

No. 633,116.

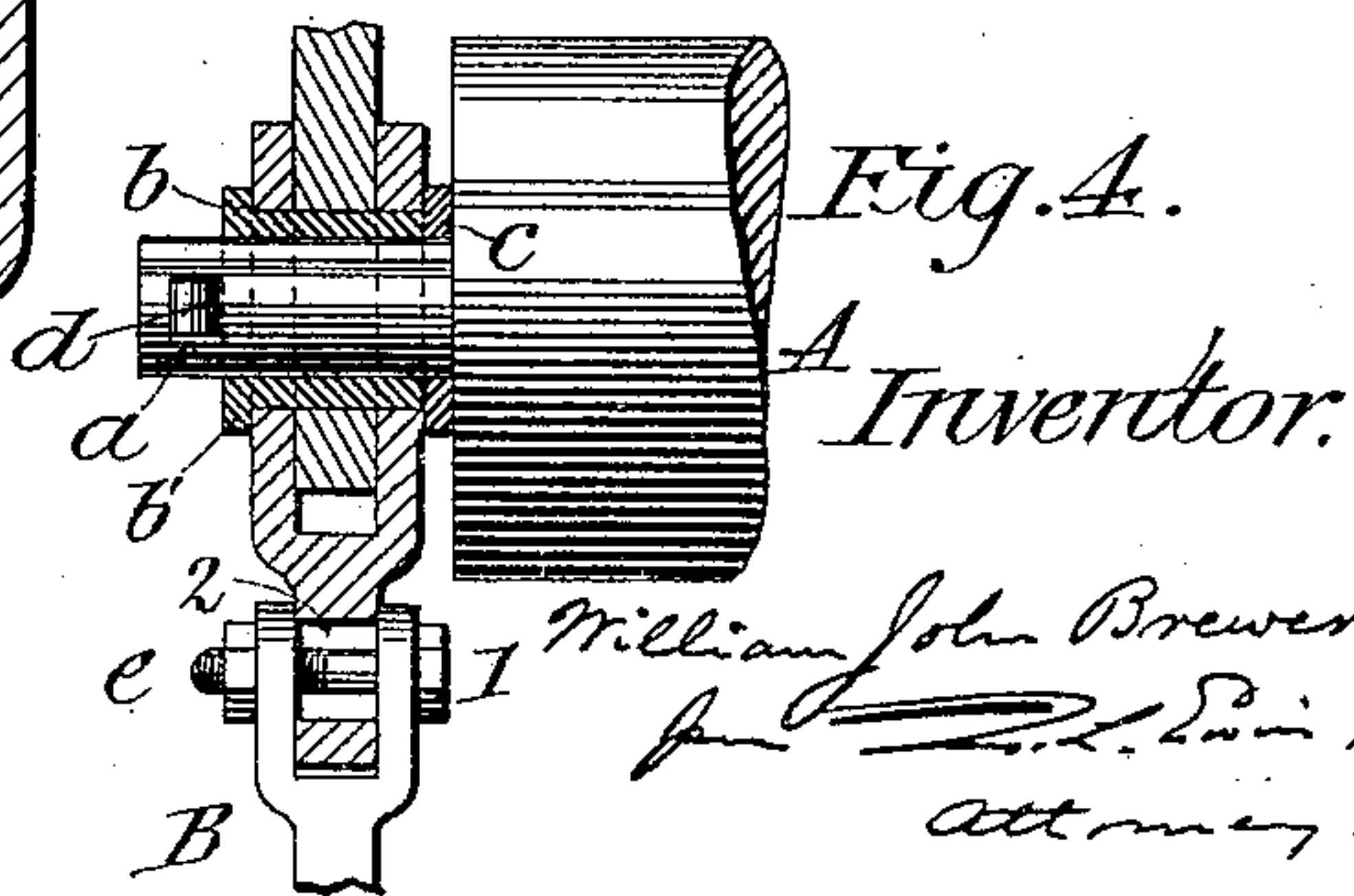
