No. 808,736. PATENTED JAN. 2, 1906.

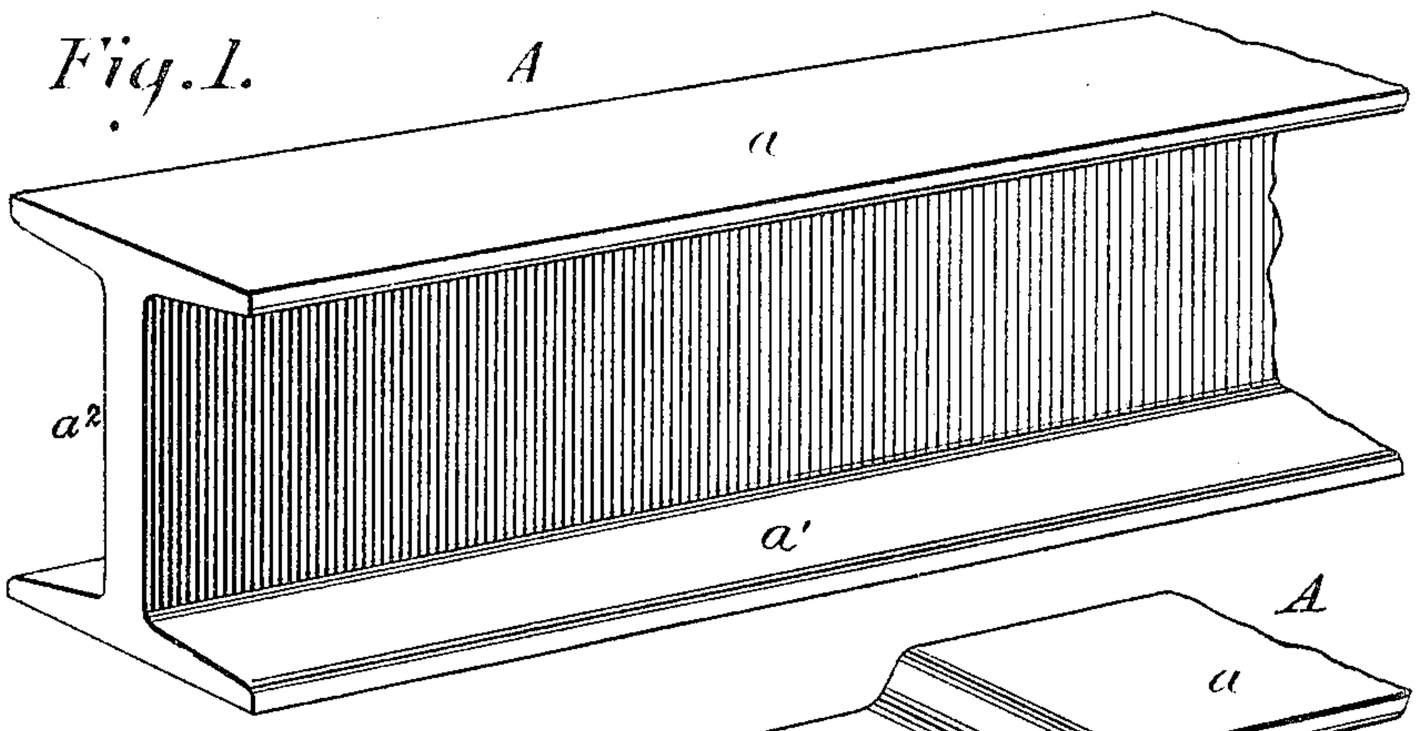
E. EINFELDT.

METHOD OF SHAPING METAL BARS.

