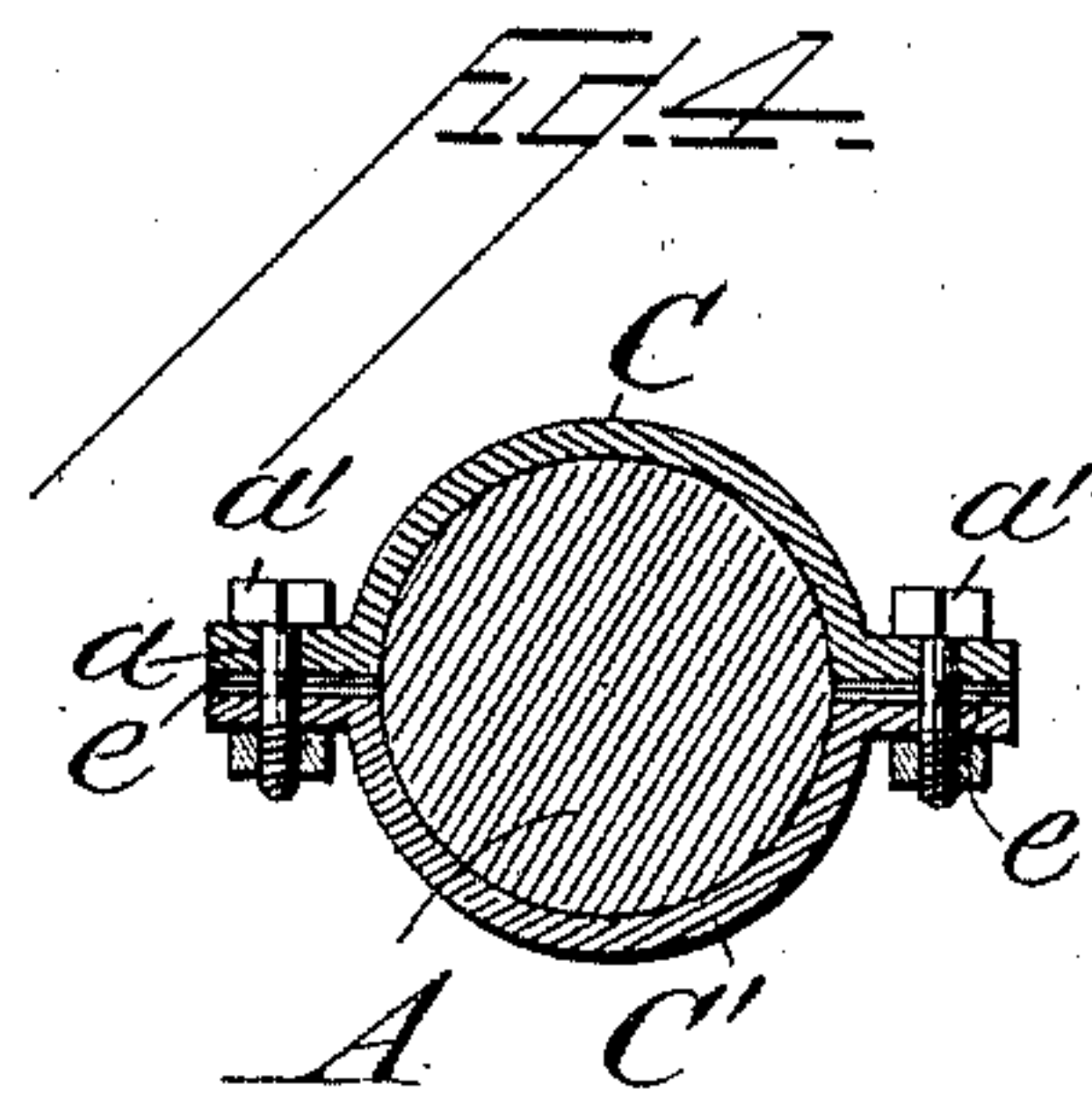
