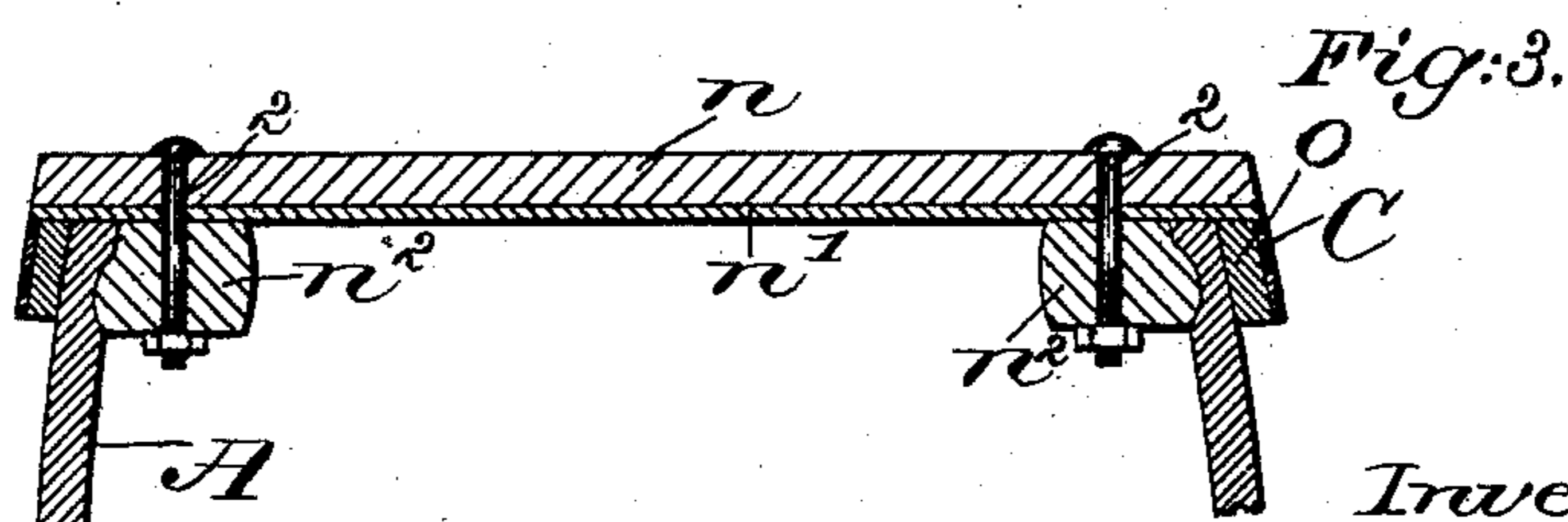
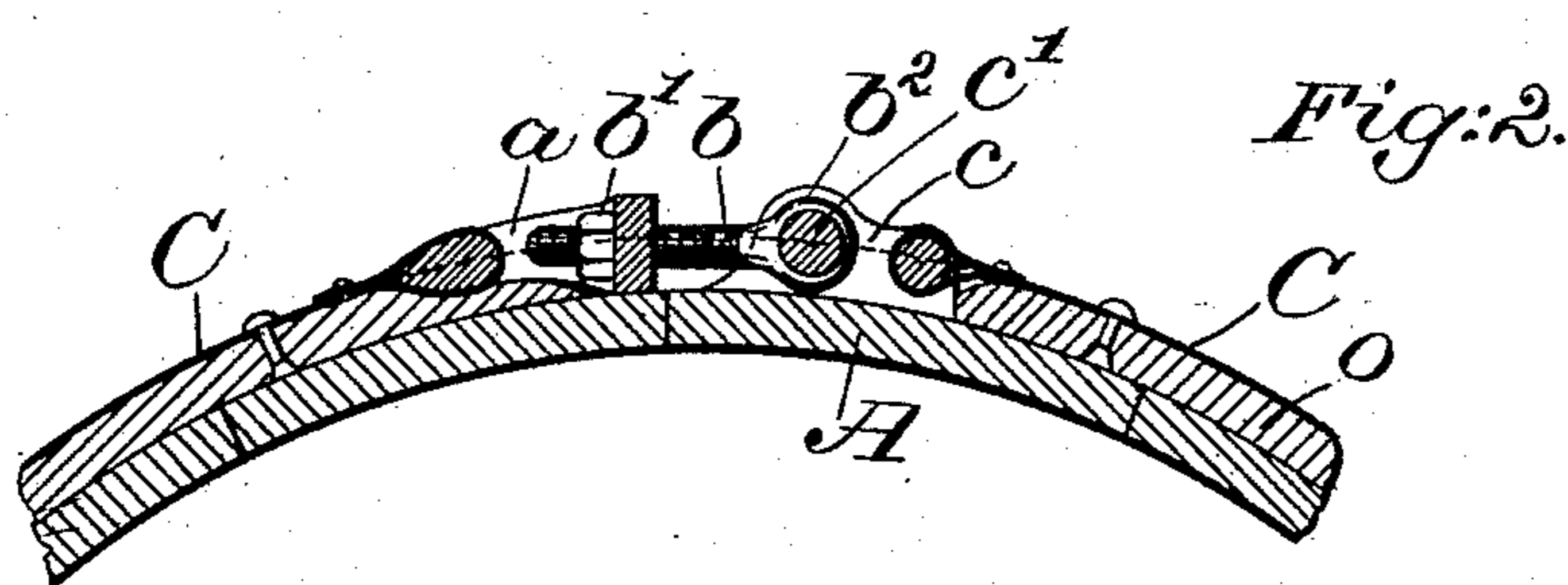