APPLICATION FILED MAR. 17, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



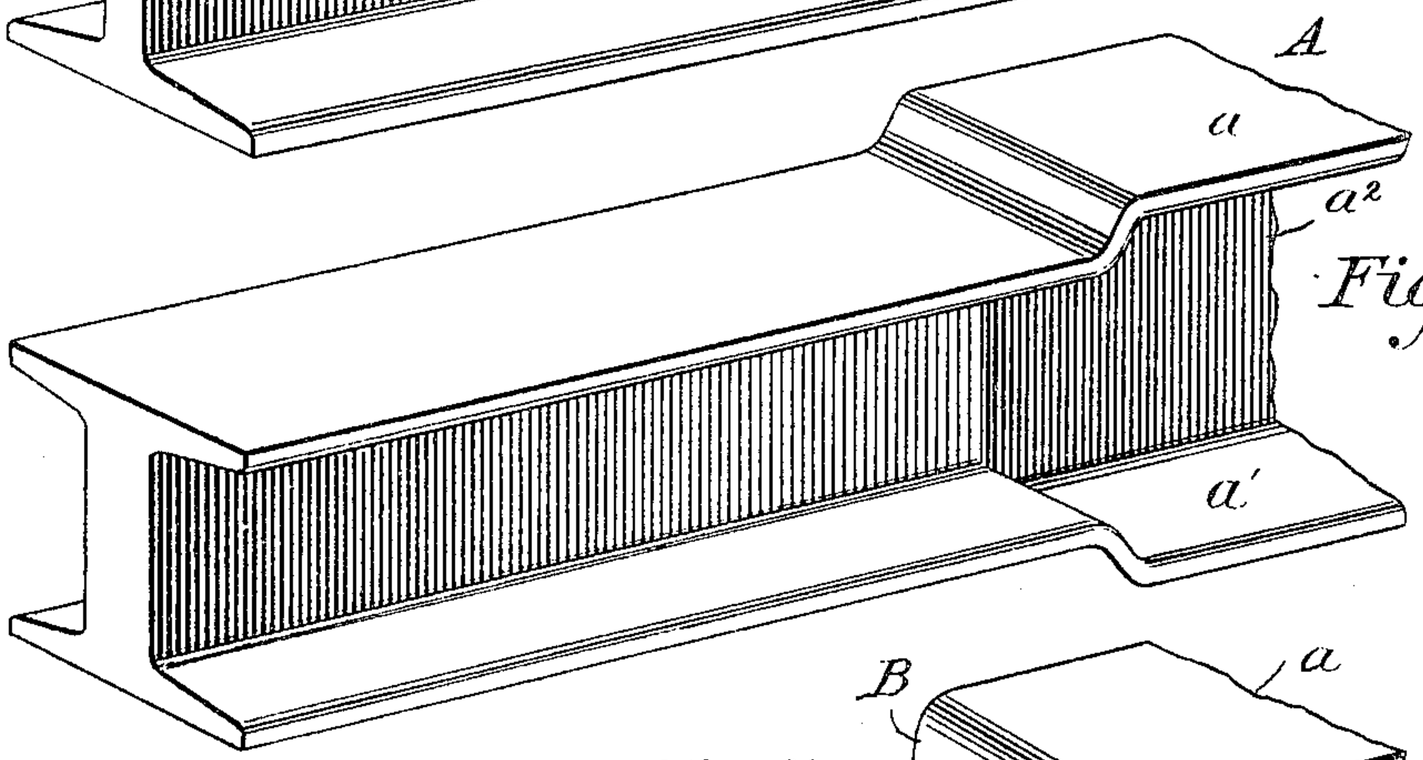


Fig. 2.

