

(No Model.)

N. S. KETCHUM.

WAGON AXLE.

No. 397,131.

Patented Feb. 5, 1889.

Fig 1.

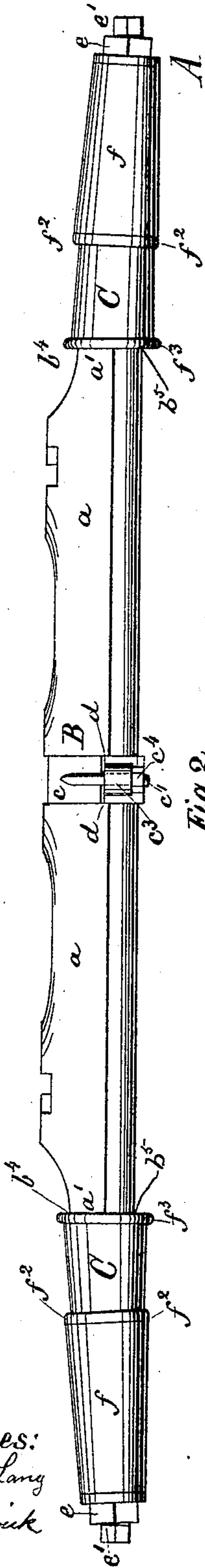


Fig 2.

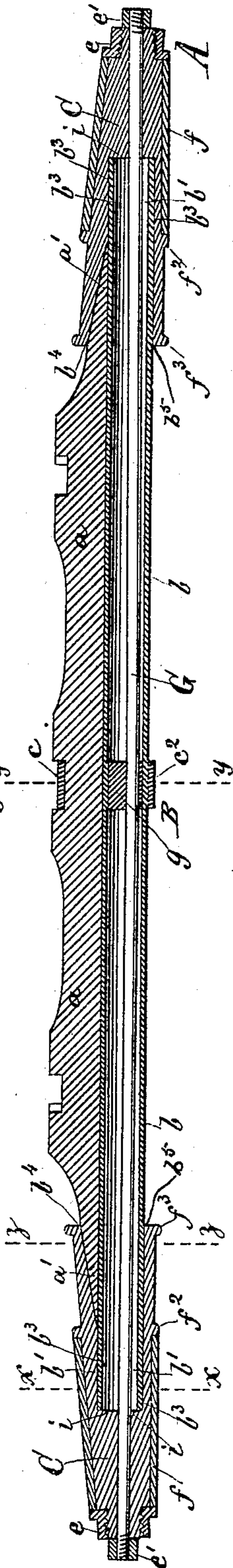


Fig 3.

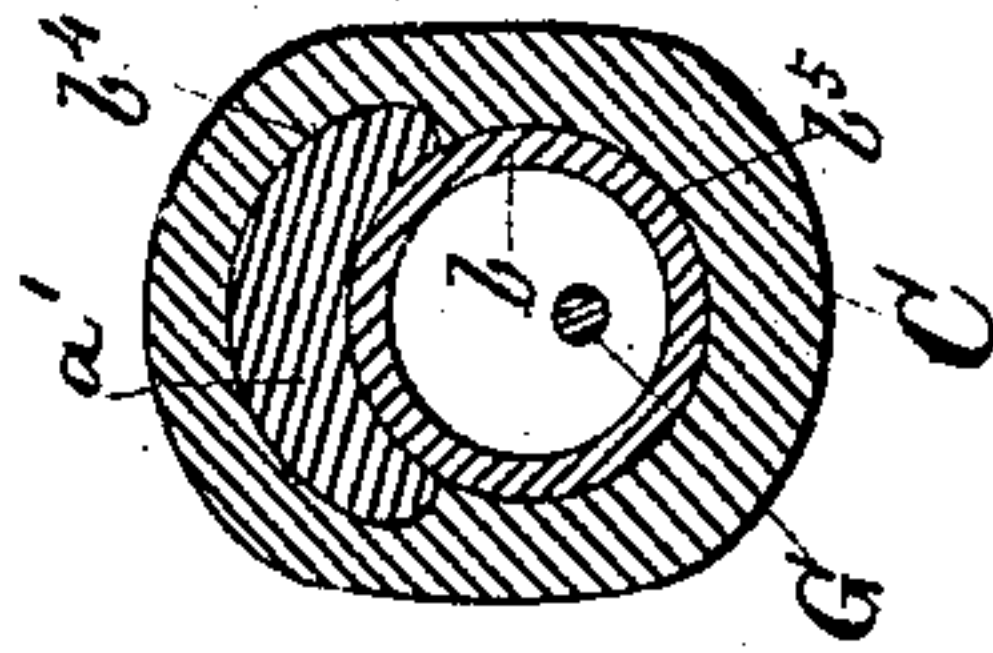


Fig 4.

