(No Model.)

M. J. KLOPP & J. O. THERIEN.

VEHICLE AXLE.

No. 301,725. Patented July 8, 1884.

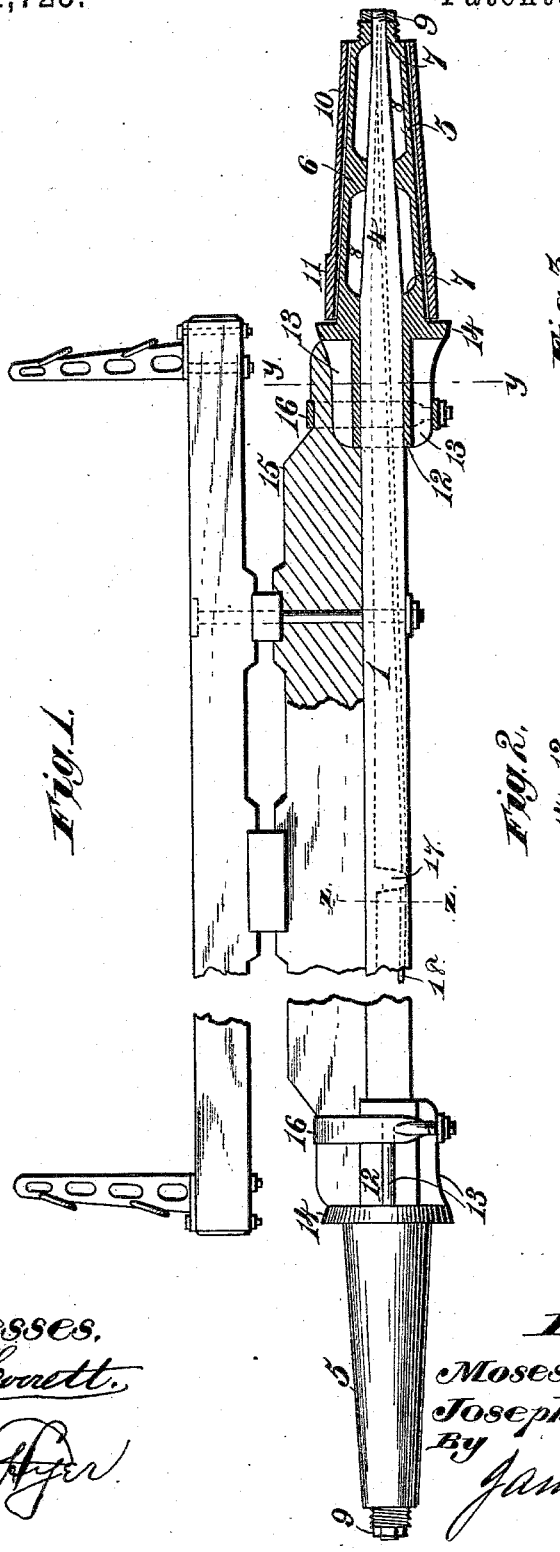

Fig. 1.

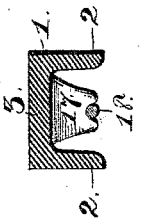

Fig. 3.

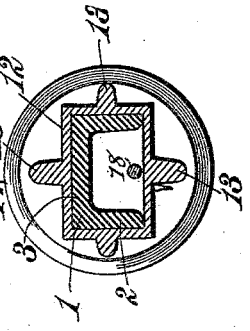

Fig. 2.

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UNITED STATES PATENT OFFICE.

MOSES J. KLOPP AND JOSEPH O. THERIEN, OF MINNEAPOLIS, MINNESOTA.

VEHICLE-AXLE.

SPECIFICATION forming part of Letters Patent No. 301,725, dated July 8, 1884.

Application filed April 9, 1884. (No model.)

To all whom it may concern:

Be it known that we, MOSES J. KLOPP and JOSEPH O. THERIEN, citizens of the United States, residing at Minneapolis, Minnesota, have invented new and useful Improvements in Axles for Vehicles, of which the following is a specification.

Our invention relates to axles for carriages and wagons, and has for its purpose to provide an iron axle having the maximum of strength with the minimum of metal, and in which the welding in the center is dispensed with.