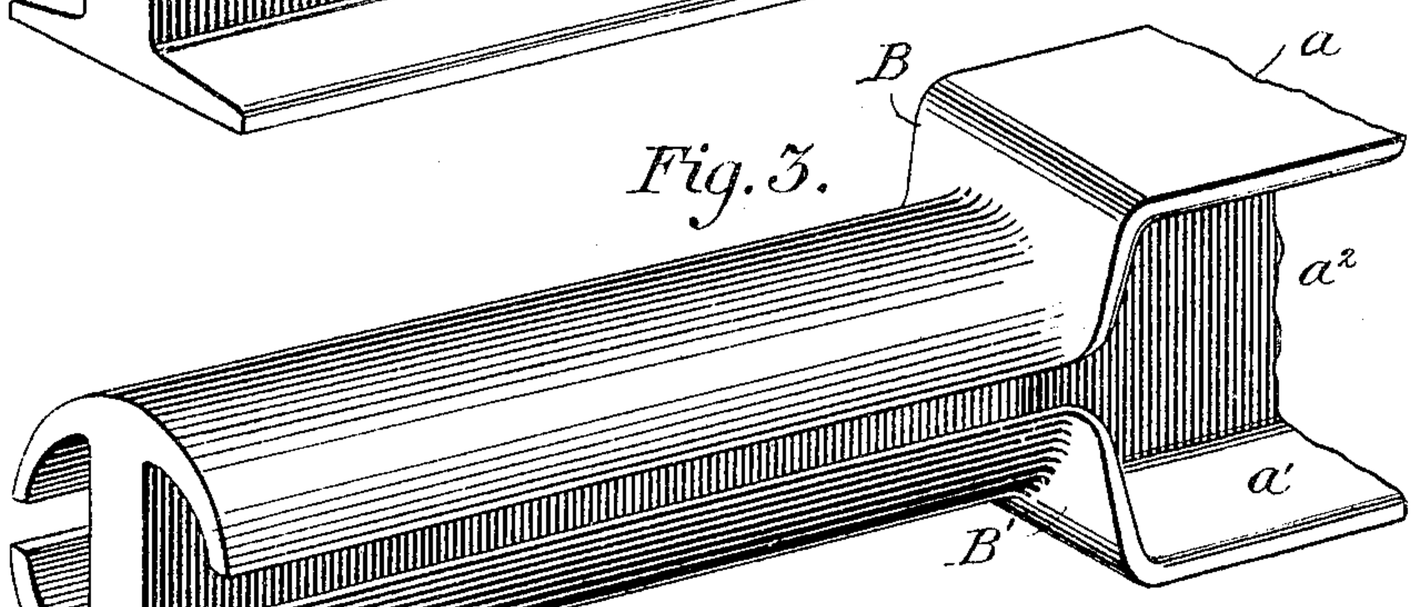


Fig. 3.

