

WILLIAM A. LEWIS.

3 Sheets--Sheet 1.

Improvement in the Manufacture of Ribbed Metal Plates
of which to Construct Hollow Car-Axles.

No. 124,834.

Patented March 19, 1872.

FIG. 1.

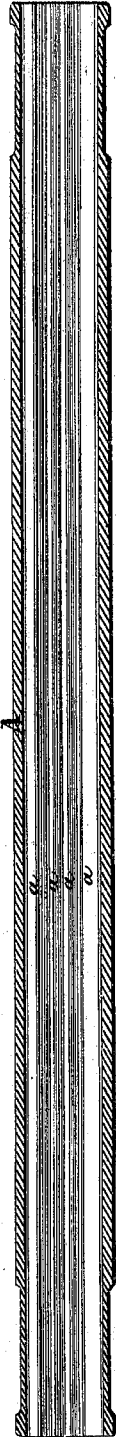


FIG. 2.

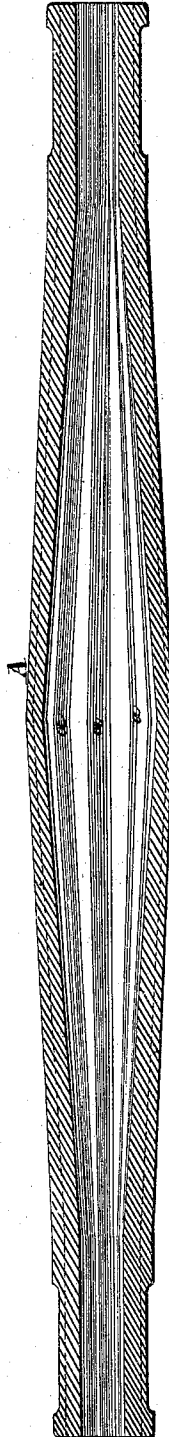


FIG. 4.

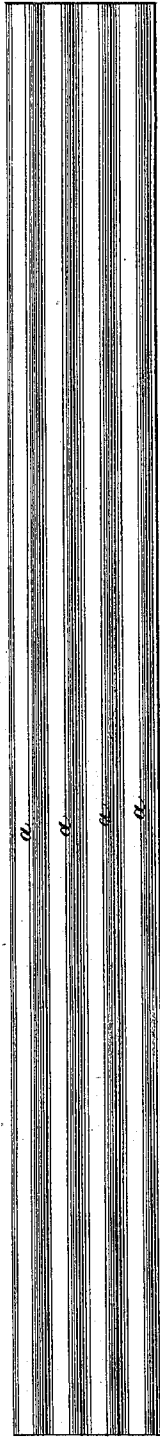


FIG. 5.

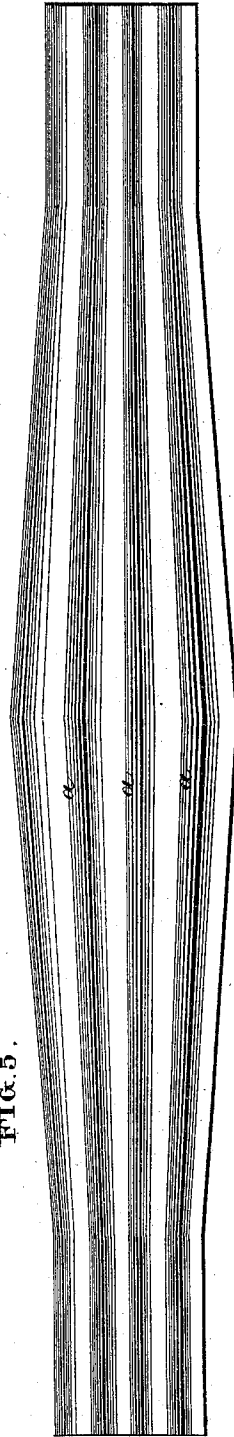


FIG. 3.



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FIG. 8.

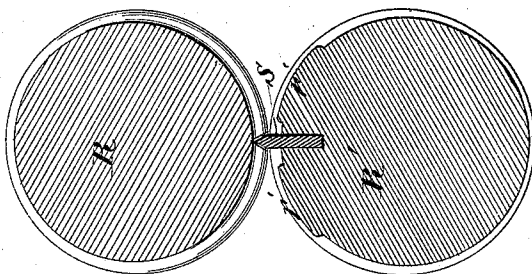


FIG. 7.