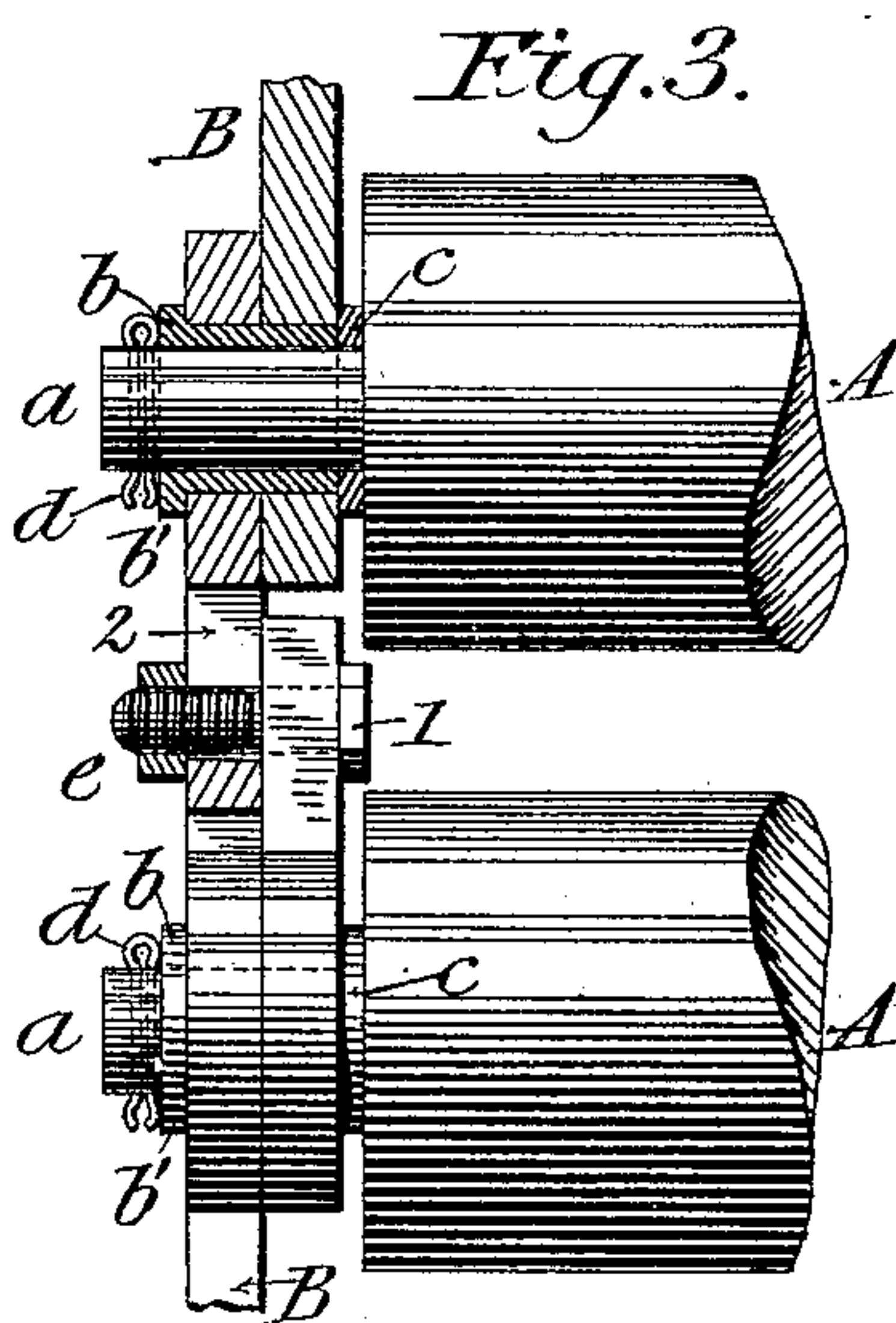