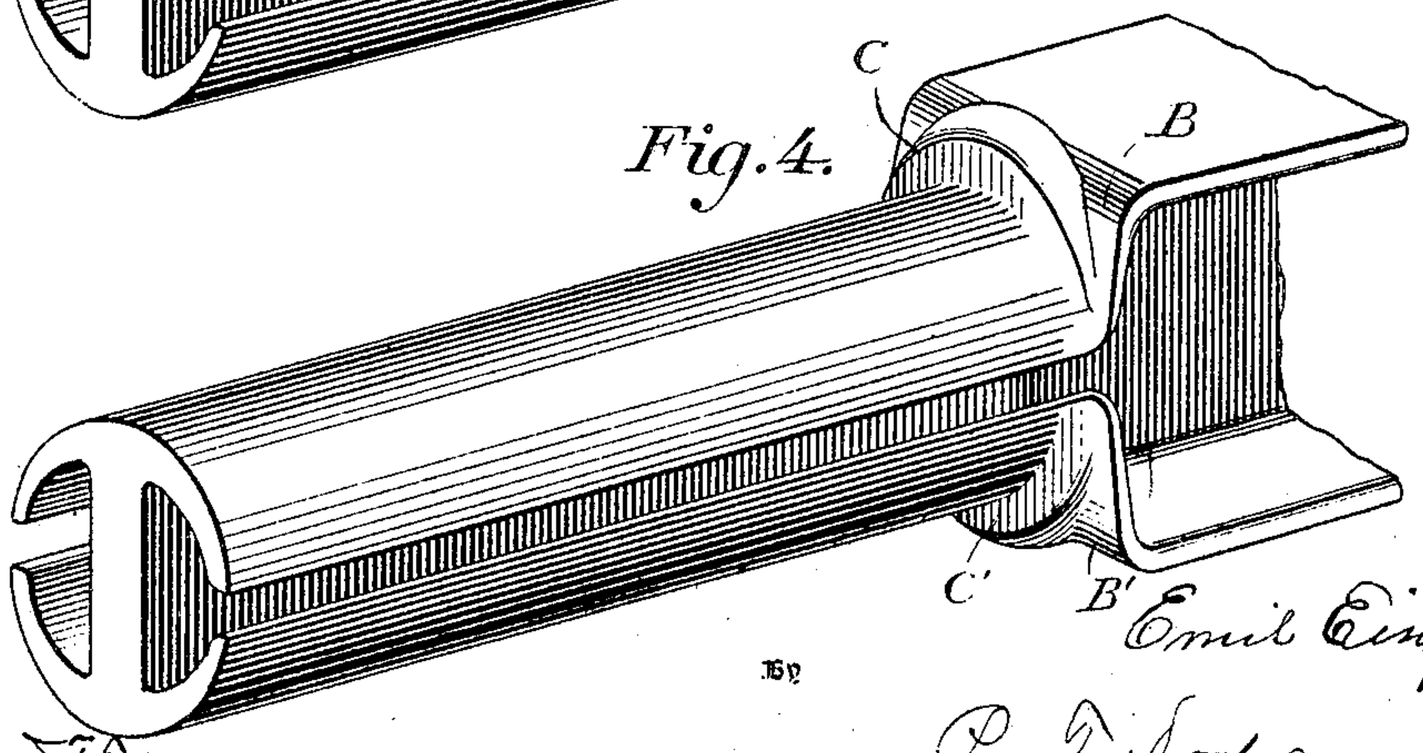


Fig. 4.

Witnesses

Raymond F. Barnes.

D. E. Burdine.

Inventor

Emil Einfeldt

By

P. T. Dodge

Attorney

No. 808,736. PATENTED JAN. 2, 1905.

E. EINFELDT.

METHOD OF SHAPING METAL BARS.

APPLICATION FILED MAR. 17, 1905.

2 SHEETS—SHEET 2.

Fig. 5.

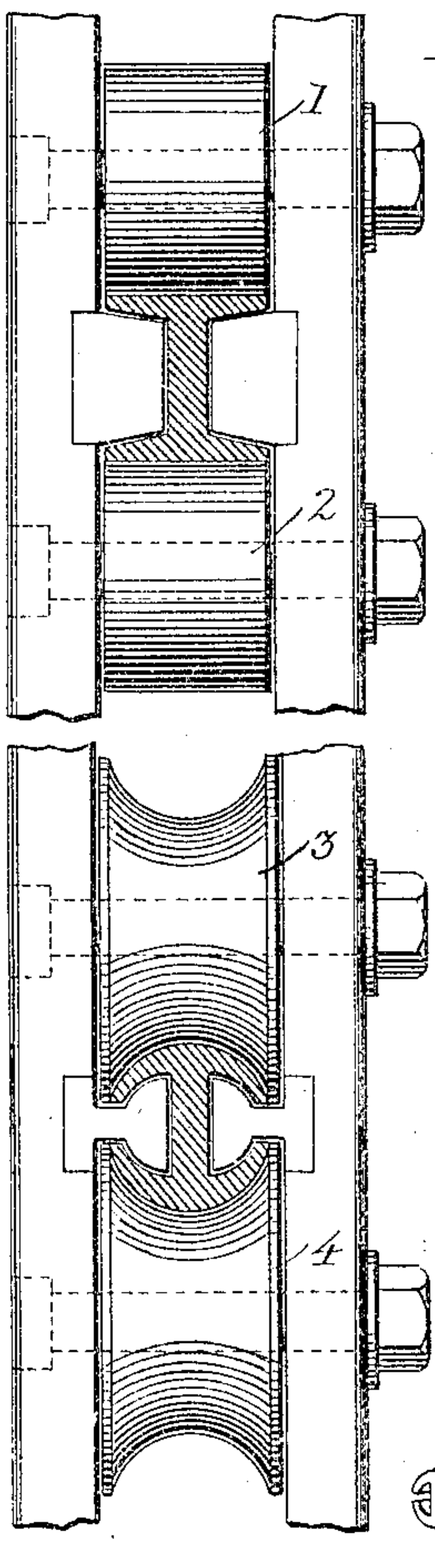


Fig. 6.

Fig. 7.

