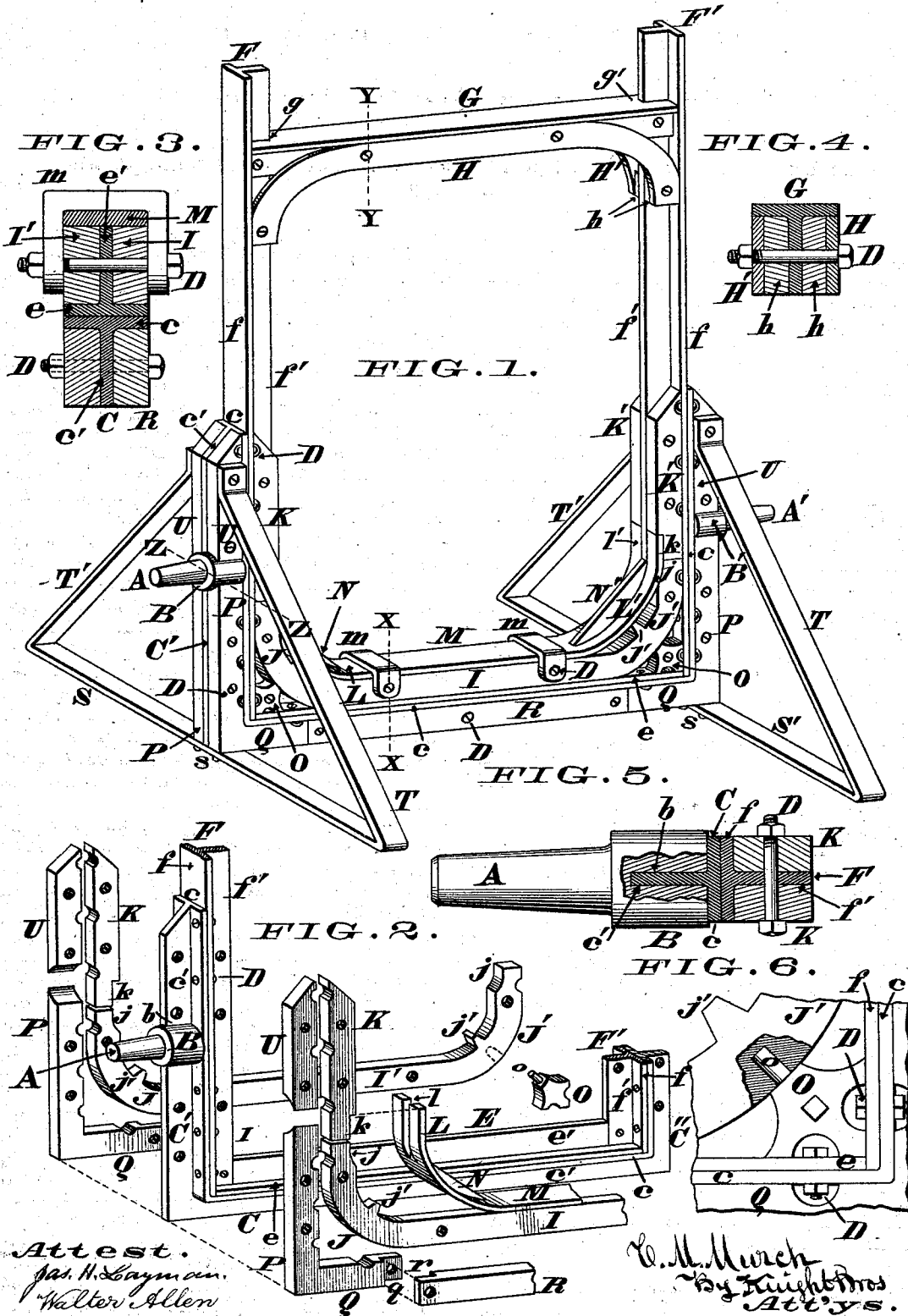


C. M. MURCH.
Axles for Vehicles.

No. 149,779.

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UNITED STATES PATENT OFFICE.

CHAUNCEY M. MURCH, OF CINCINNATI, OHIO.

IMPROVEMENT IN AXLES FOR VEHICLES.

Specification forming part of Letters Patent No. 149,779, dated April 14, 1874; application filed February 27, 1874.

