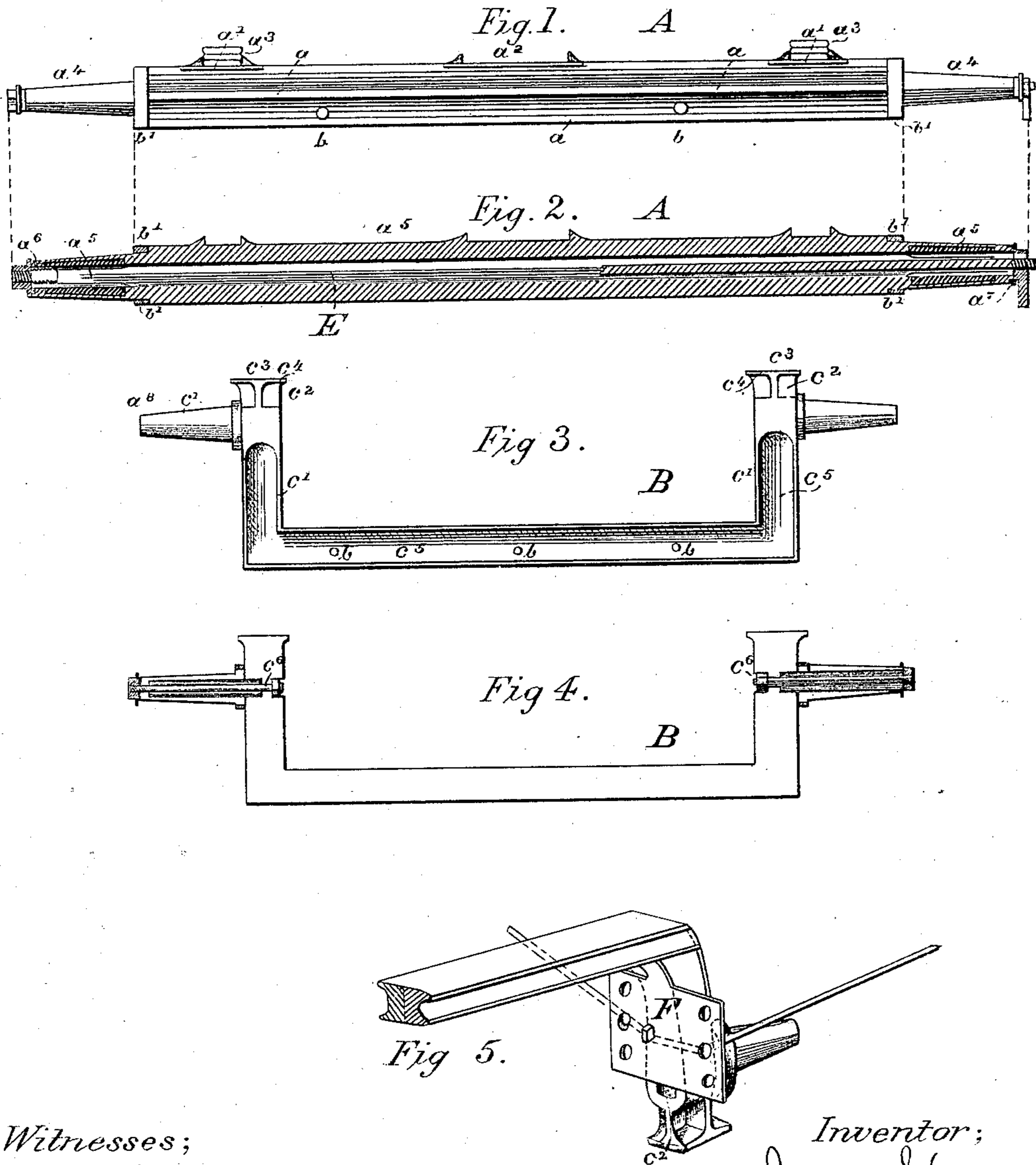


J. SKEEN.
Wagon-Axles.

No. 157,768.