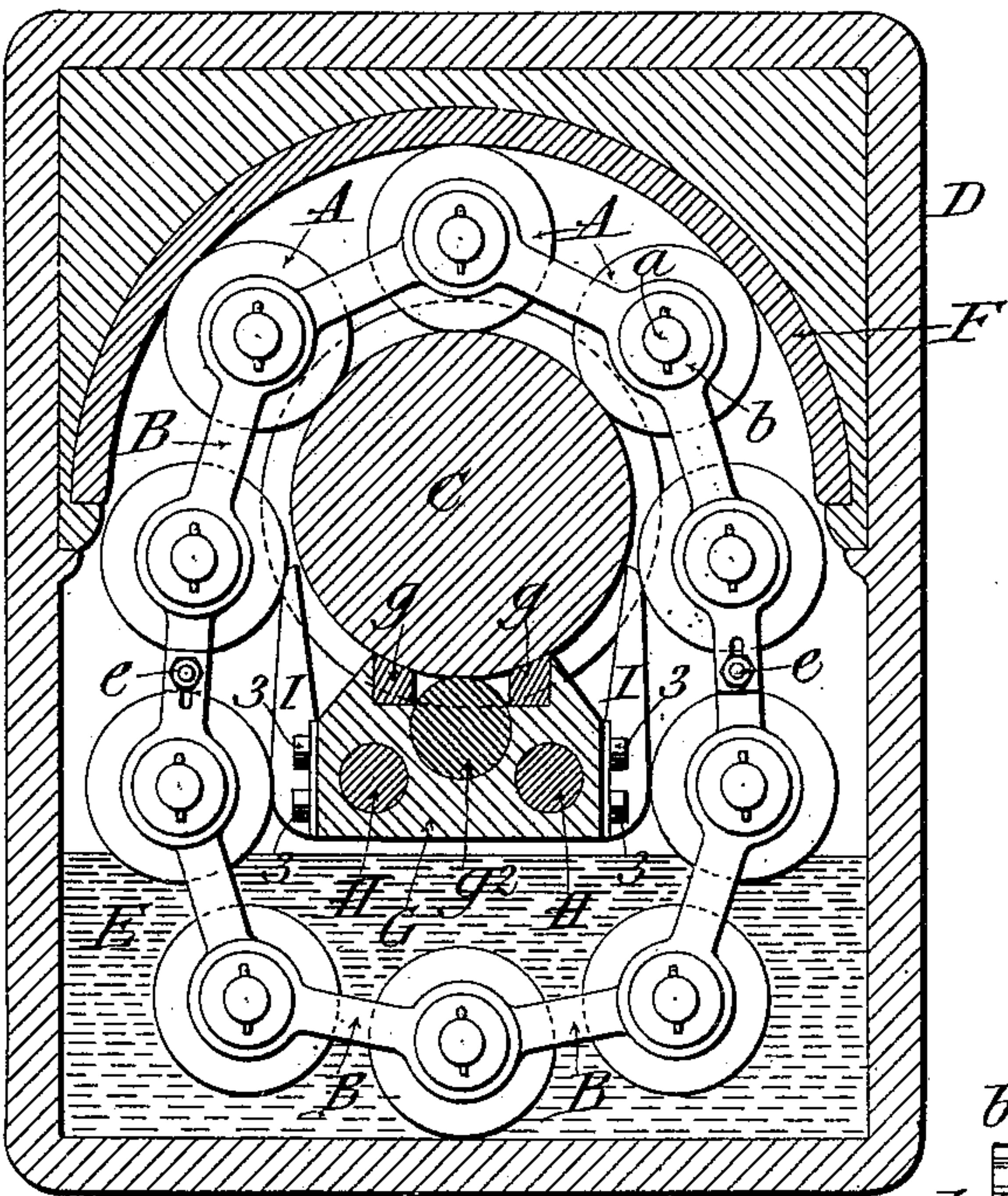