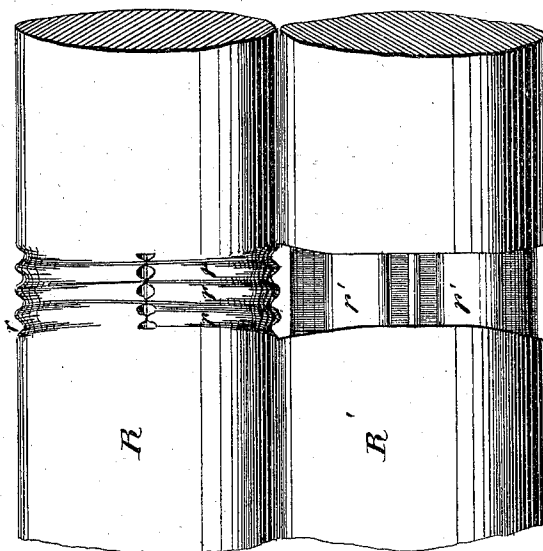
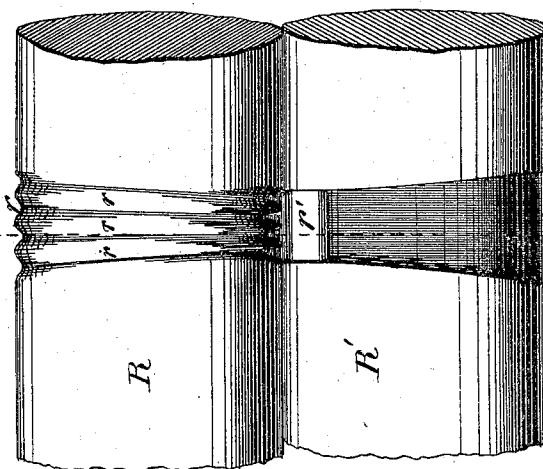


FIG. 6.



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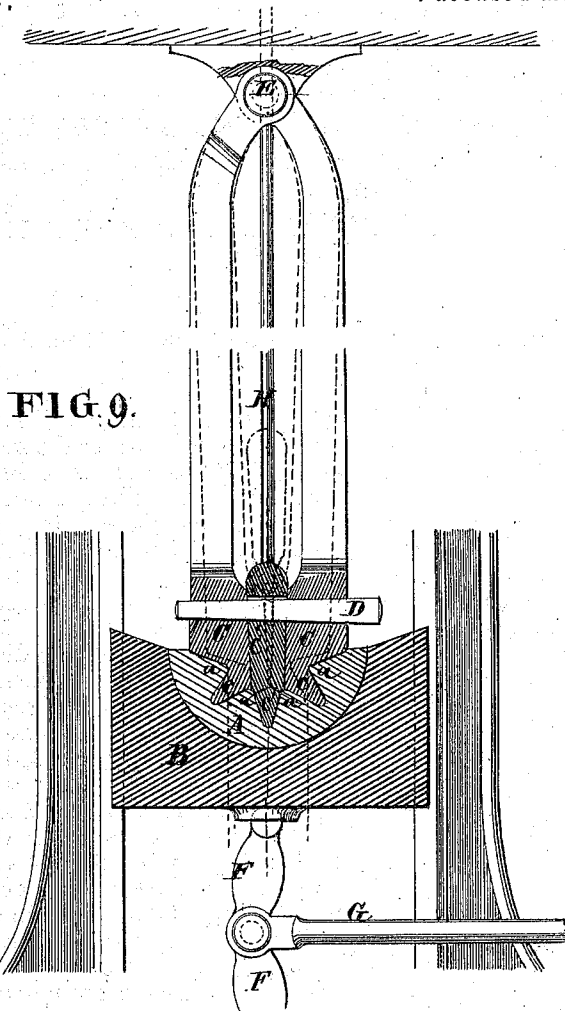


FIG. 9.

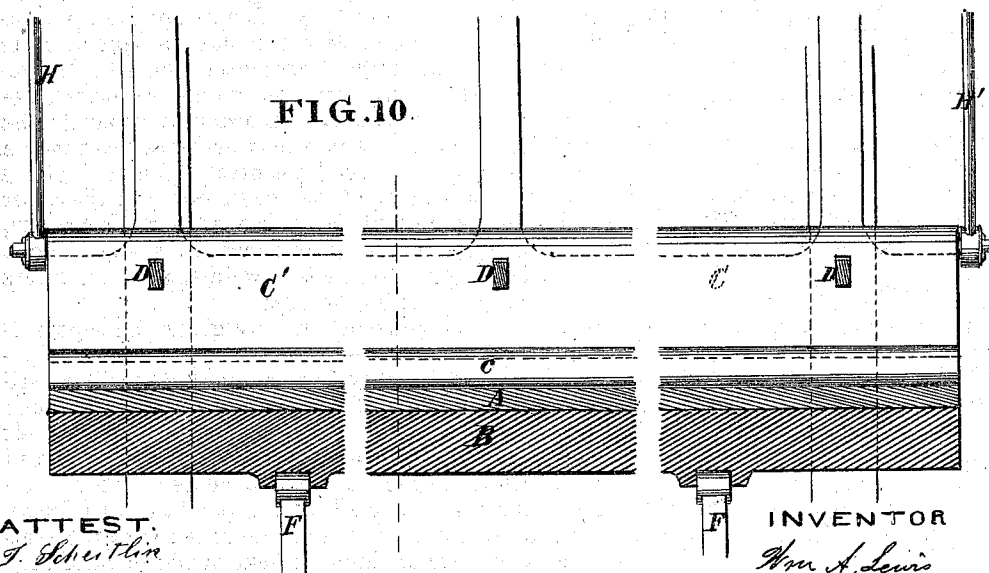


FIG. 10.

