

(No Model.)

H. KILLAM.
Carriage Axle.

No. 241,376.

Patented May 10, 1881.

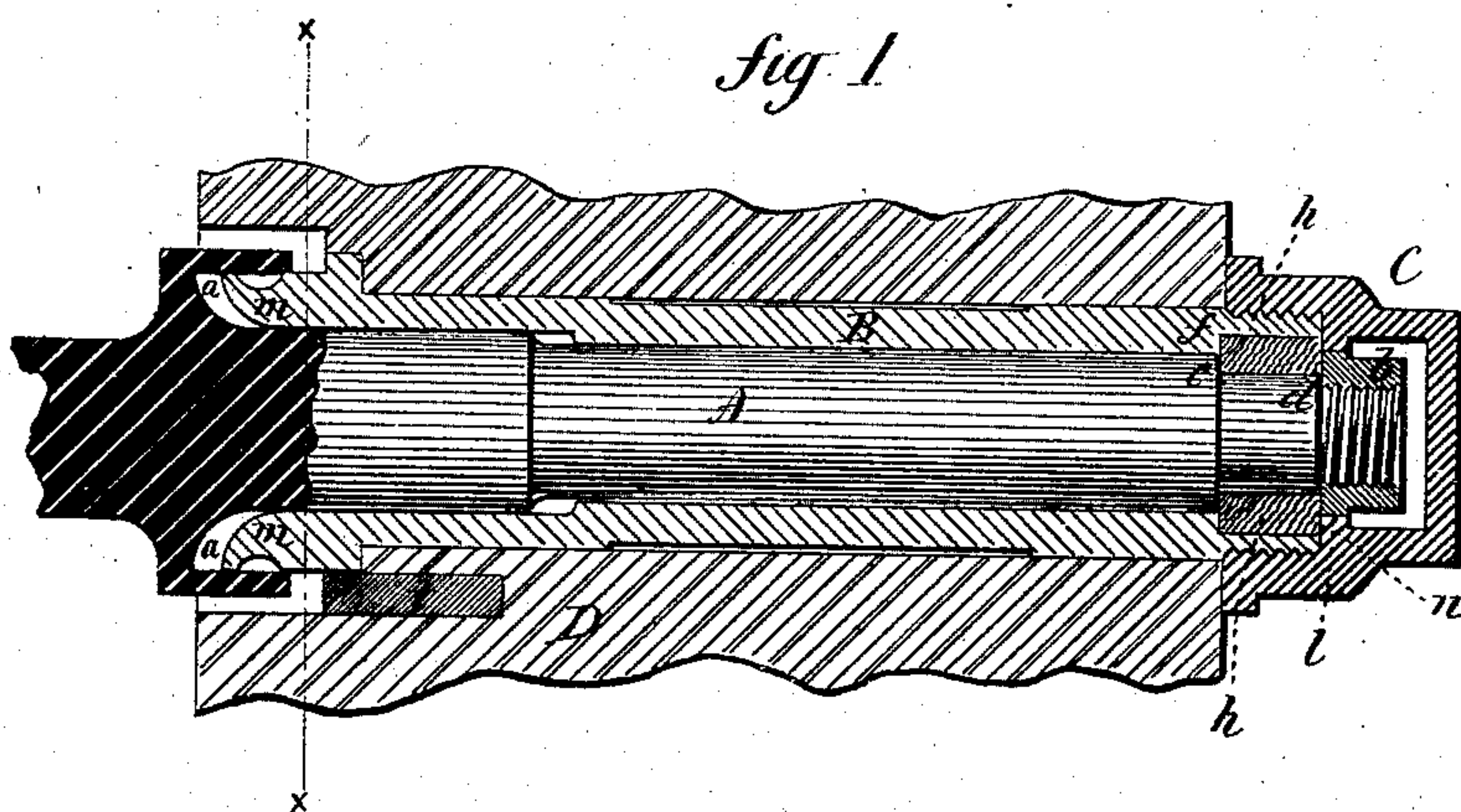
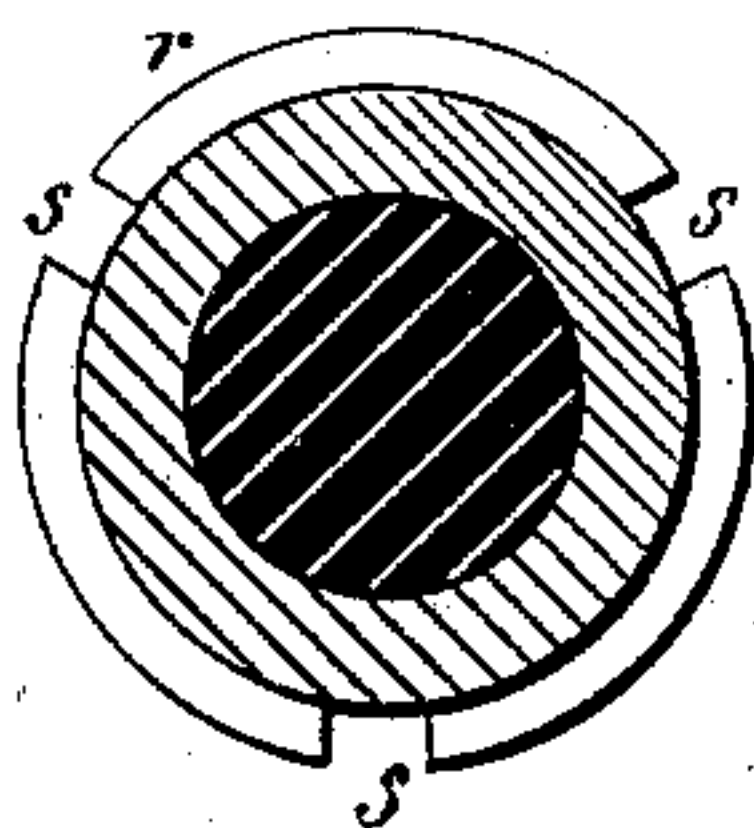


fig. 2



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CARRIAGE-AXLE.