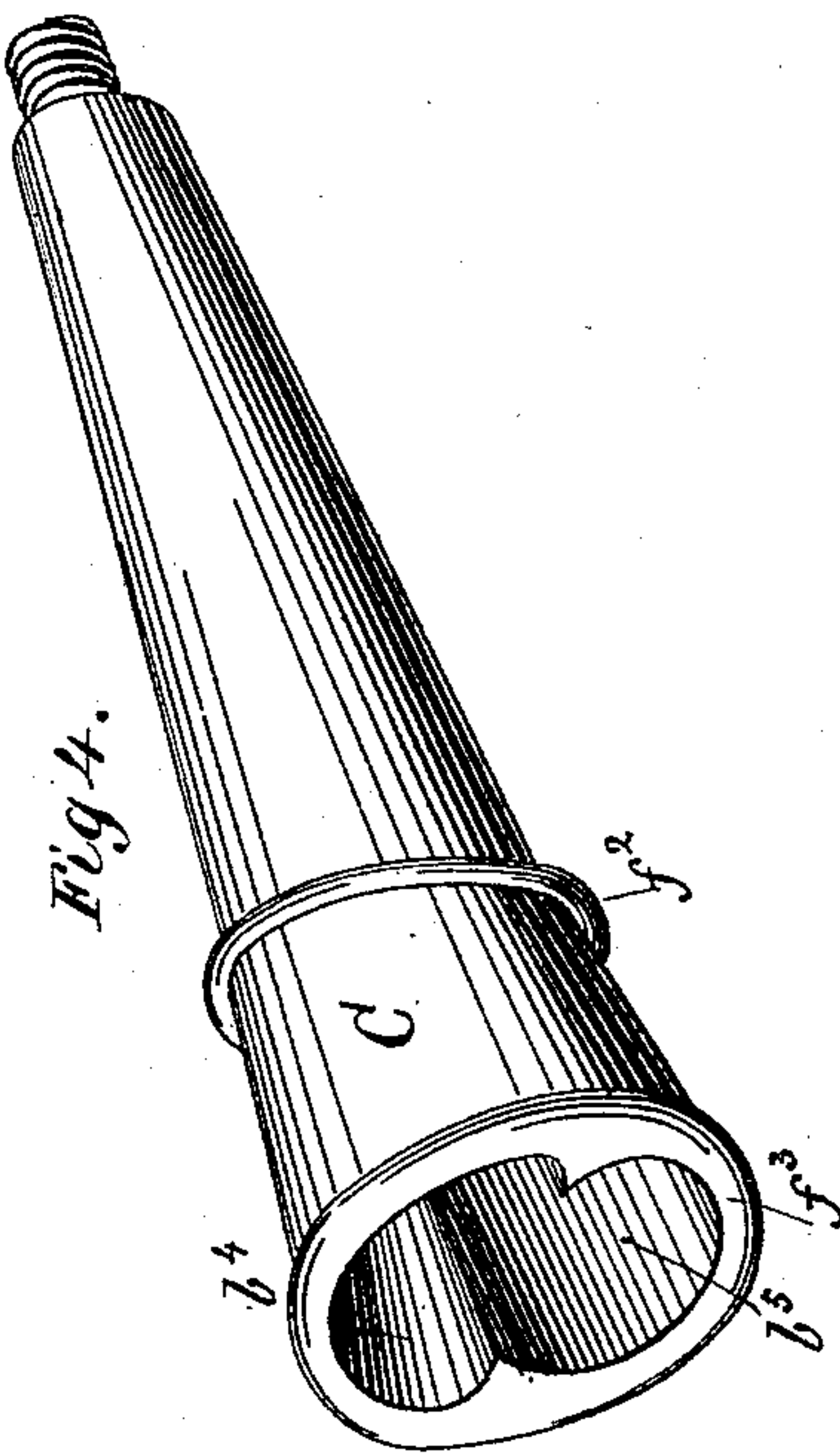
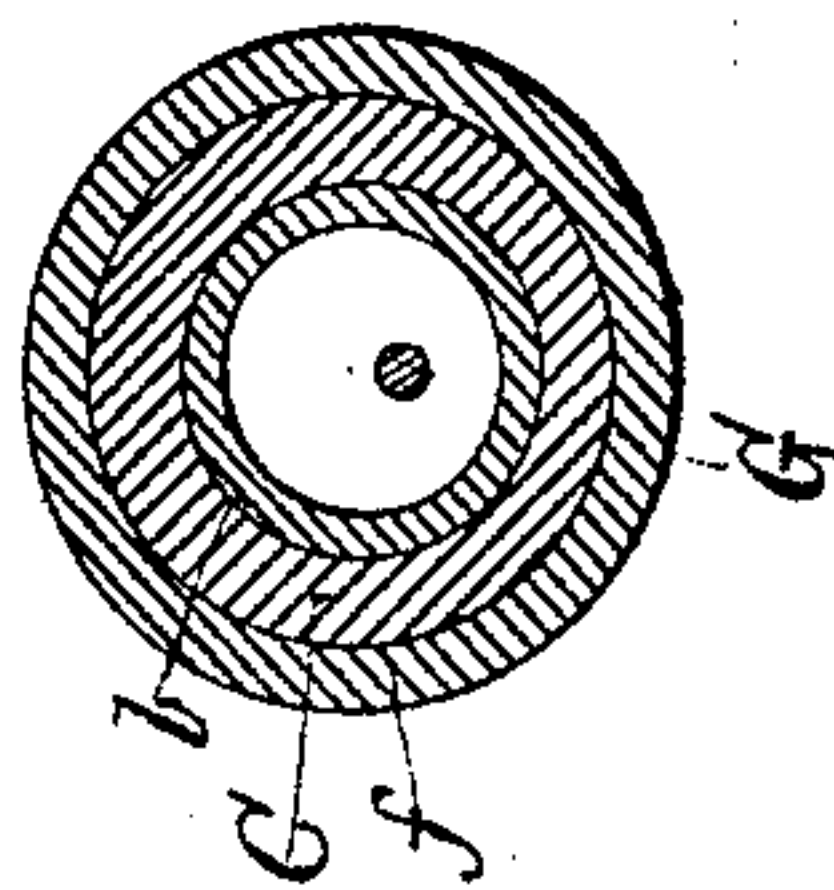