ATTEST.
J. Scherlin
Wm A. Lewis

INVENTOR
Wm A. Lewis
By [Signature]

UNITED STATES PATENT OFFICE.

WILLIAM A. LEWIS, OF CHICAGO, ILLINOIS, ASSIGNOR TO HOLLOW-AXLE MANUFACTURING COMPANY, OF MISHAWAKA, INDIANA.

IMPROVEMENT IN THE MANUFACTURE OF RIBBED METAL PLATES OF WHICH TO CONSTRUCT HOLLOW CAR-AXLES.

Specification forming part of Letters Patent No. 124,834, dated March 19, 1872.

Specification describing an Improved Process for the Manufacture of Hollow Metallic Axles, invented by WILLIAM A. LEWIS, of Chicago, in the State of Illinois.

My process consists in rolling plates or bars with longitudinal ribs on that side which is to form the interior of the axle and subsequently bending the ribbed plates or bars into the necessary concavo-convex shape between dies, one member of which is formed of two or more detachable parts adapted to form and fit within the ribbed concavity of the bar and be subsequently withdrawn therefrom, as hereinafter described.

In the accompanying drawing, Figure 1 is a longitudinal section of a parallel-sided axle illustrating the product of my invention, the section being taken through the grooves, and indicated by the line *x x*, Fig. 3. Fig. 2 is a similar section of a tapered axle, the section being taken through the ribs, as indicated by the line *y y*. Fig. 3 is a transverse section of the parallel-sided axle. Fig. 4 is a plan of one of the flat-ribbed plates to form a section for the axle shown in Fig. 1. Fig. 5 is a similar view of a plate for the axle shown in Fig. 2. Fig. 6 is an elevation of portions of a pair of rolls adapted for forming the ribbed plates. Fig. 7 is an elevation of the same in another position. Fig. 8 is a transverse section thereof. Fig. 9 is a transverse section on a larger scale of the dies employed to bend the plates into segment form. Fig. 10 is a longitudinal section of same.

General Description.

A represents the axle in its various forms, and *a* the internal longitudinal ribs formed therein, which are likewise shown in the flat metal plates represented in Figs. 4 and 5. R R' are a pair of rolls adapted to form the ribbed plates or bar shown in Fig. 5. The upper roll R is formed with a number of circumferential grooves, *r*, which produce the ribs *a*. The lower roll R' has a large groove with a plain bottom to form the smooth exterior face of the bar, and at proper points within this groove are projections *r'*, which produce depressions

at proper points for the journal-surfaces. S is a cutter to sever the bar into the requisite lengths. Referring to Figs. 9 and 10, B represents the matrix or female die for forming the ribbed plates into segments or axle-sections. C C C' represent the three parts of the follower-die, which is formed with ribs *c*, adapted to project between the ribs *a* of the plates. D is a key for securing the sections C C C' of the follower-die together. E is a pivot, on which the outer sections C C are adapted to swing. F F represent toggle-levers for forcing up the matrix-die B. These may be operated by a connecting-rod, G, attached to a crank, or by other suitable mechanism. H H are lifting-rods attached to the ends of the central section C' for the purpose of withdrawing it when the parts are to be separated. A ribbed plate having been prepared of the necessary shape and dimensions, is laid in a heated state, with its smooth face down and its ribbed face up, upon or over the matrix-die B. The parts of the follower-die C C' having been secured by the key D, the matrix-die B is then forced up by the appropriate mechanism, by which action the plate is bent into the segmental form represented, the ribs B projecting into the grooves which are formed between the ribs *a*. In order to separate the parts of the die it is now necessary to remove the key D, when the central member C' of the follower-die may be taken out and the outer members C will fall together by their gravity, or may be readily detached by a slight blow. The segment-plate is now finished in readiness for the welding process.

In the illustration here given the segment-plate will be seen to form an arc of one hundred and eighty degrees, so that it will constitute one-half of the hollow shaft. Two such segment-plates being now adjusted, with their edges together and suitably wired, are placed in the furnace, and when heated to the welding temperature they are partially withdrawn therefrom; but while remaining within the atmosphere or flame or heat of the furnace they are introduced between suitable dies and instantaneously pressed together in the manner

described in a separate application which I have made for Letters Patent.

Claim.

I claim as my invention—

The process herein described for producing sections for hollow axles with ribbed interior surface by rolling ribbed plates and subsequently bending them between dies B C C of substantially the character specified.

To the above specification of my improvements in process and apparatus for constructing axles I have set my hand this 5th day of July, 1871.

WM. ARNOLD LEWIS.

Witnesses:

OCTAVIUS KNIGHT,
WALTER ALLEN.