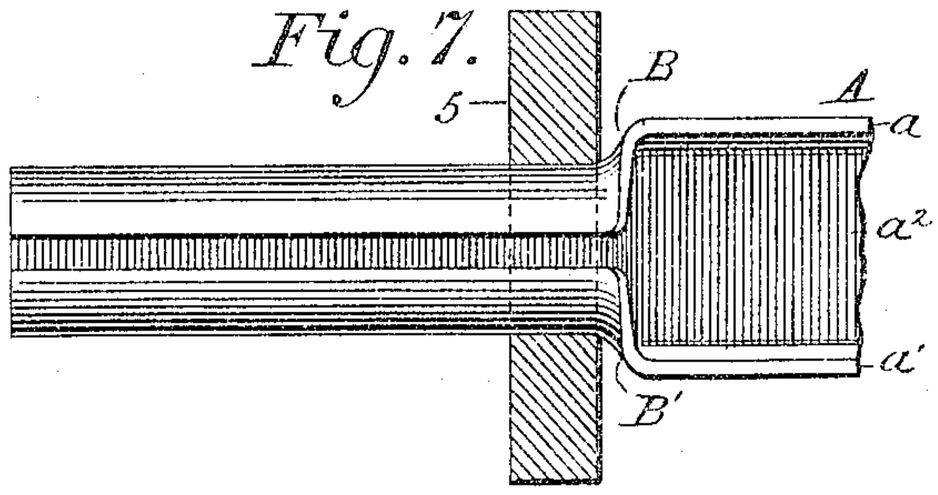


Fig. 8.

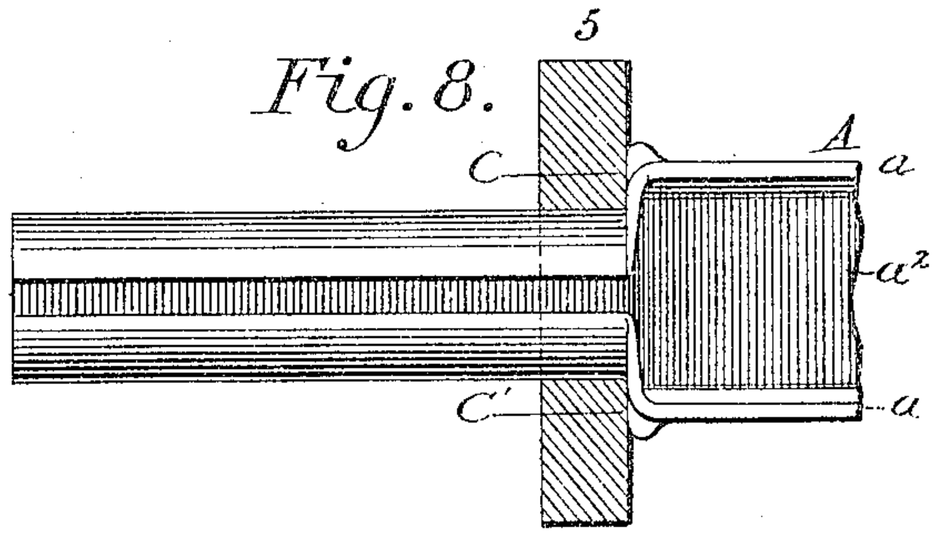


Fig. 9.

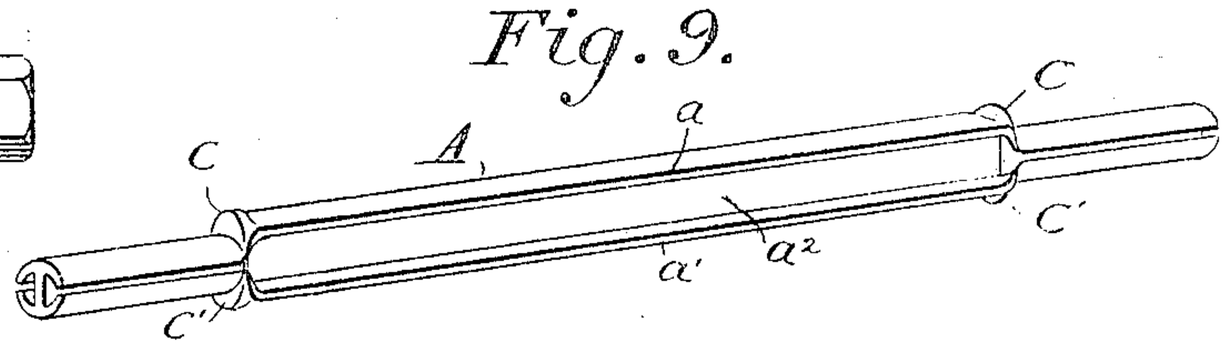


Fig. 10. Fig. 11. Fig. 12. Fig. 13.