SPECIFICATION forming part of Letters Patent No. 241,376, dated May 10, 1881.

Application filed March 21, 1881. (No model.)

To all whom it may concern:

Be it known that I, HENRY KILLAM, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Carriage-Axles; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a longitudinal central section; Fig. 2, a transverse section on line *x x*.

This invention relates to an improvement in carriage-axles, with special reference to axles for coaches and the larger class of carriages, but applicable as well to the lighter class of carriages, the object being principally to strengthen the axle at the shoulder—that is, so as to avoid the usual sharp angle, that angle being the point where the axle most readily breaks; and it consists in the construction as hereinafter described, and particularly recited in the claims.

A represents the axle-arm, of the usual general outline, save at the shoulder or collar the surface of the axle runs into the collar in the shape of a curve, as at *a*, so that the angle is filled and consequently strengthened. At the outer end the axle is provided with the usual nut, *b*.

Immediately in rear of the shoulder *d*, against which the nut *b* bears, the axle is reduced for a short distance, and so as to form a second shoulder, *e*, as seen in Fig. 1.

B is the box, fitted to the axle in the usual manner. At the front end the box is recessed a distance equal to the distance between the shoulders *d* and *e* on the axle-arm, and so as to form a shoulder, *f*, within the box corresponding to the shoulder *e*. This leaves a recess between the box and the axle-arm from the outer end inward to the shoulders *e f*.

After the box has been placed upon the axle-arm I introduce into this space a ring, *h*, whole or in parts, the size of the ring corresponding to the size of the recess between the axle-arm and box, and so as to strike the shoulder *e* on the axle, and so that the nut *b* on the outside will bear against the outside of the ring *h*, the nut or collar of the nut *b* being of less diame-

ter than the external diameter of the ring, so that a portion of the ring will be exposed outside the periphery of the collar *l* on the nut *b*.

The end of the box B is threaded upon the outside, and onto this threaded portion a cap-nut, C, is placed, covering the nut *b*, and so as to bear against the ring *h* outside the nut *b*, as shown in Fig. 1. Thus the thrust between the axle and the box is taken by the shoulders *e* and *f* upon the inside, and by the two nuts upon the outside—that is to say, the ring *h* being firmly held between the shoulder *e* on the axle-arm and its nut *b*, the shoulder *f* on the box takes the out-thrust, and the nut C takes the inward thrust against the ring *h*—so that there is no contact between the box and the shoulder at the inner end of the axle-arm, the box at that end being curved, as at *m*, to permit the curvature of the axle-arm at its intersection with its collar and without coming in contact therewith.

In the patent granted to me August 12, 1879, No. 218,443, a similar construction of the outer end of the axle-arm box and two nuts is found; but instead of filling the space with a non-elastic material a spring was introduced which would yield to the outward or inward thrust. By this improvement I desire to avoid that yielding, and thereby form rigid thrust-bearings at the outer end of the axle-arm, and which enables me to strengthen the arm by the curved intersection at its collar end.

The ring *h* is best made from hard wood, the grain running substantially parallel with the axis of the axle-arm, it being first thoroughly filled with oil; but it may be of any suitable non-elastic material, as rawhide, brass, Babbitt or other metal.

The usual method of preventing the box from turning in the hub has been to form longitudinal ribs or projections on the surface of the box to embed into the wood of the hub. As a better method of securing the box, I construct it with a collar, *r*, at its rear end, which enters the hub D, and in this collar, at one or more points, I cut a notch, *s*, (see Fig. 2,) then through these notches I drive a metal key, *t*, (see Fig. 1,) which takes into the wood of the hub and fills the notch *s* in the collar, and thus forms a firm connection between the box and the hub.

I claim—

1. The combination of an axle-arm reduced

at its forward end to form a second shoulder, *e*, in rear of the nut-shoulder *d*, the box constructed with a recess at its forward end to form a shoulder, *f*, corresponding to the shoulder *e* on the axle-arm, a nut on the end of the axle, a second nut covering the axle-nut, and a non-elastic ring in the recess between the axle-box and the axle-arm, against which the axle-arm box and both the nuts take a bearing, substantially as described.

2. An axle-arm constructed with a curved intersection with its collar at the inner end, and with a second shoulder, *e*, in rear of the nut-shoulder *d*, at the outer end, combined with a box recessed at its outer end, to form a shoulder, *f*, corresponding to the shoulder *e* on the

axle-arm, a non-elastic ring in the recess between the box and axle-arm at the outer end, and a nut on the axle-arm, a second nut on the box, both of said nuts taking a bearing on the said non-elastic ring, substantially as described.

3. An axle-box constructed with a collar, *r*, at its inner end, with one or more notches, *s*, therein, combined with a key, *t*, driven through said notch or notches into the wood hub, substantially as described.

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Witnesses:

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