To all whom it may concern:

Be it known that I, CHAUNCEY M. MURCH, of Cincinnati, Hamilton county, Ohio, have invented a new and useful Encircling and Braced Axle-Tree and Frame, of which the following is a specification:

The object of my invention is to provide drays, wagons, and other vehicles for transporting heavy loads, with an axle-tree which, though bent in such a manner as to bring the bed or platform of the vehicle as low down as practicable, is nevertheless as staunch and rigid as a common straight axle-tree extending directly across the bed or body.

To accomplish this result the downwardly-bent axle-tree is stiffened with a system of bracing, composed principally of angle-irons that are so thoroughly bolted or riveted together as to render it impossible for the spindles of the axle-tree to be sprung out of their proper positions, no matter how heavily the vehicle may be loaded, or how rough and uneven the roads may be along which it is propelled.

In order to render this downwardly-bent axle-tree more rigid and unyielding, so as to be adapted for use upon vehicles carrying the heaviest loads that can be drawn, it may be still further stiffened by the application of an angle-iron frame surrounding the wagon or car on both sides and also at top, the overhead portion of said frame being elevated sufficiently to allow a person to pass under it. I further so construct said frame as to be readily and quickly put together by simple bending and riveting of its component parts, none of which are of unwieldy form or dimension, and hence the entire frame can be put together by any blacksmith.

Having thus briefly indicated the prominent features of my improvement, I will now proceed to describe the same in detail.

In the accompanying drawings, Figure 1 is a perspective view of my bent and braced axle-tree frame in its most complete form, and ready for application to a vehicle of any kind, being adapted to encircle bed or body, as will presently appear. Fig. 2 is a perspective view, showing the various members of the

braced axle-tree separated from each other. Fig. 3 is a section at the line $x x$. Fig. 4 is a section at the line $y y$. Fig. 5 is a section at the line $z z$; and Fig. 6 is an elevation of one corner of the frame. Of the above views, Figs. 3, 4, 5, and 6 are drawn on an enlarged scale.

The spindles $A A'$ of the axle may be of any approved form, and they are respectively provided with short shanks $B B'$, having vertical slots $b b'$ cut in them. These slots enable the spindles to be welded or forged upon the side or vertical members $C' C''$ of a bent T-angle iron frame, $C C' C''$, whose lower horizontal portion C is designed to approach the ground as near as practicable. This T-angle iron frame, with its attached spindles, constitutes the axle-tree proper, and would, of itself, be stout enough to sustain any ordinary load; but as the object of my invention is to furnish an axle-tree capable of carrying any load that can be transported, it is evident said frame must be braced in the most secure and thorough manner, and I accordingly stiffen it by the following described system of braces.

By referring to Fig. 2, it will be seen that the axle-tree proper, $C C' C''$, is composed of T-angle iron, whose base c and web c' are perforated at suitable intervals for the reception of bolts or rivets D , wherewith the various braces are secured to said axle-tree. The first brace that is secured in position is a horizontal one, E , whose base e is bolted upon the base of the horizontal portion C of the axle-tree. After this two upright braces, $F F'$, are applied respectively to the vertical members $C' C''$ of the axle-tree, their bases f being fastened to the bases c of said vertical members. The lower ends of the uprights $F F'$ are notched or rabbeted, so as to fit snugly against the ends of the horizontal stiffener E , and said uprights are carried up some distance above the vertical members $C' C''$ of the axle-tree, which elevation is regulated by the height of the car or wagon that is to be suspended within the encircling frame. The upper portions of the uprights $F F'$ are united by a transom-brace, G , whose