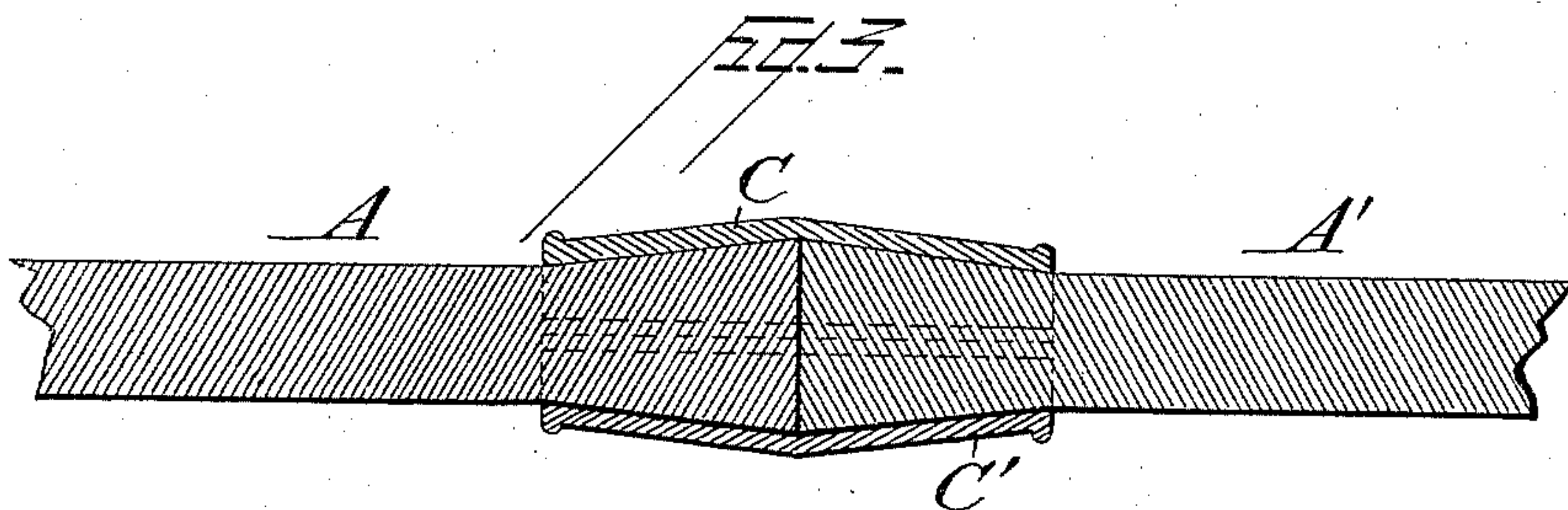
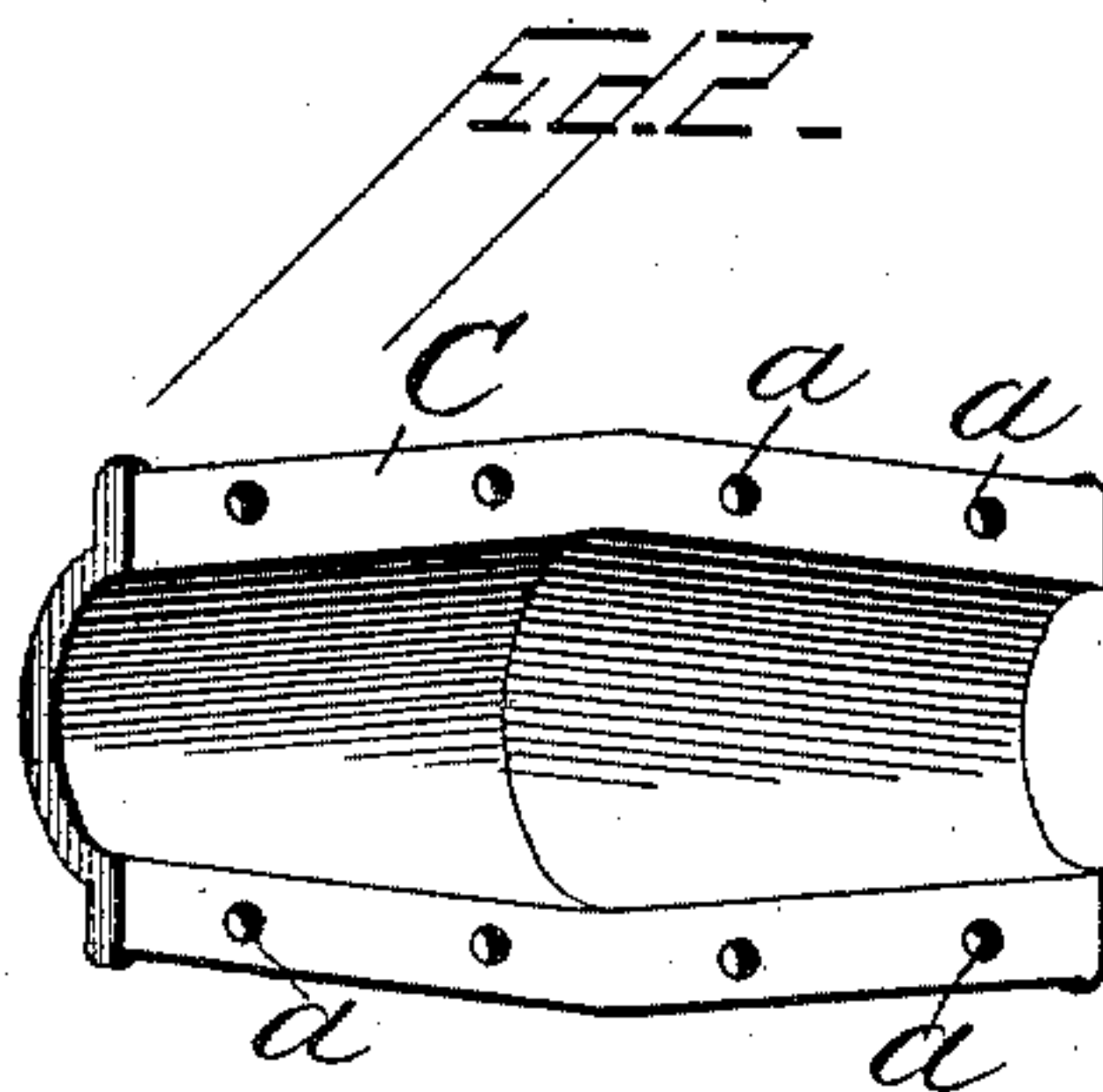
