(No Model.)

J. SADLER.

CARRIAGE AXLE.

No. 362,184. Patented May 3, 1887.

Fig. 1.

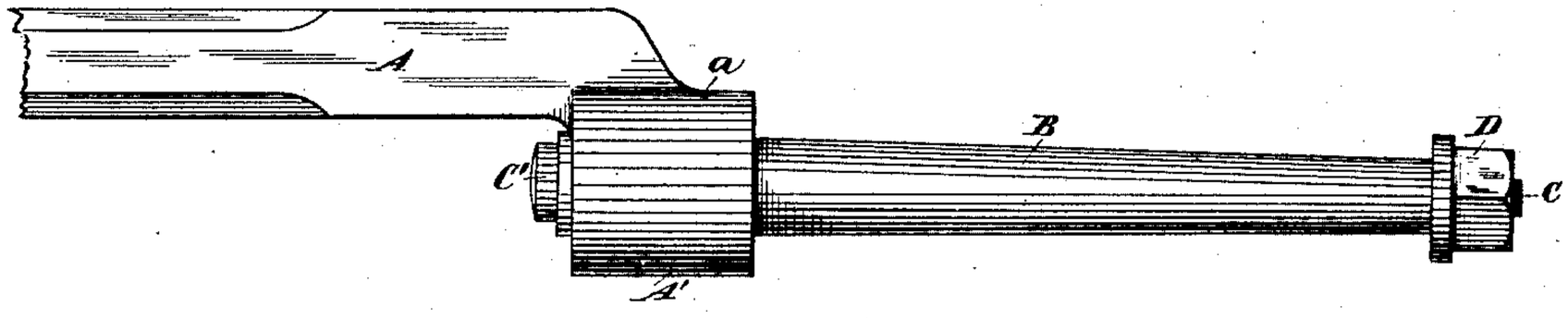


Fig. 2.

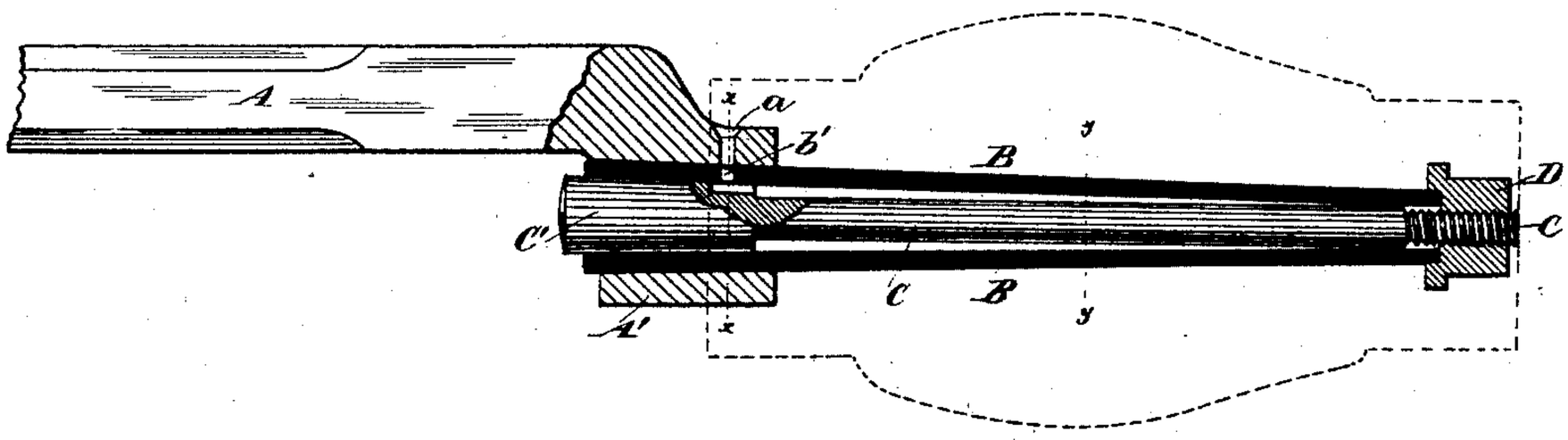


Fig. 3.

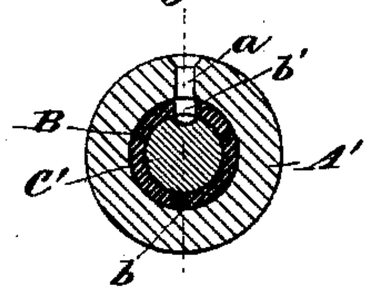


Fig. 4.

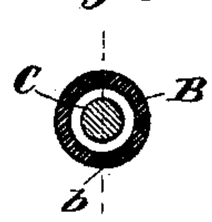
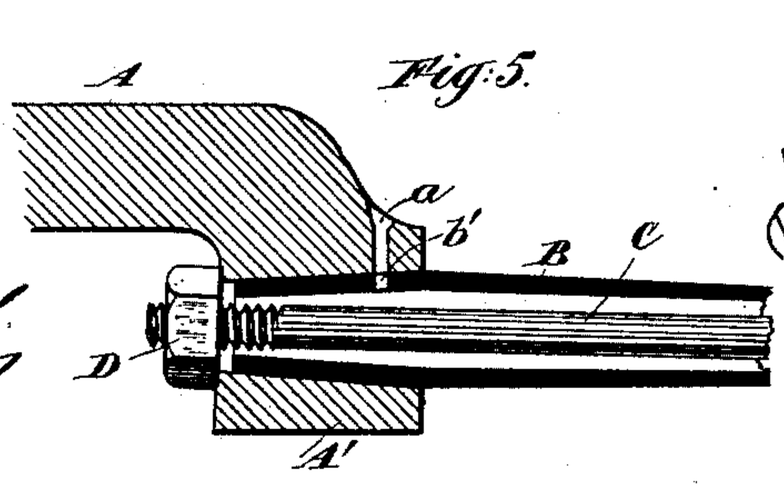


Fig. 5.