It is also the purpose of our invention to provide a grooved iron axle with a thimble-skein, which can be easily put on, in which great strength is obtained with a comparatively small volume of metal, and in which the wear upon the parts is diminished and the weight and cost of the metal employed are lessened.

The invention consists in the novel construction and combination of devices hereinafter described and specifically claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a view, partly in elevation and partly in section, showing our invention. Fig. 2 is a transverse section of Fig. 1 upon the plane 2 2 *y y;* and Fig. 3 is a similar section on the plane *z z* of Fig. 1.

In the said drawings, the reference-number 1 indicates the axle-body, which is formed of metal, preferably by rolling out a plate of suitable thickness and width into the form shown in cross-section in Fig. 2. This construction gives the axle two vertical sides, 2 2, united by a web, 3, imparting to it nearly the strength, if not quite, of a rectangular or cylindrical body of solid metal having the same diameter. This construction gives an iron axle which is fully as strong as if it were made of solid metal, and enables us to dispense with the welding in the center of said axle, as has been practiced heretofore. Upon the spindle 4 of the axle is mounted a thimble-skein, 5, having the following construction: The skein is tapered, to conform to the conical shape of the axle, and is supported centrally by a bridge-piece, 6, bearing upon the spindle, and at each end by a bearing, 7, having like support, the metal between these points being removed, leaving an annular space, 8, between each end bearing and the central bridge-piece, 6. This gives a high degree of strength with the lowest possible weight of metal. The skein 5 is held upon the spindle by a nut, 9, threaded upon the end of the latter. The box-iron 10 is, as usual, fixed in the hub of the vehicle-wheel, and is adapted to be slipped over the skein, and is provided with splines 11, and is substantially of the construction heretofore known.

Integral with the skein 5 is a box, 12, surrounding the axle, and strengthened by ribs or fins of metal, 13, on each side, said ribs being supported by union with a collar, 14, which is formed at the inner end of the skein. These ribs impart great strength to the surrounding box 12, and entirely obviate the breaking of the axle near the collar. The upper rib upon the iron box 12 is set within a recess in the end of the wooden body 15 of the axle, and clips 16 are passed around both, firmly binding the skein in place, and at the same time uniting the iron recessed axle 1 with the wooden portion 15. By our invention we provide an axle and skein having great strength and lightness, the axle-body being continuous throughout without welding, and being so braced at its extremities that all danger of fracture inside the collar is effectually avoided. Moreover, by the substantial economy in the consumption of metal, we are enabled to greatly lessen the cost of manufacture.

In order to strengthen the axle when it is grooved, as shown, we provide a bridge-piece in the groove at or near the center of its length, and arrange a truss-rod thereon, the ends of the rod being welded to the ends of the axle within the groove. The truss-rod will impart additional strength to the structure, while, being in the groove, it will be concealed from view, so that the axle has the appearance of an ordinary axle without a truss.

Having thus described our invention, what we claim is—

1. The hollow metallic axle constructed on its interior with the concealed pendent bridge 17, in combination with the truss-rod 18, bearing against the bridge and having its extremi-

ties welded directly to the interior of the axle at the end or spindle portion thereof, substantially as described.

2. A hollow metal axle consisting of two vertical webs, 2, disconnected at their lower edges to provide a bottomless body, and united at their upper portions by a flat-faced web, to support the squared wooden body 15, said axle having a pendent bridge-piece within it, in combination with a truss-rod, 18, substantially as described.

3. A hollow metallic axle composed of the top web, 3, and vertical webs 2, disconnected at their lower edges to provide a bottomless body, and constructed with the interior bridge-piece, 17, in combination with the truss-rod 18, resting against the bridge and having its ends welded to the interior end portions of the axle, substantially as described.

4. The combination, with the angular axle having the attached wooden body 15 and the tapering spindle, of the axle-skein 5, constructed with the interior projecting annular bearings, 7 7, at the inner and outer ends, respectively, and the annular bridge-piece 6 centrally between the said end bearings to create the two intervening annular spaces 8, said skein having at its inner end the box fitting the angular axle, and provided with a rib, 13, entering the wooden body of the axle, substantially as shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

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