Fig 5.



Witnesses:  
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Inventor:  
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by his attys  
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# UNITED STATES PATENT OFFICE.

NATHANIEL S. KETCHUM, OF MARSHALLTOWN, IOWA.

## WAGON-AXLE.

SPECIFICATION forming part of Letters Patent No. 397,131, dated February 5, 1889.

Application filed November 3, 1887. Serial No. 254,139. (No model.)

*To all whom it may concern:*

Be it known that I, NATHANIEL S. KETCHUM, a citizen of the United States, residing at Marshalltown, in the county of Marshall and State of Iowa, have invented certain new and useful Improvements in Wagon-Axles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In the accompanying drawings, illustrating my invention, Figure 1 is a side elevation of my improved wagon-axle; Fig. 2, a vertical central longitudinal section of the same; Fig. 3, a vertical transverse section in the line  $x$  of Fig. 2; Fig. 4, an enlarged perspective detached view of the axle-skeins; Fig. 5, a vertical transverse section in the line  $y$  of Fig. 2, and Fig. 6 a like section in the line  $z$  of Fig. 2.

The object of my invention is the construction of a wagon-axle which shall possess the qualities of lightness, durability, and very great strength, compared with wagon-axles as generally constructed and in common use for sustaining and transporting heavy loads; and it consists, in the main, in the utilization of a truss-rod secured longitudinally of the axle and within either an oval or a round tube, as the case may be, which, in connection with a truss-block within the tube, not only serves the purpose of holding and tightening the "skeins" upon the tapered wood stock of the axle, but also resists the downward pressure of a superincumbent load, as well as serving to hold securely in position the main parts of the wagon-axle, as will be hereinafter described; and it also consists in certain constructions and combinations of parts hereinafter described and specifically claimed.

As shown in Figs. 1 and 2, the upper longitudinal portion of my improved axle A is composed of wood stock  $a$ , having tapering ends, as at  $a'$ , which terminate a short distance from the ends of the metal tube  $b$  when applied to said tube, as in Figs. 1 and 2, said wood stock  $a$  on its under side being formed with a half-circle groove or nearly a half-circle groove, as indicated at  $a^2$ , Fig. 5, which extends from end to end of the stock  $a$  to receive therein and form a seat for the metal

tube  $b$  when said stock and tube are held in juxtaposition, as indicated in Figs. 1, 2, and 5. The stock and tube central of their length are held together by an adjustable strap-box or confining device, B, the upper half of which is composed of a flat or plate-metal strap, as  $c$ , provided with screw-bolts, as  $c'$ , while the lower half is formed of a half-circle plate,  $c^2$ , to fit up against the tube  $b$ , as shown, and with bolt-eyes on either side, as at  $c^3$ , through which the screw-bolts  $c'$  pass and receive on their ends tightening screw-nuts  $c^4$ , as shown in Figs. 1 and 2. The drawings in Figs. 1 and 5 show the strap-box B "screwed up" upon the wood stock  $a$  and the tube  $b$ , but with an adjusting-space,  $d$ , left between its upper and lower portions, so that any shrinkage of the wood stock may be compensated for by still further screwing up the nuts  $c^4$ , thereby tightening the wood stock and tube more firmly together.