Witnesses:

N. Clay Smith

J. C. Lathrop

Inventor:

James Sadler
by his attorney
Thomas Drew Stetson.

UNITED STATES PATENT OFFICE.

JAMES SADLER, OF NEW YORK, N. Y.

CARRIAGE-AXLE.

SPECIFICATION forming part of Letters Patent No. 362,184, dated May 3, 1887.

Application filed September 25, 1886. Serial No. 214,521. (No model.)

To all whom it may concern.

Be it known that I, JAMES SADLER, of the city and county of New York, in the State of New York, blacksmith, have invented a certain new and useful Improvement in Carriage-Axles, of which the following is a specification.

I have devised a construction in which the axle-spindles are formed of sheet-steel bent into the proper conical form. These are set in corresponding tapering holes in the adjacent portions of the axles, and are distended and retained by a bolt extending through, but not filling, the hollow interior. Provisions are made for filling the remainder of the cavity with oil and for distributing it upon the axle-bearing.

The accompanying drawings form a part of this specification, and represent what I consider the best means of carrying out the invention.

Figure 1 is a side elevation; Fig. 2, a vertical longitudinal section; Fig. 3, a cross-section on the line *x x*, and Fig. 4 a cross-section on the line *y y* in Fig. 2. Fig. 5 is a longitudinal section of a portion showing a modification.

Similar letters of reference indicate corresponding parts in all the figures where they occur.

A is the body of the axle, and A′ an offset or short arm. In the latter is produced a tapered socket, the small end outward, adapted to receive and match to the large end of the spindle or hollow arm B, which is thrust from the inner end outward.

C is a bolt having a head, C′, and a nut, D. The head is tapered to match the interior of the large end of B. Screwing the nut on tightly by its pressure against the small end of the arm B transmits through the bolt C a strong endwise force to the tapered head C′. This matches in the correspondingly-tapered interior of B and distends it into firm contact with the offset A′.

An outline of the hub is shown in dotted lines. It will be understood that the hub is lined with a sleeve or skein of cast-iron or other metal, as usual.

The arm should be of cast-steel hardened, with the temper drawn somewhat near the large end. It is produced by bending a sheet of rolled steel of the proper tapering form and dimensions. A slight crack or opening is left between the abutting edges, as indicated by *b*. An oil-hole is bored in the large end at the opposite side, as indicated by *b′*. This hole, when the parts are in place, matches with the oil-hole *a*, through which oil may be supplied at intervals. The space in the tapering interior not occupied by the bolt may receive and retain a considerable quantity of oil, which will be available to lubricate the rubbing-surfaces for a long period.

In mounting the hollow arms B in the sockets in A′ care should be taken to bring the oil-passages into connection, and these should be so located that the joint between the abutting edges will be on or near the lowest line in the spindle, so as to continue to make available the lubricating-fluid so long as any remains in the cavity.

The oil-hole *a* may be drilled in the obvious manner. The oil-hole *b′* may be similarly drilled, if preferred.

There is a groove extending along the exterior of the tapered head C′, which leads the oil from *b* into the interior of the hollow arm B.

The hollow arm B thus made and fitted possesses great strength. I consider them stronger than ordinary solid arms.

Modifications may be made in the forms and proportions. Instead of leaving the joint open between the abutting edges, there may be a series of small holes. It is only essential that there be liberal provision for the oil to pass from the interior to the exterior of the hollow arm, and that these provisions be at or near the lowest point. I can, with due precautions, weld the edges of B together, making either a butt-weld or a lap-weld.

Instead of making the arm B of steel which is thicker at the large end, as shown, I can have it all of equal thickness throughout.

In the modification shown in Fig. 5 the hole in the offset A′ is tapered in the opposite direction, and the portion of the hollow arm B which enters it is tapered to match, while the remainder is tapered in the opposite direction, as usual. In this form the nut D bears against A′.

I attach importance to the internal bracing of the arm B by the correspondingly tapering head C′ of the bolt or spindle C. The parts should be so proportioned that the inner end of the head does not coincide with the end of the exterior bearing of B. The head should be a little short, as shown, or considerably longer, so as to extend beyond the bearing. The non-coincidence of the internal and external bearing tends to prevent the concentration of shocks, and thus to reduce the tendency to cracking along the line where the bearing stops.

I claim as my invention—

1. A carriage-axle having tapering sockets, in combination with separate hollow tapering arms B, internal spindles or bolts, C, each having a tapering head, C′, and nuts D, arranged to serve substantially as herein specified.

2. In a carriage-axle, a taper hollow arm, B, formed of sheet metal, with an opening, as *b*, along the bottom and an opening, as *b′*, near the large end for receiving oil, in combination with the bolt C C′ and nut D, and with the body A and offset A′, provided with an oil-hole, *a*, communicating with *b′*, as herein specified.

In testimony whereof I have hereunto set my hand, at New York city, New York, this 20th day of September, 1886, in the presence of two subscribing witnesses.

JAMES SADLER.

Witnesses:

A. FRED. SILVERSTONE,

RICHARD NEWELL.