Patented Dec. 15, 1874.



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Fig. 6.

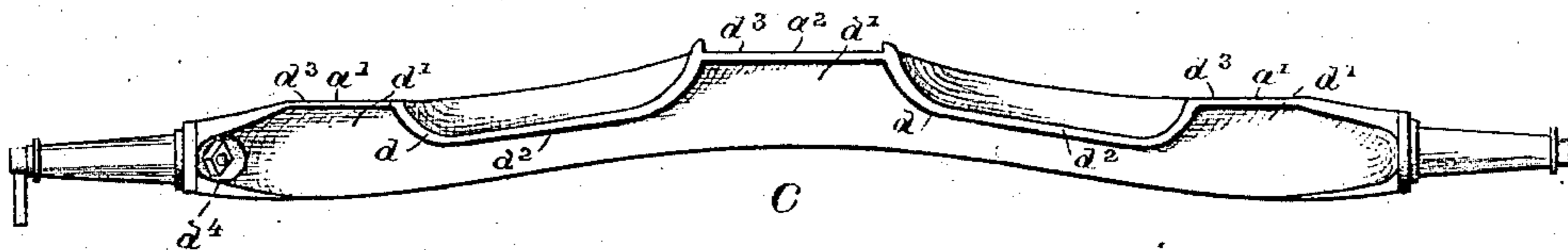


Fig. 7. D

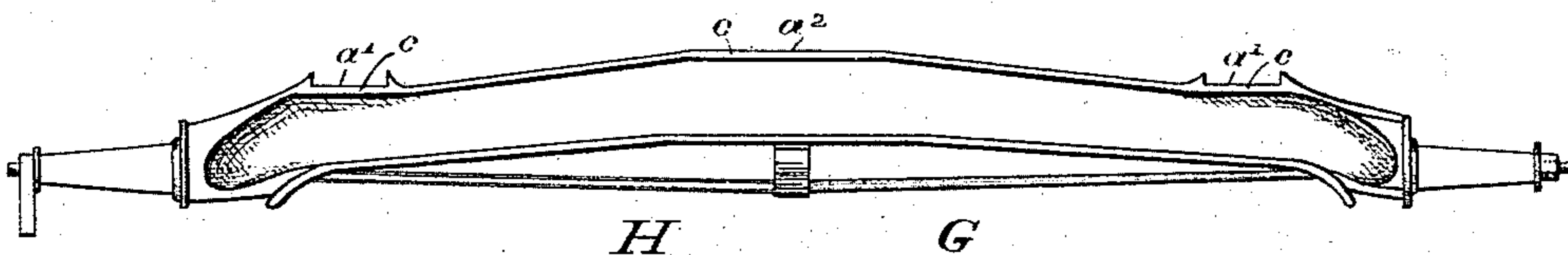


Fig. 8.

