

(No Model.)

2 Sheets—Sheet 1.

O. C. HALL.
MANUFACTURE OF CHANNELED AXLES.

No. 471,544.

Patented Mar. 29, 1892.

Fig. 1.

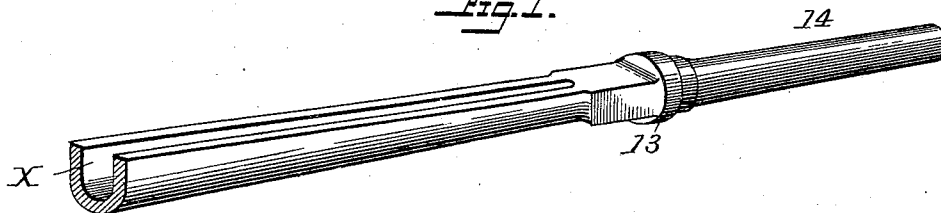


Fig. 2.



Fig. 4.



Fig. 3.

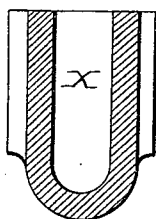


Fig. 5.

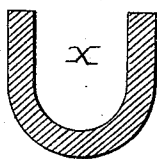


Fig. 6.

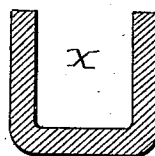
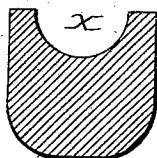


Fig. 7.



Witnesses
Geo. G. Hinkel
Alvan Macaulay

Inventor
O. C. Hall.
By *John Freeman*
Attorneys

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2 Sheets—Sheet 2.

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Fig. 8.

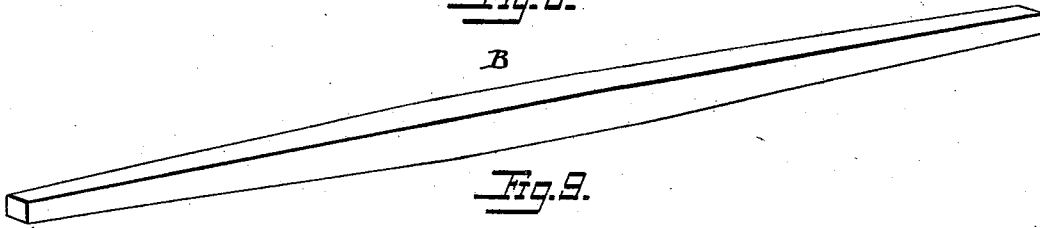


Fig. 9.

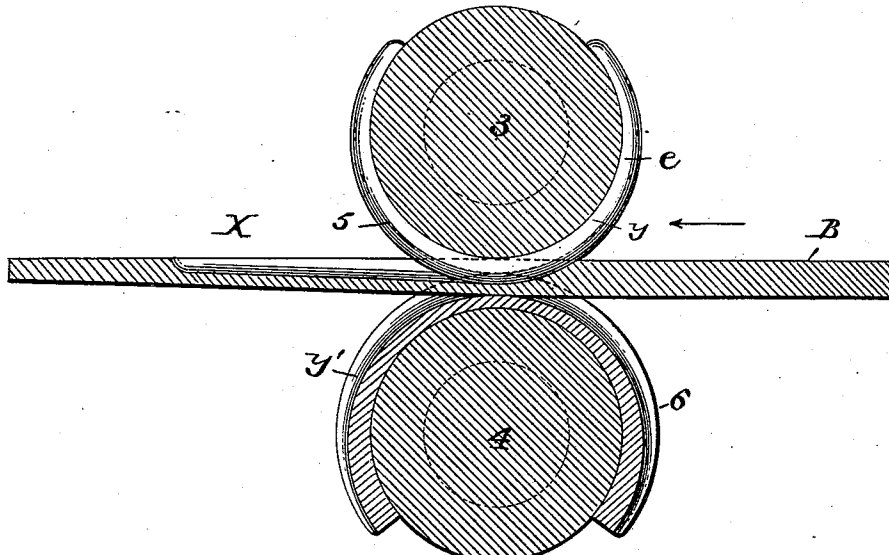
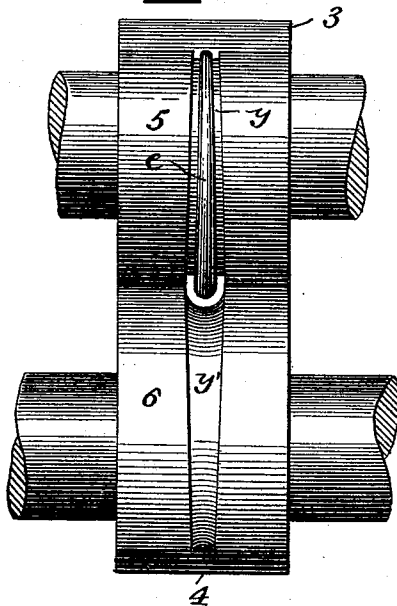


Fig. 10.