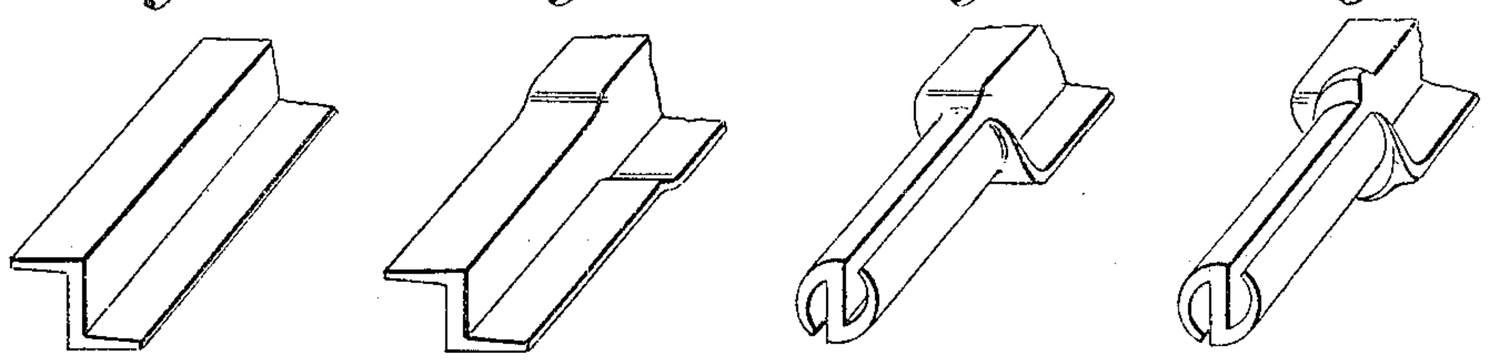
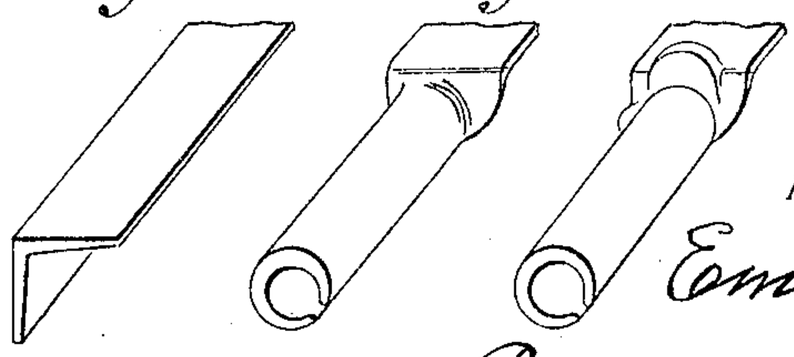


Fig. 14. Fig. 15. Fig. 16.



WITNESSES

P. F. Barnes.

D. E. Burdine

INVENTOR

Emil Einfeldt

By P. G. Dodge Attorney

UNITED STATES PATENT OFFICE.

EMIL EINFELDT, OF DAVENPORT, IOWA, ASSIGNOR TO BETTENDORF METAL WHEEL COMPANY, A CORPORATION OF IOWA.

METHOD OF SHAPING METAL BARS.

No. 808,736. Specification of Letters Patent. Patented Jan. 2, 1906.

Original application filed November 9, 1904, Serial No. 232,054. Divided and this application filed March 17, 1905. Serial No. 250,649.

To all whom it may concern:

Be it known that I, EMIL EINFELDT, of Davenport, county of Scott, and State of Iowa, have invented a new and useful Improvement in Methods of Shaping Metal Bars, of which the following is a specification, being a division of original application filed November 9, 1904, Serial No. 232,054.

This invention relates to the shaping of flanged metal bars for the production more particularly of metal axles in which the bearing-spindles are integral continuations of the body of the axle; and the invention consists of the improved method of treating the bar by which its end is given the desired shape and form, as will be fully described in the specification, and the novel features defined in the claims.

In the accompanying drawings, Figure 1 is a sectional perspective view of the blank or bar which is to be shaped in accordance with my invention to form an axle. Figs. 2, 3, and 4 are sectional perspective views showing the blank or bar in its different stages of formation. Figs. 5, 6, 7, and 8 are sectional elevations showing how the blank is acted on by the several shaping devices. Fig. 9 is a perspective view of the result of the method. Figs. 10, 11, 12, and 13 are sectional perspective views illustrating a blank of a different form in its different stages of formation when subjected to the successive steps of my method. Figs. 14, 15, and 16 are similar views showing a blank of still another form in its different stages of formation when treated in accordance with my invention.