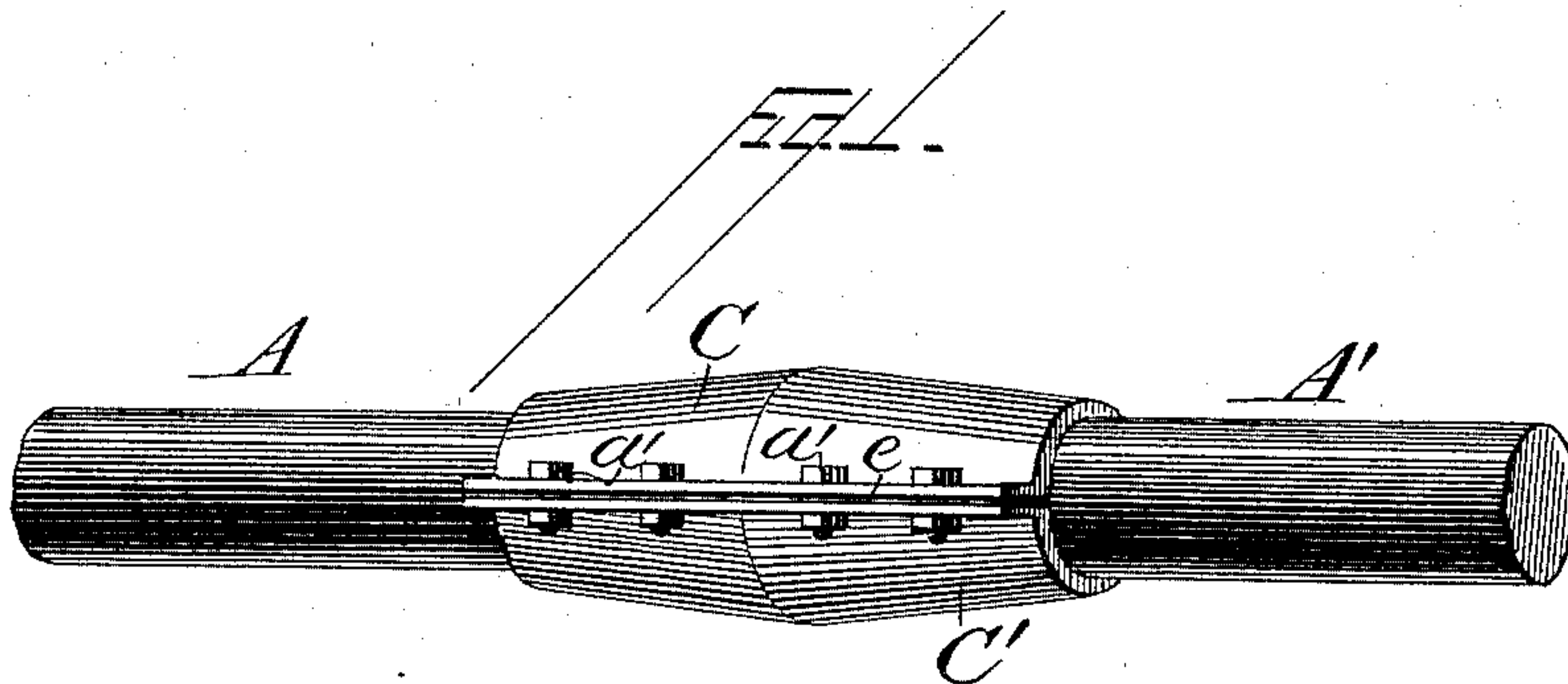