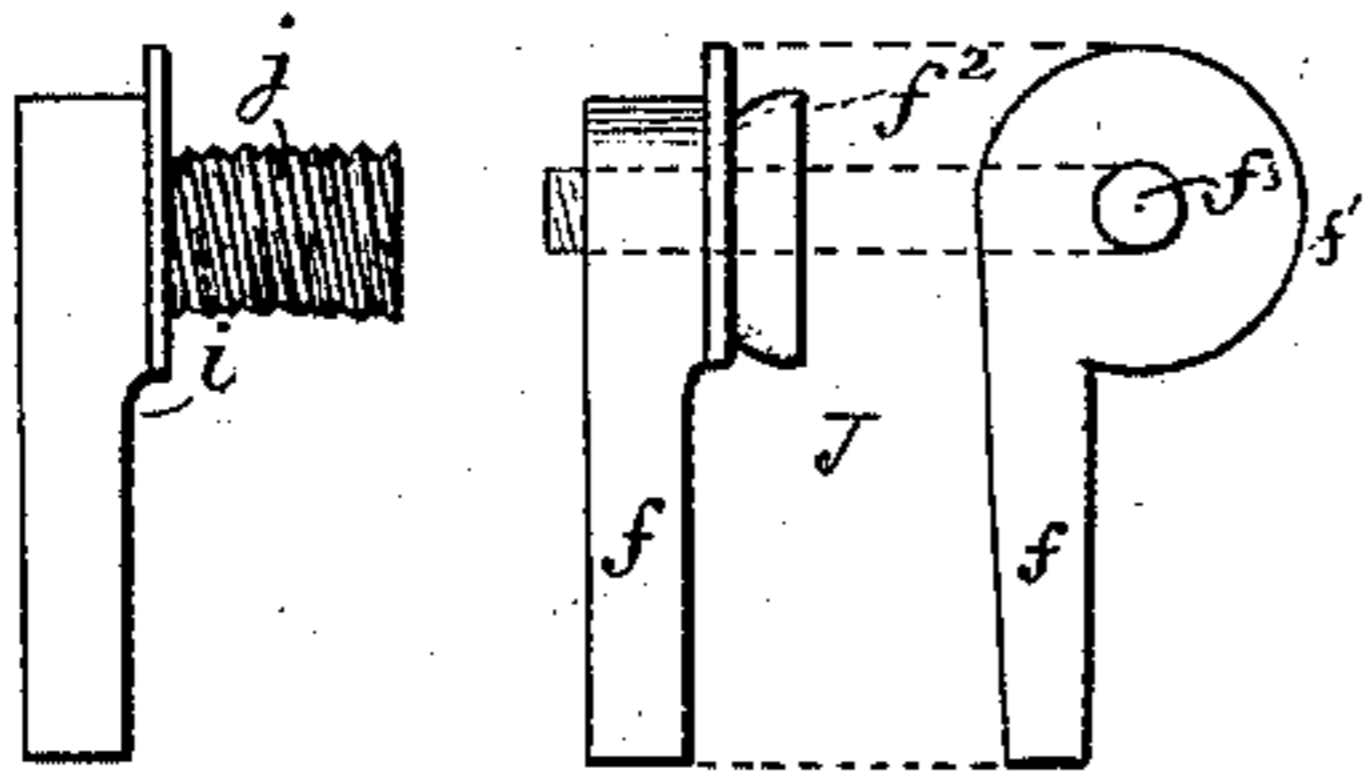


Fig. 9. L

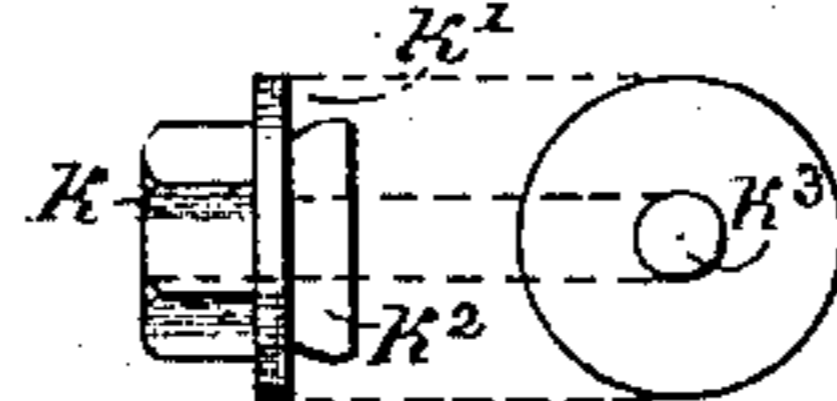


Fig. 10.

