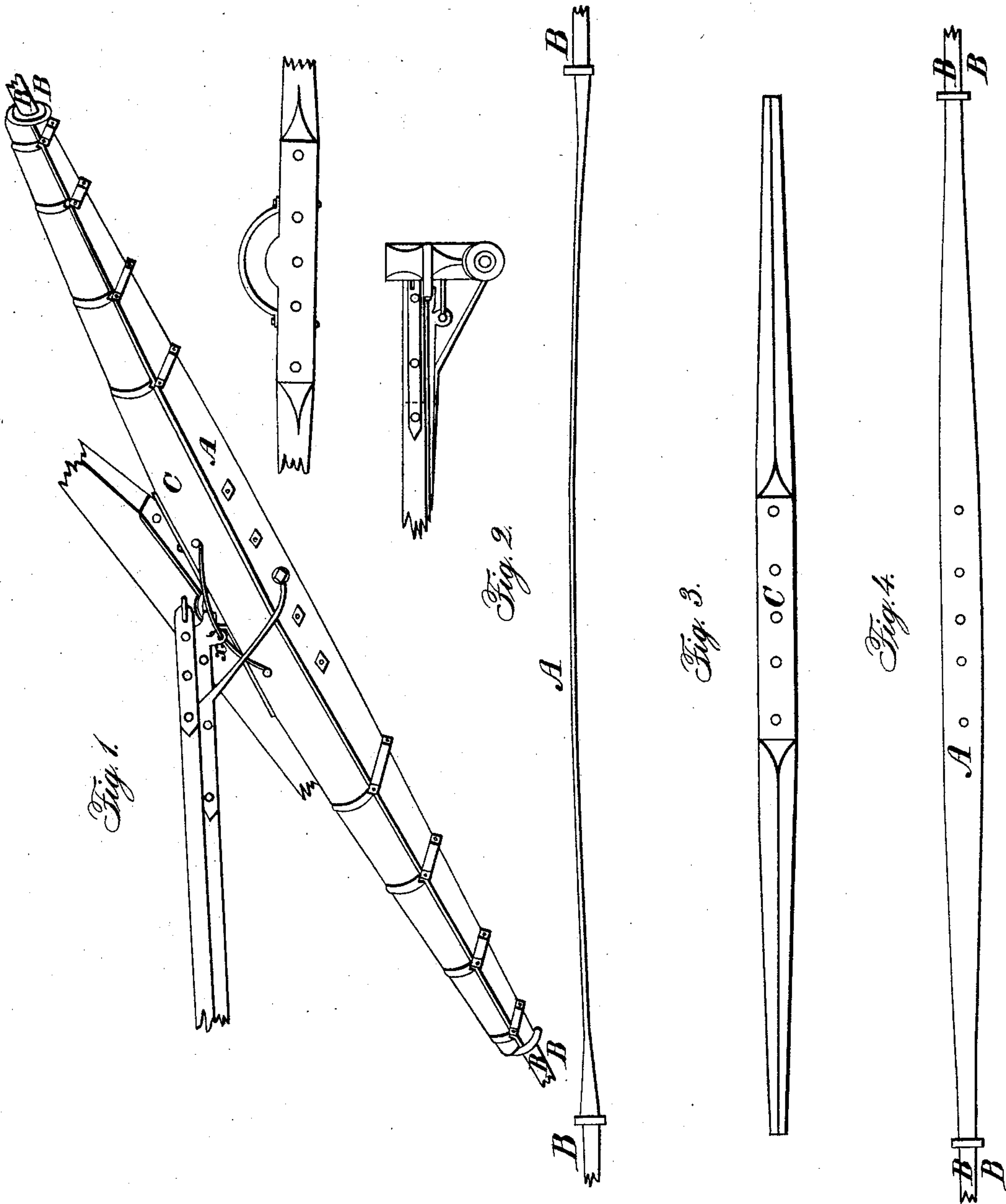


G. P. KIMBALL.

Axle.

No. 69,819.

Patented Oct. 15, 1867.



Witnesses:

Henry Haight  
James Shurley

Inventor:

George P. Kimball.

# United States Patent Office.

GEORGE P. KIMBALL, OF SAN FRANCISCO, CALIFORNIA.

*Letters Patent No. 69,819, dated October 15, 1867.*

## IMPROVEMENT IN AXLE-TREE FOR WAGONS.

The Schedule referred to in these Letters Patent and making part of the same.

### TO WHOM IT MAY CONCERN:

Be it known that I, GEORGE P. KIMBALL, of San Francisco, in the county of San Francisco, and State of California, have invented certain new and useful Improvements in Axle-Trees; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of an axle-tree constructed in accordance with my invention.

Figure 2 is an elevation of the same.

Figure 3 is a top view of the wooden axle-bed; and

Figure 4 is a like view of the steel axle-tree.

A represents the steel centre of the axle-tree. B B are the arms upon which the wheels are held. C is the bed or wooden part of the tree, which is flat at its base, and gradually decreases in width towards the top.

The axle-tree proper A is a flat metal plate, the centre part of which is steel, while the arms B are either steel or iron, as preferred. This plate is very thin compared with ordinary axle-trees, increasing, however, in thickness as it approaches the ends or arms B. Its width, on the contrary, lessens as it approaches the arms, being greatest at the centre, as shown in figs. 1 and 4. The wooden portion or axle-bed C is applied to the steel tree in the usual manner, the two being held together by bolts or other suitable means, as shown in the drawings, there being on top of the wooden bed a centre plate of metal, through which the bolts pass which hold this portion of the tree to the bed. In consequence of the great width of the steel tree at the centre the bolt-holes do not weaken the tree, as in the case with those made of iron. This extra width prevents the lateral bending, or, as it is termed, taking the set out of the axle-tree. The great strength of the steel compared with iron admits of the bar A being made very thin, so as to have less than half the weight of an ordinary axle-tree. At the same time the depth of the wooden part C is proportionately increased, the weight of the combined wooden and steel tree, however, being not more than half the weight of the common axle-tree and bed, while, at the same time, it possesses much more strength and durability, and is indued with a degree of elasticity which can never be attained in ordinary trees. It is not so liable to spring out or under as other trees, and will, under all circumstances, stand a heavier blow. The wagon body is supported upon the axle-bed C in any ordinary or suitable manner. To avoid danger of the wagon becoming disconnected from the trees, as sometimes happens through the breaking of bolts, I employ a safety-hook, which, although shown in the drawings, is not here described, as I contemplate making it the subject of a separate application for Letters Patent.

From the above-described construction of my improved axle-tree, it will be seen that the steel-centre tree forms, in fact, a spring-plate, which tapers in width, and increases in thickness, as it approaches what may be called its bearing points, *i. e.*, the arms B upon which the wheels turn. By combining with this spring-plate the wooden bed C, an axle-tree is obtained which, while possessing powers of resistance greatly superior to ordinary axle-trees, has an elasticity which other trees do not possess, and are not intended to possess. The great tensile strength and flexibility of the steel plate especially adapt it for the purpose for which it is used, while the wooden bed imparts to the whole the necessary firmness. This elasticity of the steel plate gives to the tree a certain springiness and liveliness of action which will carry the wagon in which such trees are used over all obstacles, such as are usually met with on roads, with scarcely a jar.

Having now described my invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

The combination, with a superposed wooden axle-bed, of the steel plate or spring axle-tree A, constructed and arranged for operation substantially as herein shown and for the purposes set forth.

GEORGE P. KIMBALL.

Witnesses:

JAMES SMILEY,  
HENRY HAIGHT.