(No Model.)

S. L. DENNEY.
CAR AXLE.

No. 448,640.

Patented Mar. 24, 1891.



Attest:

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UNITED STATES PATENT OFFICE.

SAMUEL L. DENNEY, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO
HUGH KIRKWOOD, OF MINNEAPOLIS, MINNESOTA.

CAR-AXLE.

SPECIFICATION forming part of Letters Patent No. 448,640, dated March 24, 1891.

Application filed June 22, 1888. Renewed August 7, 1890. Serial No. 361,390. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL L. DENNEY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Car-Axles; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to certain improvements in that class of car-axles known as "divided axles," these axles being intended to allow a different rate of speed to the wheels attached thereto, so that it will not be necessary for either wheel to slip in passing curves, as the speed of each wheel adjusts itself automatically to the length of track over which it runs, thus avoiding the danger of derailment in passing curves and the great loss of power caused by the necessity of compelling one of the two wheels attached to each axle to slide, as it does when the axle is solid and the wheels firmly secured thereto, owing to the difference in length between the inner and outer rail on all railway curves.

One difficulty heretofore experienced in the construction of the sleeve or coupling which connects the two parts of a divided axle has been the cost of boring out these sleeves to fit the corresponding parts of the axle, which I overcome by casting the parts of the sleeve or coupling upon metallic cores of a form corresponding to that of the axle.