Witnesses
Jno. G. Hinkel
Alvan Macaulay

Inventor
O. C. Hall
By
Foster Freeman
Attorneys

UNITED STATES PATENT OFFICE.

ORLANDO CLIFFORD HALL, OF AUBURN, NEW YORK, ASSIGNOR TO THE
SHELDON AXLE COMPANY, OF WILKES-BARRÉ, PENNSYLVANIA.

MANUFACTURE OF CHANNELED AXLES.

SPECIFICATION forming part of Letters Patent No. 471,544, dated March 29, 1892.

Application filed January 11, 1892. Serial No. 417,732. (No model.)

To all whom it may concern:

Be it known that I, ORLANDO CLIFFORD HALL, a citizen of the United States, residing at Auburn, in the county of Cayuga and State of New York, have invented certain new and useful Improvements in the Manufacture of Channeled Axles, of which the following is a specification.

My invention relates to the manufacture of that class of axles and axle-blanks having longitudinal channels or grooves; and my invention consists in forming said grooves and preferably simultaneously shaping the exteriors of the axles by subjecting a rectangular bar to the action of dies, as fully set forth hereinafter, and also in the construction of the dies to effect the improved method of manufacture.

In the accompanying drawings, Figures 1, 2, and 4 are views in part section illustrating channeled axles of the forms desired to be produced. Figs. 3, 5, 6, and 7 illustrate in cross-section different forms of channeled axles. Fig. 8 is a perspective view of a bar from which an axle may be rolled. Fig. 9 is a sectional elevation of one form of mill which may be employed. Fig. 10 is a view of the mill looking in the direction of the arrow, Fig. 9.

The axle bar or blank to be formed may have any suitable external outline or cross-sectional form with a longitudinal groove or channel *x*. Thus it may be wider and deeper at the center and tapering toward the ends, with a channel at the top, as illustrated in Figs. 1 and 2, or it may be narrower at the center, as illustrated in Fig. 3, decreasing in depth toward the ends and increasing in depth toward the center, or it may be wider and shallower at the center, increasing in depth toward the ends, as indicated in Fig. 4, and it may be rounded or substantially square in cross-section, as in Figs. 5 and 6, and may be thicker at the bottom than at the sides, as in Fig. 7.

I do not here claim an axle having a groove or channel, as this constitutes the subject of a separate application for Letters Patent, Serial No. 417,731, the invention herein set forth relating to the manufacture of such axles or axle-blanks. In such manufacture I first roll

or force or otherwise shape a bar B, Fig. 8, to a substantially rectangular shape in cross-section and preferably tapering in both directions from the center toward the ends, although the shape of the bar will depend of course upon the external configuration of the axle to be produced. In order to channel and properly shape said bar to make the improved axle bar or blank, I subject it to the action of a rolling-mill in which there are two rocking or rotating rolls 3 4, the roll 3 carrying a die 5 and the roll 4 carrying a die 6, in which dies are grooves or channels *y y'*, adapted to secure the proper conformation of the bar as it is passed between them. In the construction shown the groove *y'* is adapted to shape the exterior of the bar, while the groove *y* of the die 5 has a longitudinal tongue *e* of such shape and so arranged that as the bar passes between the dies it will indent the same, forming the groove *x*. It will be seen that the tongue *e* in acting upon the bar tends to spread the latter, and will thereby force it outward to fill the outline of the pass, and thus facilitates the shaping of the bar in the process of molding. In the construction shown the end of the bar is introduced between the ends of the rolls 3 4 before they have turned sufficiently to bring the dies into proximity, after which the dies are brought to act upon the bar adjacent to the end, and the latter in passing between the dies is shaped from one end to the other. Instead of dies revolving continuously, as thus described, however, oscillating dies may be employed, as in rolling, tapering, and other axle-bar blanks. The ends of the bar may be formed into journals 14 before or after or during the time that the bar is being acted upon to shape the same and form the channel, and the collars 13 may be formed by means of upsetting-dies either before or after the bar is acted upon to channel the same.

Without limiting myself to the particular construction of dies shown, I claim—

1. The within-described improvement in the art of making axle bars or blanks, consisting in subjecting a rectangular bar to traveling pressure between dies provided with a tongue *e*, substantially as set forth.

2. In the manufacture of axle bars or blanks,

subjecting a rectangular bar to the action of
shaping-dies, with grooves adapted to impart
the desired external shape to the blank, and
with a tongue arranged to spread and chan-
5 nel the blank, substantially as described.

3. In a mill for rolling axle bars or blanks,
the combination of two rolls provided with
dies, one with a groove adapted to impart the
desired external form to the bar and the other
10 with a tongue *e*, substantially as described.

4. The combination, in a mill for rolling

axle bars or blanks, of rolls 3 4, provided with
dies 5 6, shorter than the peripheries of the
rolls, one of the dies provided with a tongue
e, substantially as described. 15

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

ORLANDO CLIFFORD HALL.

Witnesses:

DORA M. FORREST,
WM. H. DALTON.