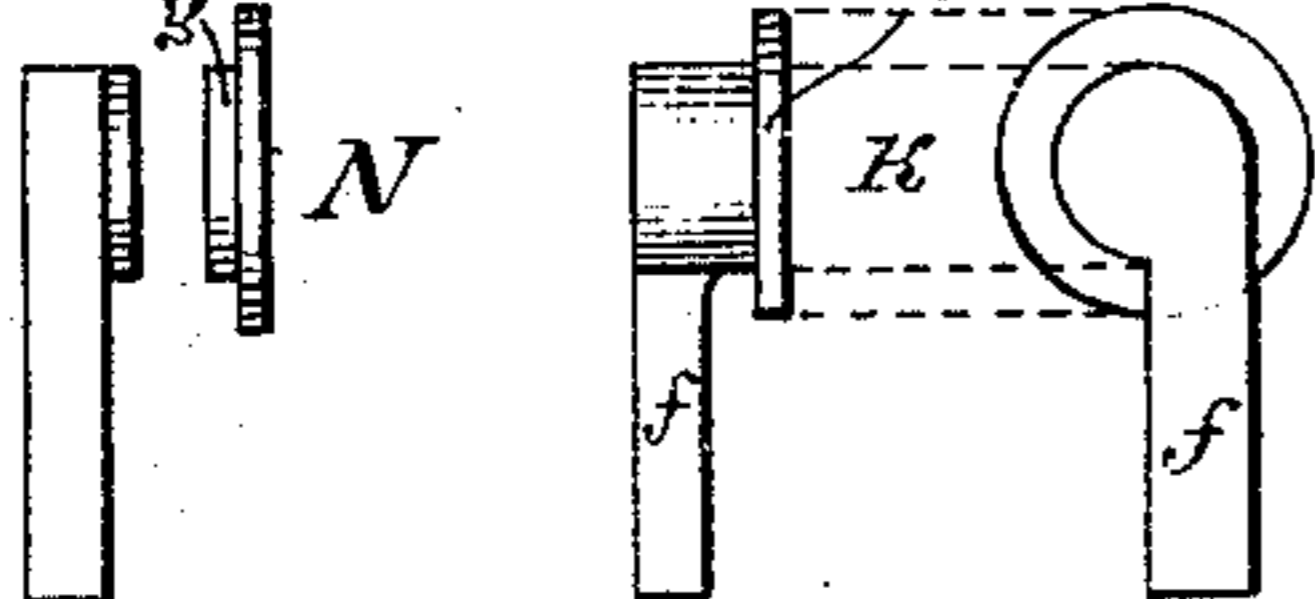
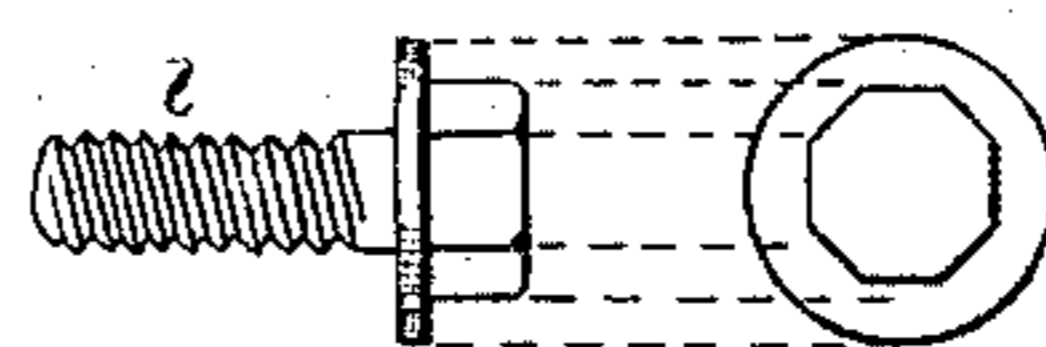


Fig. 11. M



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UNITED STATES PATENT OFFICE.

JACOB SKEEN, OF ALLEGHENY, PENNSYLVANIA.

IMPROVEMENT IN WAGON-AXLES.

Specification forming part of Letters Patent No. **157,768**, dated December 15, 1874; application filed February 12, 1874.

