(No Model.)

T. C. MUNZ.

METHOD OF MAKING AXLES OF SHEET METAL.

No. 383,188. Patented May 22, 1888.

Fig. 1

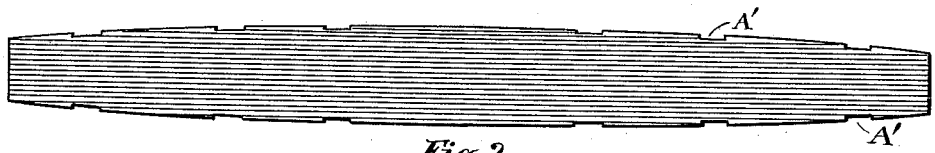

Fig. 2.

Fig. 3.

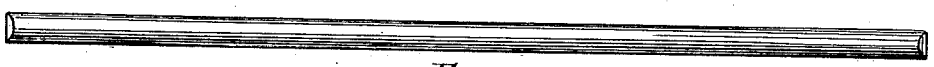

Fig. 4.

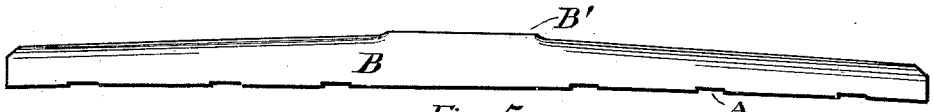

Fig. 5.

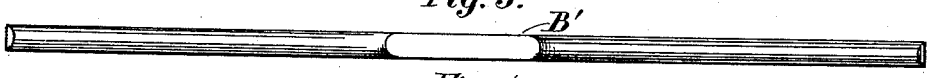

Fig. 6.

Witnesses.
C. J. Webster,
Wesley Smith.

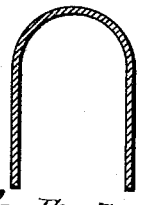

Fig. 7.

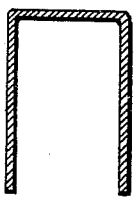

Fig. 8.

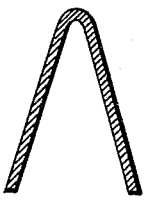

Fig. 9.

Inventor:
Theodore C. Munz,
By Wm. Webster.
Atty

UNITED STATES PATENT OFFICE.

THEODORE CHARLES MUNZ, OF TOLEDO, OHIO, ASSIGNOR OF ONE-HALF TO WARREN HENRY ELDRIDGE AND FRANKLIN HUBBARD, OF SAME PLACE.

METHOD OF MAKING AXLES OF SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 383,188, dated May 22, 1888.

Application filed September 13, 1887. Serial No. 249,602. (No model.)

To all whom it may concern:

Be it known that I, THEODORE CHARLES MUNZ, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in a Metal Axle and Method of Forming the Same; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My invention relates to metal axles for vehicles and the method of forming the same, and has for its object to produce an axle from sheet metal that shall be light, strong, and inexpensive of construction; and the invention consists in the axle herein described and the method of making the same, all as hereinafter specified, and particularly pointed out in the claims.

Heretofore vehicle-axles have been constructed of iron or steel forged to the desired shape, or of a cast or malleable cast. In either of the modes described there is necessarily a great weight of material to insure the desired strength, the first-mentioned mode also requiring skilled labor in the manufacture and a supplemental wood finish upon the upper side thereof, thereby involving great expense. In the last-mentioned construction there is great difficulty in cooling the cast axle and maintaining its proper shape.

The object of my invention is to obviate these difficulties by employing sheet metal, preferably sheet-steel, though not necessarily, as any sheet metal of sufficient rigidity is adaptable for this purpose, and by a simple process produce a finished axle, whereby the quality of the finished product shall be superior to that now produced and the cost of manufacture reduced.

Referring to the drawings, Figure 1 is a top view of a blank of sheet metal of the desired shape to produce an axle when properly formed, as hereinafter described. Fig. 2 is a like view, and shows the blank cut away at points where it is desired to attach clips. Fig. 3 is a side elevation of an axle formed of the blank shown in Fig. 2 after it has been subjected to a third step in the process. Fig. 4 is an elevation of the top of a finished axle. Fig. 5 is a side elevation of an axle, showing the central part rectangular in cross-section, the end portions being U-shaped in cross-section. Fig. 6 is an elevation of the top side of an axle constructed as shown in Fig. 5. Figs. 7, 8, and 9 are transverse sections showing some of the different forms of axles that may be constructed in accordance with my invention, it being understood that the interior longitudinal opening may be of any desired shape or form.

Like letters of reference indicate like parts throughout the views.

To construct an axle I take a sheet of metal of the desired thickness, and by the use of dies or other suitable means form a blank, A, of the desired surface area and form, and then preferably, though not necessarily, cut away from the sides of the blank a portion of the same corresponding to the shape and size of the clips to be employed in clasping the spindle in place, as shown at A′, and afterward form the same into the desired shape, whether it be of U shape in cross-section, as shown in Fig. 7, rectangular, as shown in Fig. 8, V shape, as shown in Fig. 9, or in any other desired form, so that there is an arched bearing-surface caused by the longitudinal opening through the entire length of the axle, thereby increasing the strength and reducing the weight.

The blank, when prepared as described, is placed between dies having cameo and intaglio forms of the desired shape, and pressed into shape by any power desired.

I may form the axle of the same general form in cross-section as shown in Figs. 3 and 4, B designating the finished axle, or with a rectangular central portion, as shown at B′ in Figs. 5 and 6, it simply being necessary to form the dies of corresponding shape.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The method herein set forth of making vehicle-axles, which consists in constructing a blank of the desired form out of sheet metal and then forming the same into the desired shape by pressure, as and for the purpose set forth.

2. A step in the art of making axles of sheet

metal, which consists of forming cut-away portions in the sides of the blanks corresponding to the position of the clip-plates previous to forming the same into the desired shape by pressure, as and for the purpose set forth.

3. A vehicle-axle formed of sheet metal pressed into the desired shape, as and for the purpose set forth.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

THEODORE CHARLES MUNZ.

Witnesses:
WILLIAM WEBSTER,
JAMES E. RAYMER.