The tube  $b$ , which in cross-section may be either oval or round, as desired, the same being shown in this instance round, may be of any suitable metal and of a length somewhat longer, as shown, than the wood stock  $a$  of the axle, into the under side of which it is seated, so that the projecting ends of the tube, as at  $b'$ , beyond the tapering ends  $a'$  of the wood stock may enter and exactly fit into circular chambers  $b^3$  of the axle-skeins C, while at the same time the tapering ends  $a'$  of the wood stock may enter, fit, and be confined in upper partially-oval chambers or hoods,  $b^4$ , of the axle-skeins C C.

The axle-skeins C, as before stated, are made with circular chambers  $b^3$ , to receive the ends of the metal tube  $b$ , and with partially-oval chambers or hoods  $b^4$ , to receive the tapered ends  $a'$  of the wood stock  $a$ . These skeins are of oval form in cross-section and taperingly constructed from end to end, as shown in Figs. 4 and 6, so as to give the required "gather" and "pitch" of the wheel used thereon, and at their outer ends are screw-threaded, as shown, to receive a screw-nut,  $e$ , whereby a thimble,  $f$ , may be held in place upon the skein. These axle-skeins are also perforated longitudinally through their outer ends, as indicated in Fig. 2, and through which perforations, as shown in said figure, a truss-rod, G, freely passes at either end, as shown, and



which at each end is screw-threaded to receive a tightening-nut,  $e'$ . This rod  $G$ , as clearly shown in Fig. 2, passes through the entire length of the wagon-axle and through a tube,  $b$ , and centrally of its length it passes through a solid circular metal truss-block,  $g$ , which snugly fits within the tube, the aperture through said block  $g$  being of just sufficient size or diameter to allow the rod  $G$  to pass through, such aperture being, as clearly shown in Fig. 5, below the horizontal axis of the truss-block  $g$ , so that from the block to either end of the axle outwardly to the screw-nuts  $e' e'$  the rod  $G$  occupies an ascending plane within the tube  $b$ , and thus when the rod is strained by screwing up the nuts  $e' e'$  there will be a lifting or upward strain or pulling or truss action upon the truss-block  $g$ , which will resist and help to sustain the downward pressure of a superincumbent load upon the axle; and, aside from such function of the truss-rod and block  $g$ , the screwing up of the nuts  $e' e'$  will force the skeins  $C, C$  to abut tight against the ends of the rod  $G$ , and also hug tightly over and upon the tapering ends  $a' a'$  of the wood stock  $a$ , and so firmly and securely hold the several parts in working position.

The thimble  $f$  at its inward end abuts against a shoulder,  $f^2$ , of the axle-skein  $C$ , while at its outer end the nut  $e$  confines the thimble in position upon the skein. The nut  $e$  is of such size that it may be unscrewed from the skein  $C$  without interfering with the tightening screw-nut  $e'$  upon the truss-rod  $G$ , and hence a wheel used upon my improved axle

may be removed without interfering with the truss-rod.

The skein  $C$ , which at its upper inner end is constructed with a partially-oval chamber or hood,  $b^4$ , which is made to fit upon the tapered end of the wood stock  $a$ , also has a semicircular channel,  $b^5$ , extending the distance between its shoulder  $f^2$  and its shoulder  $f^3$ , so that when the tube  $b$  is in position therein, as in Fig. 2, the tube will be partially inclosed by said channel and a tapering end,  $a'$ , of the wood stock  $a$ , as shown, while at the same time a like length of the tube at its outermost end will be inclosed completely by the metal skein inside of its circular chamber  $b^3$ , and so as to have the extreme end of the tube  $b$  abut against the skein at the point  $i$ , as clearly shown in said figure.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the abutments  $i$  of a wagon-axle skein, the wood stock  $a$ , metal axle-tube  $b$ , perforated metal truss-block  $g$  within the tube, truss-rod  $G$ , and tightening-nuts  $e'$ , substantially as and for the purpose described.

2. A wagon-skein,  $C$ , constructed at its inner end with a hood,  $b^4$ , a semicircular channel,  $b^5$ , and a circular chamber,  $b^3$ , substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

NATHANIEL S. KETCHUM.

Witnesses:

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FRED. P. MOFFATT.