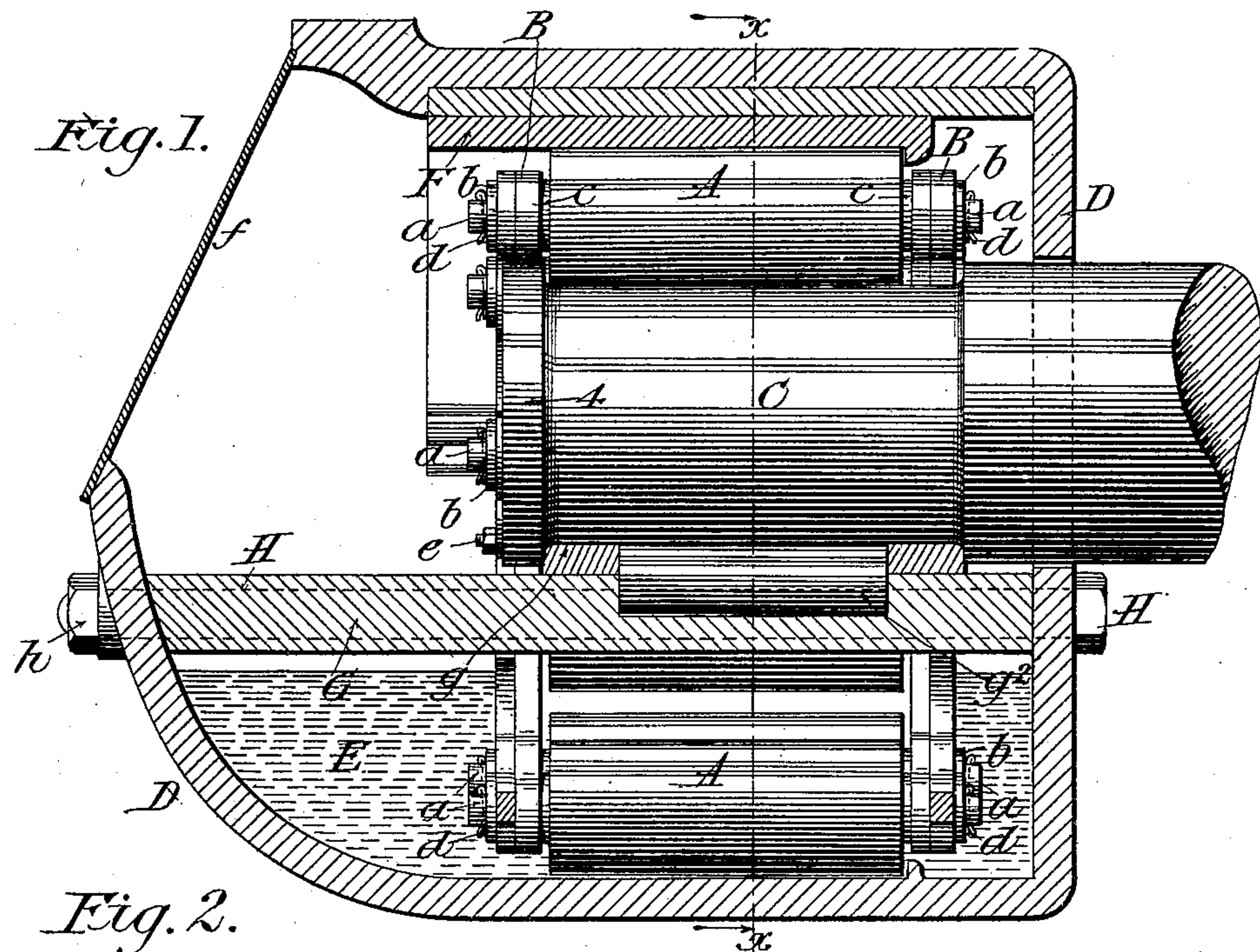
Patented Sept. 19, 1899.

