(No Model.)

T. C. MUNZ.

VEHICLE AXLE.

No. 420,730. Patented Feb. 4, 1890.

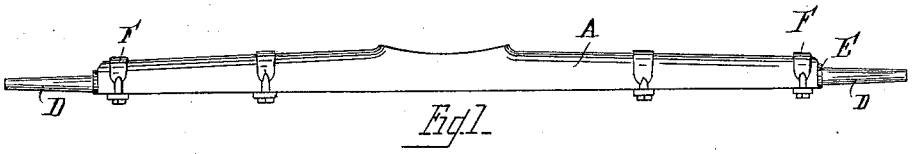

Fig 1.

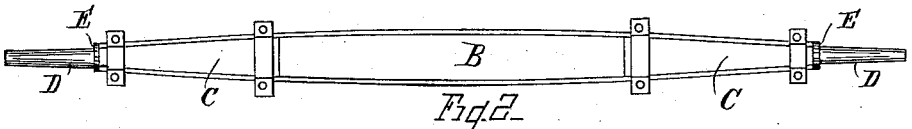

Fig 2.

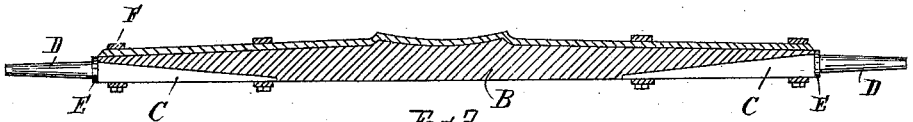

Fig 3.

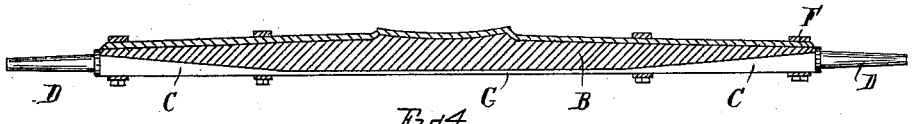

Fig 4.

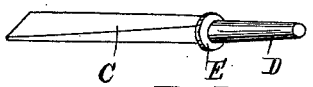

Fig 5.

WITNESSES.

Carroll J. Webster.
Anna J. Lehaney.

INVENTOR.

Theodore C. Munz
By William Webster
Atty

UNITED STATES PATENT OFFICE.

THEODORE C. MUNZ, OF TOLEDO, OHIO, ASSIGNOR TO THE AMERICAN STEEL GEAR COMPANY, OF SAME PLACE.

VEHICLE-AXLE.

SPECIFICATION forming part of Letters Patent No. 420,730, dated February 4, 1890.

Application filed December 7, 1889. Serial No. 332,904. (No model.)

To all whom it may concern:

Be it known that I, THEODORE C. MUNZ, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in a Running-Gear for Vehicles; 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 running-gear for vehicles, and has more particular reference to the axles and spindles.

The object of the invention is to provide an axle of greater rigidity than heretofore, combined with lightness.

A further object is to provide an axle that can be finished without liability of the paint and varnish being fractured by torsional strain.

A further object is to provide an axle designed to receive an arm or spindle, of a formation to preclude the possibility of longitudinal movement within the same.

A further object is to provide an arm or spindle with an expanded inner end to conform to the contour of the axle, with a collar to abut against the end of the same to determine the width of tread of the wheels.

The invention consists in the parts and combination of parts hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 represents a side elevation of a complete axle. Fig. 2 is a plan view showing the spindles formed with expanded ends, secured therein by clips. Fig. 3 is a longitudinal vertical sectional view of the same. Fig. 4 is a longitudinal vertical sectional view of the axle with the spindles secured within the same and joined by an intermediate stiffening metal bar. Fig. 5 is a perspective view of one of the spindles formed with an expanded inner end.

My invention relates more particularly to that form of axle described and claimed in my patent dated May 22, 1888, and numbered 383,409, and has reference to securing an axle-arm therein, and to means of strengthening the axle by means of a wooden filling, and a supplemental metal cap to the under side thereof.

