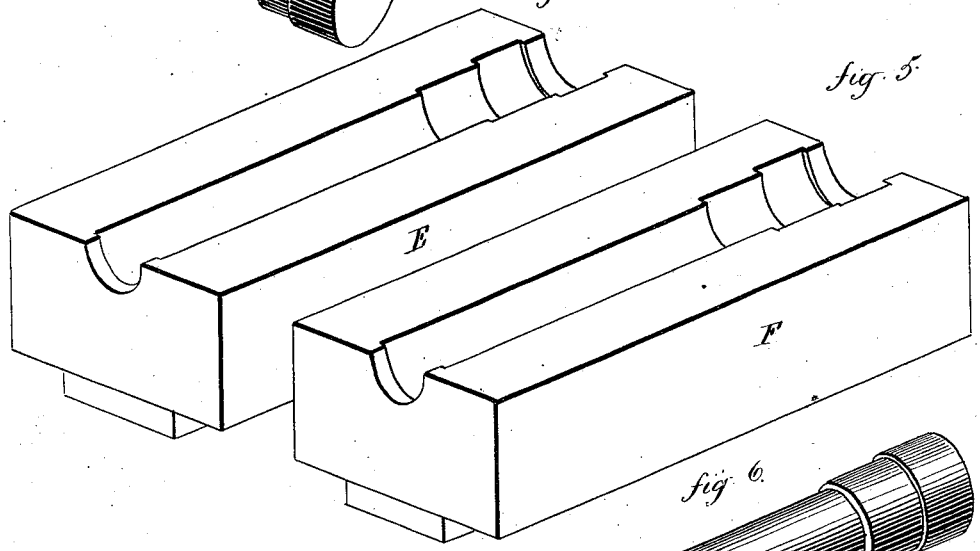
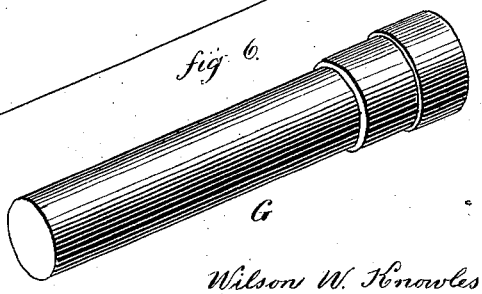


fig. 6.



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UNITED STATES PATENT OFFICE.

WILSON W. KNOWLES, OF MOUNT CARMEL, CONNECTICUT, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOSEPH A. GRANNIS, OF SAME PLACE.

IMPROVEMENT IN THE MANUFACTURE OF CARRIAGE-AXLE BOXES.

Specification forming part of Letters Patent No. **164,187**, dated June 8, 1875; application filed March 19, 1875.

To all whom it may concern:

Be it known that I, WILSON W. KNOWLES, of Mount Carmel, in the county of New Haven and State of Connecticut, have invented a new and Improved Method of Making Axle-Boxes; and do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figures 1 and 2, perspective views of the two parts of the breaking-down or principal dies; Fig. 3, the mandrel to be used in combination with the dies, Figs. 1 and 2; Figs. 4 and 5, perspective views of the finishing-dies; Fig. 6, the mandrel to be used in combination with the dies, Figs. 4 and 5.

This invention relates to an improvement in the manufacture of wrought-metal carriage-axle boxes.

Heretofore these boxes have been formed by bending and welding the sheet-metal blank and then striking to form from the inside, as in the patent of F. B. Morse, January 10, 1872.

Another method has been to use short sections of tubing, upsetting and expanding one end to form the neck, the tubing itself being substantially the diameter of the completed box; but in both of these methods difficulties are experienced in consequence of the stretching or spreading of the metal to form the neck.

The object of this invention is to construct the box from sections of tubing and yet avoid the difficulties heretofore experienced; and the invention consists in the employment of a pair of breaking down or drawing dies and a mandrel, whereby a section of tubing of the largest diameter of the neck of the box may be placed upon the said mandrel, and the part of the box from the neck to the end drawn down upon the mandrel to the required diameter for the box, and combining therewith a pair of finishing-dies of the required shape for the exterior of the box, and a mandrel for the interior, as more fully hereinafter described.

A is the one part, and B the other part, of a pair of dies. These dies have a substantially semicircular recess, C, in each, the angles of the recess rounded, as seen in Figs. 1 and 2. These dies are arranged—the one stationary and the other so as to have a powerful reciprocating movement—to strike down upon the stationary part. D is a mandrel, the body of which is substantially the diameter of the interior of the box to be produced, the head *a* substantially that of the interior of the neck.

A section of tubing, the internal diameter of which is substantially that of the neck to be produced, is set over the mandrel onto the head, it having been previously heated to the required degree for forging. This mandrel with the tube thereon is then placed between the dies A B and drawn back and forth between those dies, and at the same time rotated, receiving the successive blows of the moving die until that part of the tube from the head to the other end is drawn down upon the mandrel, and to the required thickness, as indicated by the relative diameter of the dies and mandrel. This prepares the blank for the finishing operation, and this may be done in the dies heretofore employed, or as is preferred in the dies E F, Figs. 4 and 5. These have each a cavity corresponding to one-half the exterior of the completed box, and with these a mandrel, G, Fig. 6, is employed, the shape of the mandrel corresponding to the interior of the box.

The blank as prepared by the first operation is placed upon the mandrel G, and that laid into the stationary die E, and struck by the other part F, completing the box.

As before mentioned, other finishing-dies may be substituted for the finishing-dies which have been last described; but the first, or breaking-down dies, with their mandrel D, are essential to the forming of a box from a tube of larger diameter than the box to be produced.

I claim—

The method described for making axle-boxes from tubing by means of the dies, and as hereinbefore described.

WILSON W. KNOWLES.

Witnesses:

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