To all whom it may concern:

Be it known that I, JACOB SKEEN, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Wagon-Axles and their attachments; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The object I have in view is the construction of a wagon or carriage axle of cast metal, preferably of malleable iron, steel, or what is now known as converted steel, which, with its attachments and connections, shall be cheap, strong, durable, and convenient in use; and my invention therein consists in having said axles wholly or partially hollow, the same being either cored in the casting when the axles are cast in one piece, or the recess made by dies or formers when the axles are cast in two or more pieces; and in providing such axles with proper means of securing thereto springs or the frame-work of a wagon or other carriage; and in certain novel holding-nuts adapted for use in said axles; and, finally, in the various combinations of the several operative parts.

In order to enable those skilled in the art to make and use my improvements, I now proceed to describe the same in connection with the drawings, in which—

Figure 1 is a side elevation of one of my axles; Fig. 2, a vertical longitudinal central section of the same; Fig. 3, a side elevation of another form of axle; Fig. 4, a vertical longitudinal central section of the same; Fig. 5, an elevation, partly in perspective, of one end of the same axle; Figs. 6 and 7, side elevations of other forms of axles; and Figs. 8, 9, 10, and 11, separate views of various forms of holding-nuts.

Like letters designate corresponding parts in each figure.

A, B, C, and D represent the different forms of axles, all of which are of cast metal, and are wholly or in part hollow. The axle A is in cross-section, of the general form of a cross, having wings a radiating from the common center, and having, upon the upper wing or top, broad and flat portions a^1 , near the ends;

and a^2 in the center for the reception of springs a^3 , which are secured thereto by proper rivets or bolts, or by the use of covering-plates, as described in another application for Letters Patent by me of this date. This axle is cast with spindles a^4 , and both axles and spindles are hollow throughout, as shown by a^5 . When the axle is cast in one piece this hollow is made by a core in casting, but when the axles are cast in two or more pieces its hollow is made directly by the pattern, and each hollow is finished and made true conveniently by dies or formers. This hollow is, preferably, of uniform size throughout the body of the axle, but in the middle portion of the spindles it is usually made longer, for the purpose of taking less metal, and to better prevent the spindles from heating when in use. The extreme outer ends of the spindles are finished in different ways: One with an internal screw-thread, as at a^6 , for the reception of the holding-nut, as shown in Fig. 11, the other cut away a little, as shown at a^7 , for the reception of other forms of holding-nuts, as shown in Fig. 8, and yet another form, as shown by a^8 , which is not threaded or cut away, and adapted for use with the holding-nut shown in Fig. 10.

When this axle is cast in two parts these parts may be held together by suitable rivets or bolts b through the lower wings, also by the bolts or rivets which secure the springs to the axle; also by suitable bands b' , which may be sprung on over the ends of the axle, and by the holding-nuts which encircle and embrace the cut-away portions of the extreme ends of the spindles.

Through the hollow of the axles just described a bar or rod, E, is intended to pass, preferably of wrought metal, with each end e protruding from the outer ends of the spindles, where it is threaded to receive the holding-nuts.

The axle, however, may be used for some purposes to advantage without any bar or rod in any part of the hollow, or the hollow in the body of the axle may be filled with suitable wood, in which cases the spindles are threaded internally at their outer ends to receive the holding-nut shown in Fig. 11; and in instances where the axles, cast in two parts, are used,

the spindles only may have metallic bolts or bars in their hollows, and the hollow of the body of the axle be left unfilled, or the same may be filled with suitable wood, all of which can be readily done before the two parts of the axle are clamped together, as described.

The axle B is intended mainly for use either with its curve downward, as shown in Figs. 3 and 4, for a dumping wagon, or its curve upward, as shown in Fig. 5, for a lumber-wagon. This axle may be of the general form of a T-rail, as shown in central section, and it has a body, *c*, nearly straight, and arms *c*¹, springing nearly at right angles from the body, from the upper parts of which the spindles extend. The arms *c*¹ extend above the spindles, and are recessed, as at *c*², so as to leave a plate, *c*³, with flanges *c*⁴, by means of which to secure, by proper bolts, the proper frame-work of the wagon.