W. J. BREWER.

MEANS FOR REDUCING FRICTION OF AXLES AND JOURNALS.

(Application filed May 9, 1899.)

(No Model.)



Witnesses:

A. M. Long.
Arthur C. Fowler.

Inventor.

William John Brewer
for *Wm. J. Brewer*
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM J. BREWER, OF LONDON, ENGLAND, ASSIGNOR OF ONE-HALF TO
WILLIAM A. SIMMONS, TRUSTEE, OF NEW YORK, N. Y.

MEANS FOR REDUCING FRICTION OF AXLES AND JOURNALS.

SPECIFICATION forming part of Letters Patent No. 633,116, dated September 19, 1899.

Application filed May 9, 1899. Serial No. 716,145. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM JOHN BREWER, C. E., a subject of the Queen of Great Britain and Ireland, and a resident of the city of London, England, have invented a new and useful Improvement in Means for the Reduction of Friction of Axles and Journals, of which the following is a specification.

The invention in common with others of a series having the same title consists in improved means for cradling antifriction-rollers, whereby those of a given roller-bearing for any axle or journal to which the same may be applicable are adapted not only to be removed and handled together with their revolving cradle as one piece, but are rendered capable of being adjusted at any time to take up wear and insure true and frictionless motion, the improved bearings being further provided with interchangeable wear parts that can be quickly and inexpensively replaced by new parts when the limit of adjustment is reached.

The present invention relates distinctively to the reduction of the friction of rotating axles or journals, and it is additional to my "Improvement in roller-bearings for car-axles" patented January 15, 1889, by United States Letters Patent No. 396,324.

The present invention consists in a flexible or chain cradle of improved construction whereby the series of rollers is rendered adjustable in length to compensate for the elongation of the chains by wear, and the individual roller-pivots are surrounded by renewable wear parts in the form of interchangeable castings of Babbitt metal or the like, which receive their final finish in their molds and are adapted to be slipped endwise into working position; also, in means to render such bushes spring-pressed or self-adjusting endwise; also, in the combination, with the rollers and chain-cradle, of an under bearing or keep effectively supported by a pair of through-bolts beneath the axle to prevent the jarring or dropping of the axle away from the rollers above it, and thus to prevent crushing or deforming blows upon the rollers; also, in the provision of the top of said keep with a renewable wear-plate with or without an antifriction-roller within an

opening in said wear-plate, as hereinafter described and claimed.

A sheet of drawings accompanies this specification as part thereof.

Figure 1 of the drawings represents a longitudinal section through a car-axle box embodying the invention as a whole. Fig. 2 represents a vertical transverse section on the line $x x$, Fig. 1, with the rollers and chain-cradle in elevation. Fig. 3 is a fragmentary enlarged view, partly in section, showing the details of the chain-cradle; and Fig. 4 is a fragmentary sectional view showing a modification.

Like letters and numbers refer to like parts in all the figures.

In carrying out this invention a sufficient number of longitudinal antifriction-rollers A, having cylindrical pivots a at the ends of each, are connected with each other, so as to be handled as one piece by a flexible or chain cradle B, and revolve in series between a rotating axle or journal C and a superposed bearing-surface, such as the crown of a car-axle box D, the lower part of the axle-box or equivalent housing forming an oil-chamber E, into which the rollers dip successively and thus insure ample lubrication.

The cradle B is provided with interchangeable and renewable wear parts b , surrounding the individual roller-pivots a , as bushes for the pivot-holes in the successive links of the parallel chains that form the cradle, customary washers c being introduced between the ends of the rollers and the respective chains. The wear parts b are adapted to be slipped endwise into working position and are withdrawable outwardly and are constructed with flanged outer ends b' , Fig. 3, and held in place by spring-cotters or split pins d , which are preferably and conveniently so disposed as to press the wear parts inward and keep them tight within the pivot-holes by endwise spring-pressure. The weight of the depending rollers takes up wear as it occurs at the sides of the pivots.

When the wear parts b become worn out, they are released by withdrawing the pins d and are themselves withdrawn and replaced by new parts. This is quickly and inexpensively

sively accomplished as frequently as may be necessary, the wear parts being uniform castings of Babbitt metal or the like and receiving their final finish in their molds.

5 To shorten the chain-cradle as it becomes lengthened by wear, it is provided with one or more compensating joints *e* (preferably two) at equidistant points, each in the form of a lap-joint between successive rollers tightened
10 by a screw-bolt 1, Fig. 3 or Fig. 4, and including a longitudinal slot 2 in one link part.