Referring to the drawings, in carrying my invention into effect I provide a blank A, Fig. 1, preferably a section of commercial I-beam, consisting of the two parallel flanges *a a'* and the central connecting-web a^2. The end of this blank is first subjected to pressure in the direction of the plane of the web and transversely of the length of the blank, which action will result in reducing the height of the web at its end and increasing its thickness transversely, as shown in Fig. 2. The flanges of the reduced end of the blank are next bent inward toward each other into rounded form, as shown in Fig. 3, producing a bearing-spindle comprising the thickened web portion and curved flanges, sloping shoulders B B' being formed where the curved flanges unite with the flanges of the body of the bar. I next upset the bar endwise at the point where the sloping shoulders are situated, which action will result in the formation of two abrupt shoulders C C', Fig. 4, which abrupt shoulders consist of the upset metal of the sloping shoulders. This completes the operation, and when the two ends of the blank are acted on in this manner an axle is produced of the form represented in Fig. 9.

Any appropriate mechanism may be employed in treating the bar in the manner described to carry my method into effect; but I have found in practice that good results are obtained by first passing the end of the blank between opposing reducing-rollers 1 and 2, Fig. 5, in order to reduce the bar locally and thicken the web, then between shaping-rollers 3 and 4 in order to bend the flanges to give the end of the bar a rounded form, and, finally, within an upsetting-die 5, Fig. 8, in order to upset the metal of the sloping shoulders and throw up the abrupt shoulders where the rounded spindle joins the body of the bar.

I prefer to heat the end of the bar before subjecting the same to the action of the shaping devices. It will be observed that in the practice of my method the bar or blank is reduced in height locally, the flanges of the reduced portion curved to present a general rounded contour, and these flanges where they join the flat flanges of the body of the bar are upset endwise to form an abrupt bearing-shoulder to receive the end thrust of the wheel.

While in the drawings I have shown the blank of I form in cross-section and have illustrated and described the shaping mechanism as adapted to act on a blank of this form, it will be understood that the invention is applicable as well for shaping flanged bars of other cross-sectional forms. For instance, the blank may be of ⊤ form, consisting of two longitudinal flanges extending in opposite directions from the edges of a connecting-web. My method as applied to a blank of this character will operate substantially as described in connection with the I-beam, the first action reducing the height and increasing the thickness of the web, the second action rounding the flanges of the reduced portion, and the third action throwing up and upsetting shoulders at the junction of the rounded and flat flanges. A blank of this character in its different stages of formation is illustrated in Figs. 10, 11, 12, and 13. In Figs. 14, 15,

and 16 I have shown still another form of blank in its several stages of formation to produce an axle. In this case the blank used is of ⌐ form in cross-section, comprising two longitudinal angularly-disposed connected flanges. In subjecting this bar to my improved method the flanges at the ends are subjected to lateral pressure, which will act to bend them in toward each other, as shown in Fig. 15, the blank thus having its end reduced into rounded form, after which it is subjected to endwise pressure and a shoulder upset at the junction of its reduced end with the body of the bar.

Having thus described my invention, what I claim is—

1. The method of shaping flanged bars which consists in subjecting the bar to a lateral pressure to reduce its height locally, and rounding the flanges of the reduced portion.

2. The method of shaping flanged bars which consists in subjecting the same to lateral pressure at the end to reduce its height, rounding the flanges of the reduced portion of the bar, and subjecting the same to endwise pressure to form a shoulder.

3. The method of making metal axles which consists in selecting a bar having longitudinal flanges and a connecting-web, reducing the height of the web at the end of the bar and thereby increasing the thickness of said web, and bending the flanges of the thickened portion of the web inward to form a rounded surface and to leave longitudinal spaces between the web and the bent flanges.

In testimony whereof I hereunto set my hand, this 13th day of March, 1905, in the presence of two attesting witnesses.

EMIL EINFELDT.

Witnesses:

M. LOUISE DODGE,

ANDREW NEILSON.