When this axle is reversed, as shown in Fig. 5, it may have secured to or cast upon the inner side of its arms a plate, *F*, for the purpose of fastening it to the proper frame-work of a wagon, and in this use the recesses *c*² may be pierced, for the purpose of passing brace or truss rods through them.

It will be observed that this form of axle is recessed upon each side, as at *c*⁵, extending up the arms a distance nearly as far as the spindles. The spindles, however, are hollow, the opening extending through them, and through the arm *c*¹, in a direct line. This hollow may be recessed, as at *c*⁶, to receive the head of a proper bolt or bar, and the hollow in the middle portion of the spindle enlarged, in the manner and for the purposes before named.

The axle C, shown in Fig. 6, has side flanges *d*, extending upwardly in arches *d*¹ at the center and at the ends, and downwardly in arches, as at *d*². The surface of the upper parts of the arch *d*¹ form the seats *d*³ for the springs. In this form of axle the spindles are hollow, and may be used with a bolt, *d*⁴, as shown in Fig. 6, or without a bolt.

The axle D, shown in Fig. 7, is of the T form in central cross-section, and is arched upward a little centrally, having suitable seats *a*¹ for the reception of the springs. It is preferably fitted with a truss-rod, *G*, whose threaded ends pass out through the spindles, and whose center passes freely through a clip, *H*, secured to the lower part of the axle.

Several forms of locking-nuts, J K L M, are shown in Figs. 8, 9, 10, and 11. The locking-nut J, has a weighted lever-handle, *f*, a disk, *f*¹, from which the handle depends, a cup, *f*², adapted to fit closely over the cut-away ends of the spindles before described, and a central threaded opening, *f*³, through the center of the disk and the cup. Another form, K, differs from the preceding in having no cup, but instead is used with a washer, N, having a boss, *g*, against which a protruding part of the head of the handle presses in use. A modification of this, *h*, has no cup, and is

used without a washer, as before described. Another modification, *i*, instead of a cup, may have a threaded projection, *j*, to screw into the threaded interior of the spindle, before described. Another form, L, shown in Fig. 9, has a polygonal end, *k*, for convenient manipulation, a disk, *k*¹, a cup, *k*², to fit over the cut-away part of the spindle, and a threaded central opening, *k*³. A modification, M, has, instead of a cup, a threaded body, *l*, to engage with the corresponding threaded interior of the spindle.

It will be observed that the various forms of axles may be cast in one or more pieces, and when cast in one piece cored in whole or in part in casting, and when cast in more than one piece with the hollows turned and finished up by dies or formers. Also, in making of my axles, I true the spindles by dies or forms, and avoid disturbing the skin of the metal by turning or grinding.

The advantages claimed for my improvements are, the very great cheapness and durability of the axles, on account of their being cast; their great strength and lightness, by reason of being hollow, and by reason of their peculiar shape in cross-section; and the great convenience of the seats for the springs, which dispense with the expense of clips, and are equally strong, or stronger. The advantages of my spindles are the same, with the additional one of avoiding heating in use, by reason of their hollow interior, and of getting increased size, and therefore a better and stronger bearing; and in connection with these axles and spindles the saving in expense and the great increase in convenience by dispensing altogether with skeins; and, in the same connection, the great increase in strength by the use of wrought-metal rods passing through the axles and their spindles. My locking-keys, also, it will be perceived, are adapted only to such axles and spindles, and in use therewith are convenient and cheap.

Having thus described my improvements and some of their advantages, what I claim as new therein, and my invention, is—

1. A cast-metal axle with seats upon its upper surface, adapted to receive springs and fasten them to said axle with bolts, substantially as described and shown.

2. In combination with a cast-metal axle and hollow spindles, a locking-nut with a weighted handle, substantially as described and shown.

3. A cast-metal axle with the body extending above or below the spindles, the body and spindles cast in one piece, the spindles being hollowed out, in combination with bolts within the hollow of the spindles, substantially as described and shown.

This specification signed and witnessed this 3d day of February, 1874.

JACOB SKEEN.

Witnesses:

R. N. DYER,

CHAS. THURMAN.