It has been found that a metal axle formed of sheet metal possesses all the rigidity of a tubular one, combined with lightness and economy of cost; but to guard against lateral strain there must be a supplemental filling, preferably of wood. This filling, being concealed, does not affect the finish of paint or varnish, thereby obviating a great objection heretofore urged of the paint cracking at the point of juncture of the metal and wood.

Heretofore in the class of axles to which my invention belongs there has been great difficulty in securing the arm of the spindle upon which the wheel runs in place, owing to the variance of contour of the spindle-arm and axle, and as a consequence the arm has been held solely by the friction caused by the clips contacting therewith.

The object of my invention is to form the axle with an increasing area in cross-section from the ends toward the center, thereby causing a gradual outward inclination to the interior, and then forming the arm of the spindle with an outward inclination or divergence to cause the same to fit closely within the inclined sides of the axle to prevent displacement longitudinally in the direction of the length of the axle, regardless of the clips, and by means of a collar at the termination of the spindle to prevent movement longitudinally in the direction of the center of the axle by reason of the collars abutting against the ends of the axle.

A further object is to form the inner ends of the arms of a width to be adapted to be joined to a bar of a width corresponding with the longitudinal opening of the under side of the axle, to wholly confine the wood filling within the channel of the same.

A designates an axle formed of a sheet of metal and pressed into the desired shape, which may be of U, V, rectangular, or any desired form in cross-section.

B designates a filling-piece, preferably of wood, and extending the entire length of the metal axle, this filling being designed to strengthen the axle from lateral strain, the

angle or curvature of the metal being sufficient to strengthen the same from the ordinary strain vertically caused by the weight of the usual load carried thereon.

C designates the arm of the spindle D, which, to obviate displacement either toward or from the center of the axle and thereby varying the width of tread of the wheels, is formed with an outward divergence or flattened flaring contour to correspond with the interior of the axle, and with a collar E to abut against the end thereof to prevent the inward movement of the arm.

In securing the arm of the spindle in place the flattened flaring end of the arm is placed between the sides of the axle, with the collar E abutting against the end thereof, the metal of the arm bearing against the wood filling and being held in place by clips F, the outer pair of which may be the shackles, to which the thills or pole is attached, and by this means the filling is securely held in place; and to further strengthen the center portion of the axle a bar of metal G may be welded or secured to the inner end of the arms, as shown in Fig. 4, which rests within the channel of of the axle, thereby wholly inclosing the wood filling-piece without detracting from the appearance of the axle or causing a fracture of the paint or varnish upon the same. In the latter construction the collars E abut against the ends of the axle and properly center the bar G and spindles D and hold the same from movement in either direction.

It will be seen from the above description that I form an axle and spindles capable of perfect finish by painting without joinder of the strengthening parts to appear in sight, and that the axle and arm with the spindles attached may be formed as an article of manufacture and be assembled without the aid of skilled labor, and that, if desired, the central bar may be of the exact width to be joined to the arms to supplement the filling-piece to add to the strength of the axle.

What I claim is—

1. In combination with an axle having angled sides and an open base portion, a filling-piece and a spindle having an arm formed to fit between the sides of the axle and bear upon the filling-piece, as and for the purpose set forth.

2. In combination with an axle formed with depending sides, forming an open base portion with a diverging cavity, arms formed with a flattened diverging contour to fill the cavity their entire length, as and for the purpose set forth.

3. In combination with an axle formed with a channel having a contraction from the center toward each end, a filling-piece and a metal bar of like contour located within the channel and terminating in spindles, as and for the purpose set forth.

4. In combination with an axle formed of sheet metal and having a channel upon the under side thereof with an oppositely-contracted contour, an arm formed with a collar to abut against the ends and a flaring portion to fit within the channel, and an arm upon the outer end, 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 C. MUNZ.

Witnesses:

WILLIAM WEBSTER,

ANNA J. LEHANEY.