The object of my invention is therefore to so construct the parts of the axle and the coupling-sleeve by which these parts are united as to produce a cheap and practical device which may go into common use upon street-cars and the cars used upon railways having curves of a short radius, such as are now common in mountainous regions; and the invention consists, essentially, in enlarging the connected ends of the two parts of an axle and forming such enlarged part into a tapering frustum of a cone with its base at the end of each part, tapering as it extends toward the wheel until it becomes of the same

diameter as the body of the axle. Two flanged coupling-pieces are then applied to the axle covering the joint and conical parts. These coupling-pieces are brought together with thin layers of sheet metal interposed between the flanges, which are firmly bolted to each other by bolts passing through the flanges, all as will be hereinafter fully described.

In the accompanying drawings, which represent this invention and in which similar letters of reference indicate like parts in the different figures, Figure 1 is a perspective view of an axle embodying my invention. Fig. 2 is a perspective view of one of the coupling-pieces. Fig. 3 is a longitudinal section through the axle and coupling-pieces. Fig. 4 is a transverse section.

In the figures, A and A' represent the axle, B B the wheels, and C C' the coupling by which the two parts of the axle are united.

The parts A and A' of the axle are each enlarged at one end to form a frustum of a cone with its base at the point of junction, so that when the parts are brought together they will present the appearance of a double cone united at the base. In order to retain these two parts A and A' in position after the bases of the cones are brought together, I place over each part of the axle extending the whole length of the cones the two flanged pieces of the coupling C and C'. Each of these pieces fits the conical surfaces of the ends of the axle and is provided with registering holes *a a*, bored through the flanges *c*, said flanges extending from end to end of the coupling-pieces, and through these holes bolts *a' a'* pass that secure said parts C C' firmly together.

In constructing these coupling-pieces C and C', which are preferably of cast metal, I provide a pattern of the same to be molded in the ordinary way, and also a metallic core having the same contour as the outer surface of that part of the axle which the coupling-pieces are designed to cover. This core is placed in the mold, and when the metal is poured in forms the inner concave or wearing surface of the piece, which will be found to fit the axle perfectly without further boring or finishing, thus avoiding the expensive process of boring and otherwise preparing the inner surfaces of the sleeves to make

them fit the surfaces of the axle with which they come in contact. It will be observed that each of the pieces composing this coupling-sleeve covers a little less than half the circumference of the axle, so that when they are placed in position thereon a space will be left on each side between the flanges. This space is filled with strips of sheet metal *e*, which, as the axle and coupling wear, may be removed a piece at a time, thus keeping the parts always in their proper relation to each other, the whole forming a cheaply-constructed divided axle suitable for use upon street-cars or the more heavily-constructed cars employed in the transportation of freight and passengers on railway-lines. It will also be apparent that this sleeve may be applied to divided axles in cases where but one of the parts of said axle is provided with the conical wearing-surface embraced by said sleeve. I am aware that a divided axle having one of its parts provided with an enlarged or conical end is not new, neither is it new to divide longitudinally a sleeve used for coupling together the two parts of such an axle, and do not therefore claim such devices, but limit my claims to the axle as shown and described, in which the adjoining ends of both parts are conically-divided sleeve coned to fit said parts.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent, the following:

1. As an improvement in car-axles, an axle divided near its mid-length, each end of the adjoining parts enlarged to form the frustum of two cones with their bases contiguous to each other, in combination with a sleeve-coupling having its parts formed to fit the cones of the axle, the flanges of said coupling being in axial line with the axle and bolted together to retain the two parts of the axle in their proper relative positions, substantially as shown and described.

2. In a car-axle, the two conically-ended parts *A* and *A'*, in combination with the flanged coupling-sleeve composed of the parts *C C'*, the bolts *a' a'* for securing the parts of said coupling together, and the metallic strips *e e*, interposed between the flanges, all arranged to allow each part of the axle to rotate independently of the other part and compensate for wear, substantially as and for the purpose set forth.

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

SAMUEL L. DENNEY.

Witnesses:

THOMAS D. TODD,

FRANCIS H. NICHOLS.