The axle-box D is provided with a crown-plate F, Figs. 1 and 2, preferably of chilled cast-iron or hard bronze, and removable
15 through the door *f* of the box, so as to be renewed when worn, and beneath the axle it is further provided with an under bearing or keep G to prevent the jarring or dropping of the axle away from the rollers above it, as
20 aforesaid, and having a renewable wear-plate *g*, of chilled iron or bronze, and an antifric-tion-roller *g*², or the former at least. The keep G, owing to its provision with said wear-
25 plate, may be of cast-iron or cast-steel with-out machining, except it be a seat for said roller *g*². It extends from end to end within the box, as in Fig. 1, so as to act as a strut when fastened, a pair of through-bolts H, with
30 screw-nuts *h* at the front of the box, serving to detachably secure the keep in place and at the same time to adapt it to resist any strain to which it may be subjected.

The guides I, Fig. 2, for keeping the rollers away from the sides of the axle, are detach-
35 ably secured to the sides of the keep G by screws 3, so as to be renewable.

When the rollers and chain-cradle are to be removed for adjustment or for the renewal of the wear parts, the nuts *h* are removed and
40 the bolts H withdrawn, so that the keep G may drop away from the axle. The box D is then lifted by a jack, so as to free the crown-plate F, which is then withdrawn, followed by the rollers and cradle, the box D being
45 tilted, if need be, to permit the rollers and cradle to clear the end flange 4 of the axle. After renewing the wear parts or making the required adjustments the parts are replaced, as in the drawings.

50 The chains of the cradle B, apart from their provision with said compensating joints *e* and said renewable wear parts *b*, may be of any approved construction. Two forms of link are shown in Figs. 1 to 3 and Fig. 4, respectively.

55 The former show a simple flat link construction heretofore used. Fig. 4 shows bifurcated links whereby the strain on the adjusting-bolts 1 and wear parts *b*, respectively, is better distributed. When the wear-plate *g* and
60 roller *g*² are both used, as shown, the plate may contain the roller seat or bearings for roller-pivots, so as to provide for renewing said seat or bearings when worn and for reducing its friction; and other like modifica-

tions will suggest themselves to those skilled 65 in the art.

Having thus described said improvement, I claim as my invention and desire to patent under this specification—

1. The combination with a rotating axle or 70 journal, a box therefor having an oil-chamber at bottom and a bearing-surface concentric with the periphery of the axle or journal at top, and a series of longitudinal rollers interposed successively between said bearing-sur- 75 face and said periphery in contact with both, of a chain-cradle uniting said rollers and revolving therewith without contact with said bearing-surface or periphery and comprising parallel chains, and means consisting of lap- 80 joints between successive rollers for shortening said chains to compensate for wear.

2. In a roller-bearing, the combination with longitudinal rollers having cylindrical pivots of a chain-cradle provided with pivot-holes 85 coincident with said pivots and renewable wear parts surrounding said pivots within said pivot-holes and consisting of interchangeable castings of Babbitt metal or the like adapted to be slipped endwise into working 90 position.

3. In a roller-bearing, the combination with longitudinal rollers having cylindrical pivots of a chain-cradle provided with pivot-holes 95 coincident with said pivots, renewable wear parts surrounding said pivots within said pivot-holes, adapted to be slipped into place endwise and withdrawable outwardly, and means for tightening said wear parts by end- 100 wise spring-pressure.

4. In combination with a rotating axle and a car-axle box having an internal bearing-surface at top, a roller-bearing comprising longitudinal rollers coacting with the periph- 105 ery of the axle and with said bearing-surface and a chain-cradle for said rollers, and an under bearing or keep extending from end to end within the box in contact with the bottom of the axle and a pair of through-bolts detach- 110 ably fastening and supporting said keep within the box, for the purpose set forth.

5. In combination with a rotating axle and a car-axle box having an internal bearing-surface at top, a roller-bearing within said box comprising longitudinal rollers coacting 115 with the periphery of the axle and with said bearing-surface, and a chain-cradle for said rollers, an under bearing or keep in contact with the bottom of the axle, a renewable wear-plate forming the contact-surface of 120 said keep, and means for detachably supporting said keep within the box, substantially as hereinbefore specified, for the purpose set forth.

W. J. BREWER.

Witnesses:

JAS. L. EWIN,

ARTHUR C. FOWLE.