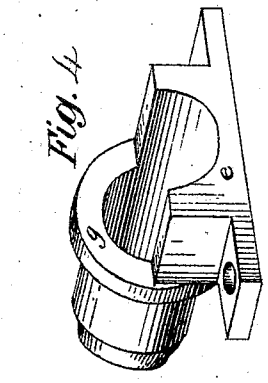
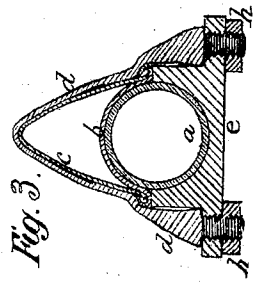
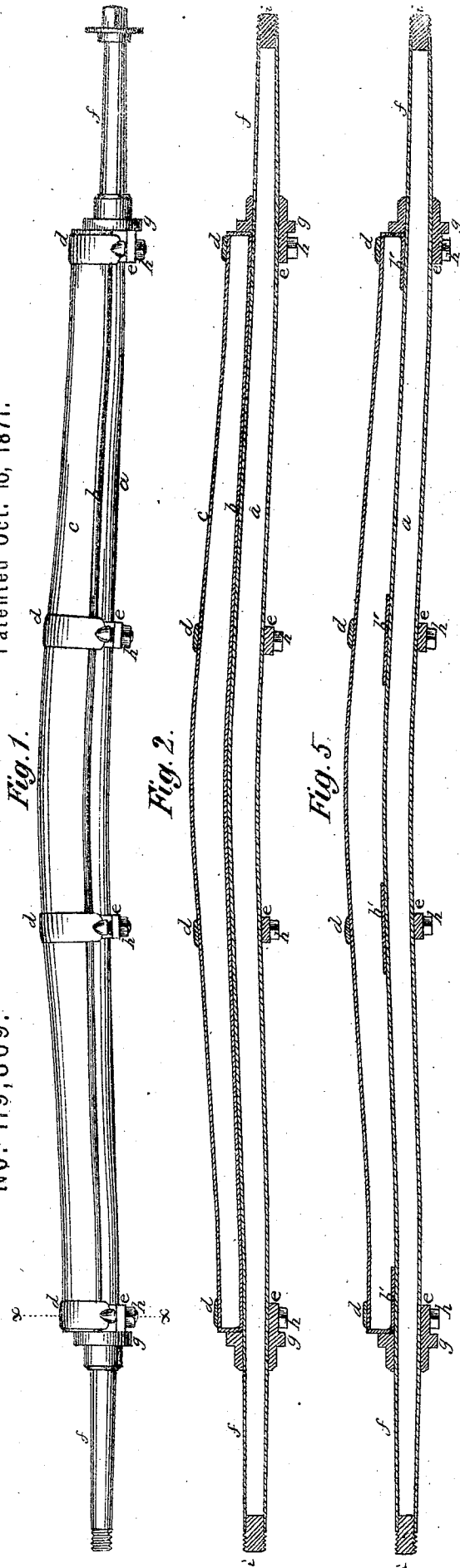


William A. Lewis. *Tubular Double-Arch Axle for Wagons, &c.*

No. 119,869.

Patented Oct. 10, 1871.



Witnesses:
Fred. A. [unclear]
J. C. R. [unclear]

Inventor:
Wm. A. Lewis

UNITED STATES PATENT OFFICE

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

IMPROVEMENT IN TUBULAR DOUBLE-ARCH AXLES FOR WAGONS.

Specification forming part of Letters Patent No. 119,869, dated October 10, 1871.

To all whom it may concern:

Be it known that I, WILLIAM A. LEWIS, of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Combined Double-Arch and Tubular Axle for Wagons, Carriages, &c.; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing which forms a portion of this specification, of which—

Figure 1 is a side view; Fig. 2, a longitudinal section; Fig. 3, a full-sized transverse section in the dotted line *xx* of Fig. 1; Fig. 4, a full-sized perspective view of a detached portion of said axle; and Fig. 5 is a longitudinal section of a modification of my said combined double-arch and tubular axle.

The principal feature of my said combined double-arch and tubular axle is the tube *a*, the end portions of which have, by any suitable process, been taper-swaged to the desired form of axle-journals *ff*; have also had annular journal-shoulders *g g* shrunk upon said tube; and have also, by said swaging process, had plugs *i i* firmly secured within the journal-tapered ends of said tube, as represented in Figs. 2 and 5 of the drawing, and as more particularly described in another patent of even date herewith; said plugs having their ends screw-threaded, so as to receive the nuts by which the wheels are secured.

Upon about the upper half of the periphery of the said tube *a*, and extending the entire distance thereupon between its journal-shoulders *g g*, I place a sheet-metal arch, *b*, the longitudinal edges of which are turned upward and inward, as shown in Fig. 3, and the ends thereof are turned upward, as shown in Fig. 2. Over the said arch *b* I place a second sheet-metal arch, *c*, of substantially the shape and proportions represented in the drawing, the longitudinal edges of which are received into the pockets or channels formed by the turned-upward and turned-inward longitudinal edges of the inner arch *b*, while the ends of the said outer arch *c* abut against the turned-up ends of the said inner arch *b* and against the resisting axle-shoulders *g g*, as represented in Figs. 2 and 5. When the said component parts of my double arch and tubular axle have been thus placed, the one upon the other, they are firmly united together into a perfect axle by a suitable number of em-

bracing-clamps or clips composed of upper and lower sections, *d e*, which are united to each other by means of screw-shanks from the upper clip-sections *d* passing through holes in suitable lugs or ears on the lower clip-sections *e*, and then receiving the requisite holding screw-nuts *h*, as shown in the drawing.

At each end of the arches *b c* the lower section *e* of the embracing-clips are cast in one piece with the journal-shoulders *g*, as shown in Figs. 2, 4, and 5. The turned-up ends of the inner arch *b* are firmly compressed between the inner faces of the journal-shoulders *g* and the ends of the outer arch *c*; and the shape of the said turned-up ends of the arch *b* is made to correspond with that of the ends of the outer arch *c*.

I do not intend to limit myself to any precise curvature of the respective arches *b c* of my improved double-arch and tubular axle. Neither do I intend to limit myself to the employment of any precise number or shape of the clamps or clips required for combining the double arches with the tubular portions of my said improved axle.

Fig. 5 of the drawing represents a modification of my double-arch and tubular axle. In this axle the inner arch *b* does not extend the entire distance between the journal-shoulders *g g*, but is divided into short sections *b' b'*, as many of said sections being employed as may be necessary to sustain the outer arch *c* and retain it in its proper relative position and combination with the tube *a*. I usually place the said arch-sections *b' b'* immediately within the embracing-clips *d e*.

I claim as my invention and desire to secure by Letters Patent—

1. As a new manufacture, my improved double-arch and tubular axle for wagons, carriages, &c., constructed of the tube *a*, the journal-shoulders *g g*, the arches *b c*, and the embracing-clamps or clips *d e*, substantially in the manner herein set forth.

2. The exterior shape given to my said improved axle by the arch *c* and the exposed portion of the tube *a*, substantially as herein represented and described.

WM. A. LEWIS.

Witnesses:

Z. C. ROBBINS,
JNO. D. PATTEN.

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