G. A. MORSE.

MANUFACTURE OF AXLE-BOXES.

No. 187,722. Patented Feb. 27, 1877.

Fig. 1.

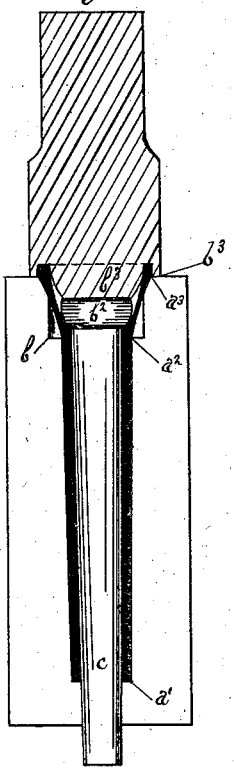
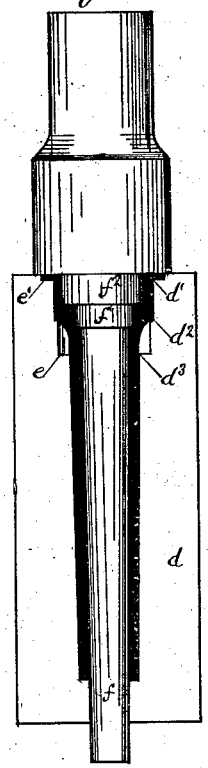


Fig. 2.



WITNESSES:

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Att'y.

UNITED STATES PATENT OFFICE.

GILBERT A. MORSE, OF PLANTSVILLE, ASSIGNOR OF ONE-HALF HIS RIGHT TO THE DALZELL & IVES WROUGHT BOX COMPANY, OF NEW HAVEN, CONNECTICUT.

IMPROVEMENT IN THE MANUFACTURE OF AXLE-BOXES.

Specification forming part of Letters Patent No. **187,722**, dated February 27, 1877; application filed November 29, 1876.

To all whom it may concern:

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

Figure 1 is a view of the face of one of the two dies which form the first set, showing the punch or plunger entered to the full length, with a small part of the plunger in section. Fig. 2 is a view of the face of one of the two dies which form the second set, showing the plunger entered to the full length.

These are dies and punches or plungers for forming axle-boxes for vehicles. They are partible dies, and are intended to form up axle-boxes from wrought-iron pipe—such as gas-tubing.

The letter *a* denotes one of two duplicate dies which form the first set, with a slight taper from a^1 to a^2 in both dies and plunger, so as to similarly taper the pipe or axle-box. The die and its fellow come together in proper machinery, and the properly-heated pipe, of a length somewhat greater than the length of the die, so as to give the requisite amount of stock for the upsetting required, may be introduced into the matrix before or after the dies come together—preferably before. From the point a^2 the die has a regular flare to the mouth a^3. In this flare are the cutaways *b*, to commence the formation of the nibs, which generally appear on the outsides of axle-boxes. The plunger *c*, when fully entered, passes fully through the length of the die, and out of the opposite end, the shoulder a^1 preventing the stock from doing the same. That part of the punch which is within the flared mouth of the die rises by two swells, b^1 b^2, till it passes out of the die, and where these swells end the punch bears a flange, b^3, forming a cup, which catches the end of the stock-pipe, and prevents its escape from the proper action of the punch. The letter *d* denotes one of the two duplicate dies which form the second and finishing set. This die differs from the die *a* by being regular, instead of flared, in shape from d^1 to d^2, by the shape of the flare from d^2 to d^3, and by having the cutaways *e* farther down at the point where the nibs belong on the finished box. The punch *f* for this second set differs from the punch *c* by having, in place of the two swells, the regularly-cylindrical enlargements f^1 f^2, and by not having the flange b^3. At the upper or mouth end of die *d* is an annular recess, *e'*, to take up any small excess of stock. The product of the first set of dies is finished in the second set.

I am aware that previous to my making this invention a patent or patents have been granted for solid dies and punches for forging axle-boxes from tubing, and I make no claim, broadly, to such dies and punches or process, and to no dies and punches which do not have certain distinctively new features shown in the dies and punches herein described, to wit: first, lengthened partibility of the dies, so that their side clamping motion may avail to form the main body of the box to a taper; second, a punch going entirely through the dies, so as to support the body of the tubing from collapsing or bending inward when the tubing is under process of upsetting at the end, and also forming a resisting medium for the inside of the tubing, to give taper shape to the inside of the tubing, and to prevent the tubing from being bent inward irregularly under the side clamping action of the dies; third, a punch so constructed that its "follower" part does not enter the mouth of the die.

I claim as my invention—

Jointly, the two sets of partible dies and punches for forming axle-boxes, substantially as shown and described.

GILBERT A. MORSE.

Witnesses:

ROBT. F. GAYLORD,

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