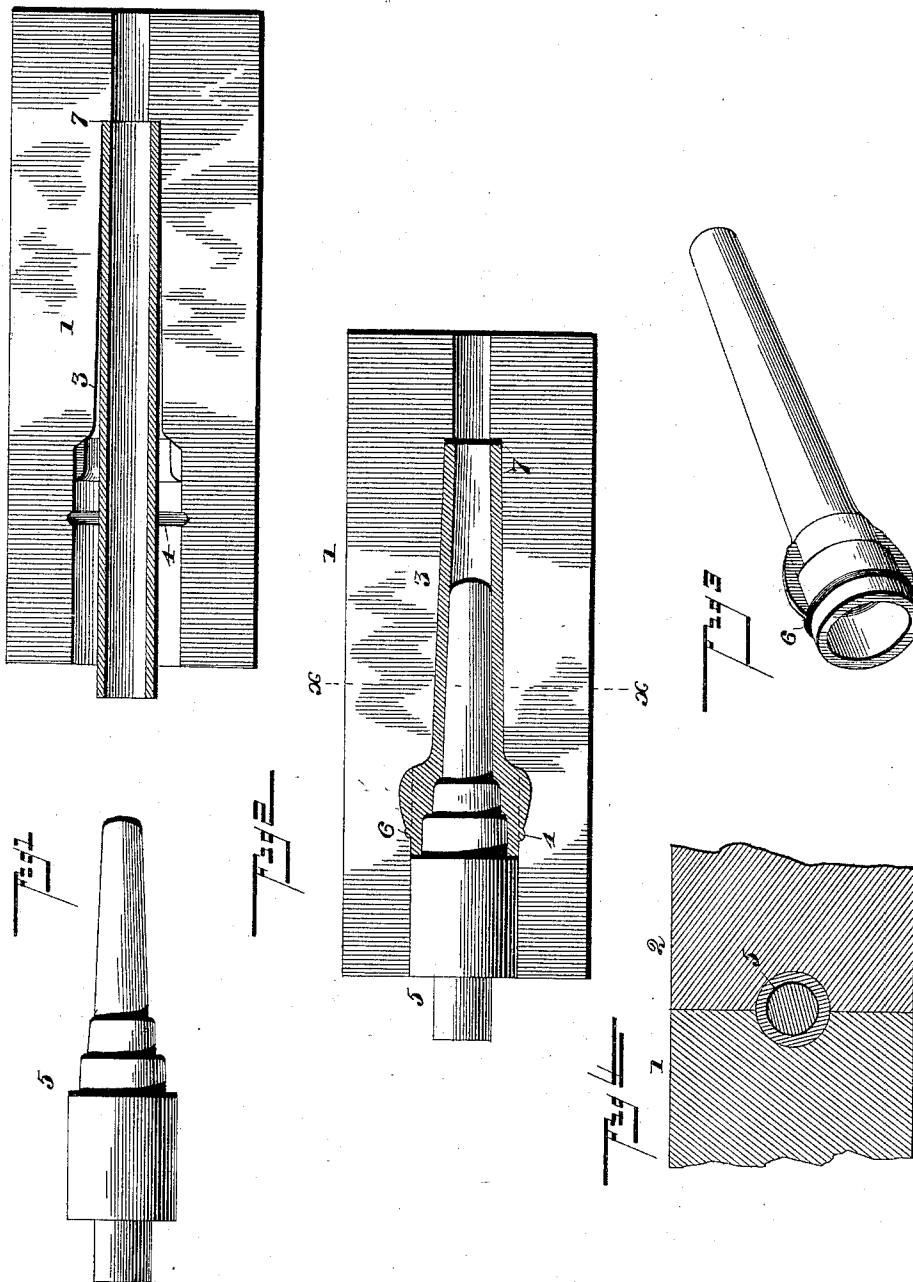


(No Model.)

W. J. PARMELEE.
DIE FOR FORGING AXLE BOXES.

No. 430,539.

Patented June 17, 1890.



Witnesses

John Smith
Wm. Bagger

By his Attorneys,

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UNITED STATES PATENT OFFICE.

WOLCOTT J. PARMELEE, OF WILKES-BARRÉ, PENNSYLVANIA.

DIE FOR FORGING AXLE-BOXES.

SPECIFICATION forming part of Letters Patent No. 430,539, dated June 17, 1890.

Application filed January 22, 1890. Serial No. 337,748. (No model.)

To all whom it may concern:

Be it known that I, WOLCOTT J. PARMELEE, a citizen of the United States, residing at Wilkes-Barré, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Die for Forging Axle-Boxes, of which the following is a specification.

This invention relates to improvements in dies for forming axle-boxes.

Prior to my present invention it has been common to construct axle-boxes by forging in dies. Usually two separate dies have been employed, one a male and the other a female die, the latter being usually made in two parts or sections, one of said sections being movable and the other stationary. There have been several serious objections to the type of dies heretofore employed, one of the principal objections being that the male die, used for upsetting and shaping the stock, would become so firmly connected with the latter as to withdraw it from the female die, in which event considerable difficulty was frequently experienced in removing the axle-box from the male die or mandrel, upon which it would become very firmly fixed by shrinking thereupon. It is mainly with the object of overcoming this disadvantage that my present invention has been devised.