base is notched at $g g'$, in order that said brace may be fitted to the webs of said uprights. Two bent iron struts, $H H'$, connect the uprights $F F'$ and transom G , filling blocks or plates h being interposed between these struts and the webs of said uprights and transom-brace, as indicated in Fig. 4. Two braces, $I I'$, are then bolted to the web e' of the horizontal member E , the lower edges of these braces resting upon the base e of said horizontal member. The ends of these braces are bent upwardly, as at $J J'$, said bent portions being securely riveted to the webs f of the uprights $F F'$. $K K'$ represent flat bars, which are continuations of the bent portion $J J'$, although capable of being separated therefrom, and said bars or plates, like the members $J J'$, are bolted to the webs f' . These flat bars are represented as being carried up as high as the vertical members $C' C''$ of the axle-tree, although they may be made much longer if desired, and in some cases they may abut against the ends of the transom-brace G , or its supporting-struts $H H'$. The contiguous ends of the bent portions $J J'$ and of the bars $K K'$ are notched, respectively, at $j k$, to receive upturned terminations $L L'$ of a flat plate, M , whose horizontal portion rests upon the upper edges of the web e' and of the braces $I I'$, said plate being secured in position by clips m and bolts D . These upturned portions $L L'$ are slotted at $l l'$, to receive the webs f' of the uprights $F F'$. Ribs $N N'$ prevent the curved portions $L L'$ losing their proper shapes. Projecting from the members $J J'$ are spurs or stirrups j , which bear against the extrados of the bent portions $L L'$ of the plate M . Interposed between the extrados of the curved members or knees $J J'$ and the braces $e f$ at the angles of the frame, are bracing-blocks O , having dowels o , that enter suitable sockets in the aforesaid members $J J'$, as more clearly shown in Fig. 6. Abutting beneath the shanks $B B'$ of the spindles, and bolted to the webs e of the vertical members $C' C''$ of the axle, are plates P , having right-angled projections Q , that fit up snugly against the base e of the horizontal member C of said axle. The intermediate plate R connects the opposing projections Q , as seen in Fig. 1. The contiguous ends of the plates $R Q$ are rabbeted, respectively, at r and q , in order that a common bolt may unite them to the web e' of the horizontal member C . $U U'$ are comparatively short plates, which rest upon the upper surfaces of the shanks $B B'$ and extend up to the tops of the vertical members $C' C''$ of the axle proper, and are bolted to the webs of the latter.

For some forms of vehicle I may add to the above features longitudinal bars $S S'$, which, being firmly secured to the angle-pieces $P Q$ by bolts s , inclined obliquely upward at $T T' T'' T'''$, are united to the upper parts of the plates P by means of bolts or

rivets t . These longitudinal struts $S T T' S' T'' T'''$ may be united to supporting or drawing spring-plates and serve to support or draw the vehicle.

The bed or body of the vehicle may rest upon and be firmly attached to the lower horizontal member $M I$ of the frame, or may be upheld any desired distance therefrom by means of suitable springs or cushions resting upon the portions $m m$, and attached thereto or to some other portion of said horizontal member.

It will be seen that this form and construction of axle-tree permit the spindle or axles to be located at any desired height upon the vertical portion, so as to bring the member C and its supported bed at any desired proximity to the ground, and that the continuation upward of the vertical portions $C' C''$, and their connection at top by the transom G , secure as much rigidity to the spindles as if the tree were simply rectilinear, as in the common way, in which case, of course, the bed must necessarily be as far from the ground as the radius of the wheels added to the half-thickness of the axle-tree; and it is further manifest that the said encircling axle-tree, being composed wholly of comparatively small, cheap, and easily procurable, and readily-handled sections of bar and angle iron, such as can be procured in any hardware-store and put together in any blacksmith's shop, can be manufactured without heavy and expensive swaging, welding, or forging operations, and likewise, should any part give out, it can be easily replaced.

It is also apparent that my said construction combines great strength with the smallest practicable expenditure of material and weight.

In the drawing the side plates P and U are shown as separable; but it is evident they may be composed of a single continuous piece of metal suitably bent or bowed to embrace or surround the shanks of the spindles, thereby greatly increasing the permanency of the junction of said shanks with the vertical members of the axle-tree.

A further modification may be produced by forging the spindle-shanks $B B'$ the members $C' C''$ of the axle, and the side plates $P U$, together, thereby dispensing entirely with rivets and practically rendering the axle and its stiffening-braces a single piece of unyielding metal.

This encircling frame being so rigid and unyielding enables me to apply any system of springs to said frame at the most effective point.

These supporting-springs may be attached to the top, bottom, or side members of said frame, as may be most convenient or effective.

I claim herein as new and of my invention—

1. The encircling axle-tree, consisting essentially of the rectangular frame C C' C'' G, the braces E F F' I I', knees J J', struts H H', bars K K', plate M m, ribbed and upturned portions L N L' N', and clips m m', the spindle A having shanks B for attachment at any desired height to the vertical portions C' C'', all combined substantially as set forth.

2. The supporting and stiffening plates O and P Q, in combination with the encircling axle C C' C'', substantially as and for the purpose set forth.

3. The bracing-blocks O, in combination with the curved braces J J', the dowels o of said blocks entering sockets in the extrados of the braces, as set forth.

In testimony of which invention I hereunto set my hand.

CHAUNCEY M. MURCH.

Attest:

GEO. H. KNIGHT,
JAMES H. LAYMAN.