In the drawings hereto annexed, in Figure 1 is an elevation of one half or section of the female die, showing in longitudinal section the tubular stock inserted therein previous to being subjected to the action on the mandrel, the latter being shown in side elevation. Fig. 2 is a similar view showing the mandrel in position in the female die. Fig. 3 is a perspective view of an axle-box constructed by my improvement. Fig. 4 is a transverse sectional view, taken on the line *xx* of Fig. 2.

Like numerals of reference indicate like parts in all the figures.

1 and 2 designate, respectively, the stationary and the movable parts or sections of the female die, both of which are provided in their meeting faces with grooves or recesses 3, of a shape or outline to correspond with the outline of the exterior of an axle-box. An annular groove 4 is formed at the inner end of the female die in the portion of said die which forms the head of the axle-box.

5 designates the male die or mandrel, the

exterior shape of which is such as to correspond with the internal configuration of the axle-box. The said die and mandrel are both mounted in suitable operating machinery in such a manner that in operation the section 1 of the female die shall remain stationary, while to the section 2 of the said die a lateral movement shall be imparted, and to the mandrel a longitudinal movement, the said die-section 2 and mandrel 5 being intermittently reciprocated by suitable operating mechanism properly timed. The operating machinery and mechanism, however, form no part of my present invention, and have not been illustrated in the drawings hereto annexed.

The stock from which axle-boxes are manufactured by my improvement consists simply of a cylindrical tubular blank of proper dimensions. This blank having been heated to a forging-heat is grasped by means of a pair of tongs that fit on the inside of the said tubular blank and held in the groove or recess in the face of the stationary female-die section while it is being operated upon. The movable section of the female die is then actuated or caused to approach the stationary section of the said die. The two sections coming in contact with each other will partially shape the blank by tapering the outer end of the latter to correspond with the configuration of the recesses in the faces of the two sections of the die. As soon as the two sections of the female die come together, and while they are in contact with each other, the male die or mandrel is operated and forced endwise into the blank or stock, upsetting the latter and compressing it in and causing it to fill the interior of the recesses in the faces of the female-die sections, thus shaping both the interior and the exterior of the axle-box and making it conform to the configuration of the dies. By the operation of compressing or upsetting the stock within the female die the annular groove 4 in the latter will be filled by a small surplus of the stock, thereby forming on the exterior of the axle-box an annular rib 6, which, being very small, may be easily trimmed off by the subsequent finishing process to which the axle-box is subjected, it being understood that said rib is not intended to form a part of the finished

axle-box. Said rib, however, performs an exceedingly important function in the process of manufacturing the axle-box, inasmuch as when the mandrel is withdrawn from the die it serves to firmly secure the axle-box in the latter and to prevent it from adhering to and being withdrawn with the male die or mandrel. I thus accomplish the primary object of my invention. When the movable section of the female die moves back from the stationary section of said die, the axle-box will readily leave the latter and may be conveniently removed by means of the tongs with which it was held in position during operation.

A short distance from the outer end of the two-part female die the grooved faces of the latter are shouldered, as shown at 7, this shoulder forming an abutment, the object of which is to prevent the tubular stock or blank from being displaced longitudinally by the action of the mandrel. When the latter enters the female die its tendency of course would be to force the blank longitudinally and endwise through the blank. This is obviated and the stock or blank is held securely while being operated upon by this formation of the female-die sections. A further object attained by this peculiar construction is the absolute accuracy and similarity of size with which the product is constructed.

The female-die sections, as already stated, have no longitudinal movement, and the longitudinal movement of the mandrel or male die is so regulated by the operating machinery as to be invariably alike. It follows that the axle-boxes constructed by my improvement will be absolutely identical in size and shape, subject, of course, to modifications in the construction of the dies employed. When the mandrel enters the female die, it will be found that a small portion of the surplus material of the stock will escape between the meeting-faces of the female-die sections, principally at the head of the axle-box. This is the small surplussage of material which it is necessary to give the stock, for the reason that absolute accuracy in the size of the latter is

not easily attained. This small surplus portion, which is termed the "flash," will be formed on diametrically opposite sides of the head of the axle-box, and it is formed at these points alone, because this is just the point where the mandrel strikes the female die. It might be thought that this flash would serve to assist the annular rib in preventing the withdrawal of the axle-box endwise from the female die, or even that it alone might perform this service; but such is not the case. The flash is subsequently removed from the axle-box by means of an apparatus an application for Letters Patent for which is filed on even date with this application. The flash having been removed, the product is finished and ready for the turner.

Having thus described my invention, what I claim is—

1. The female die made in separable sections and having an interior annular groove or recess, substantially as and for the purpose set forth.

2. A female die for the manufacture of axle-boxes made in separable sections provided with grooves or recesses to form ribs or enlargements exteriorly upon the axle-box, in combination with the mandrel or male die, substantially as and for the purpose set forth.

3. In the manufacture of axle-boxes by die-forging, the herein-described process of upsetting into a suitable groove or recess formed in the faces of the separable sections of the female die a surplus portion of the stock, to be afterward removed by trimming, for the purpose of preventing the withdrawal from the female die of the stock or product by the receding movement of the mandrel or male die, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

WOLCOTT J. PARMELEE.

Witnesses:

BEN C. PRICE,
S. C. STRUTHERS.