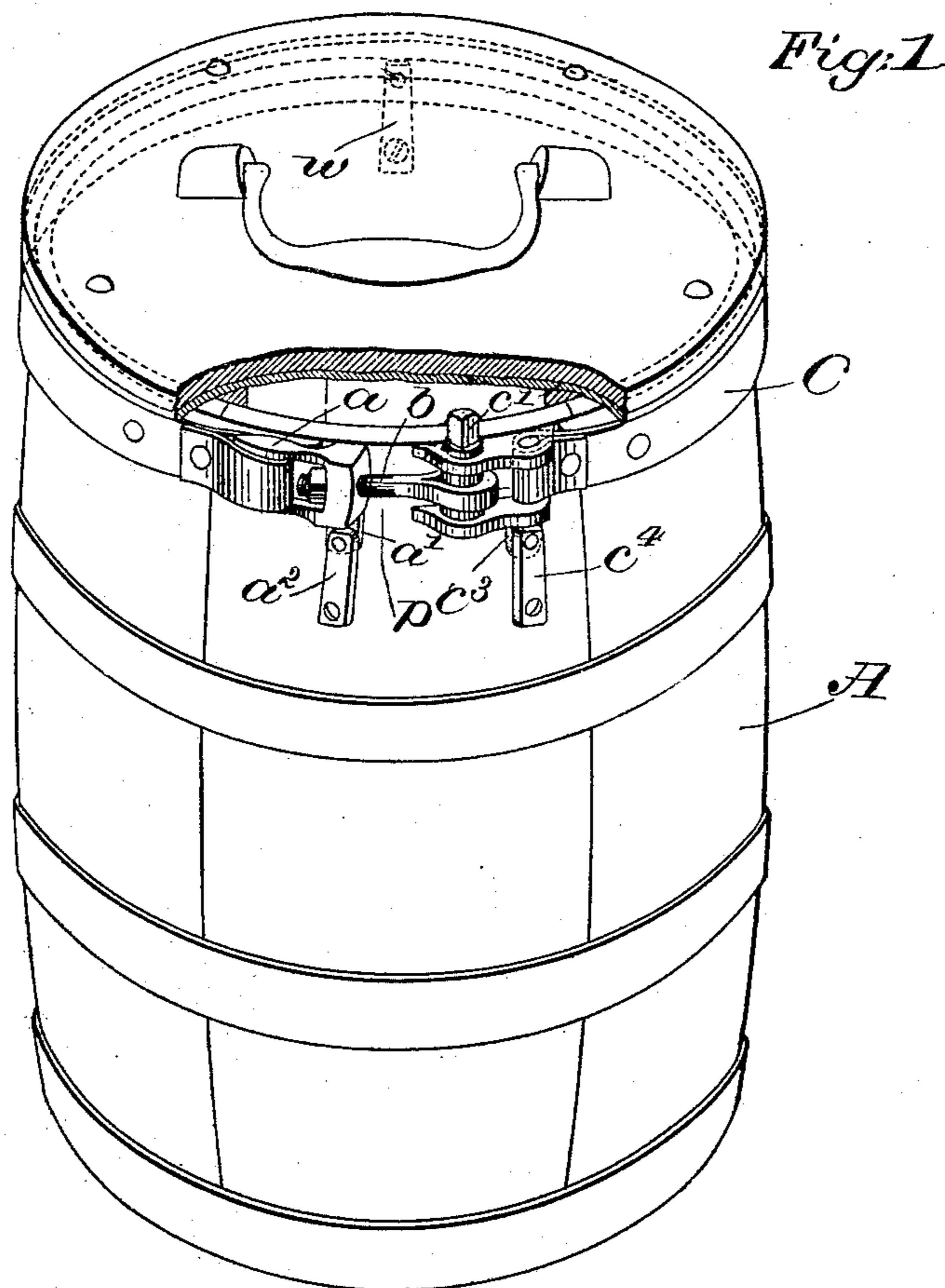


(No Model.)

G. A. LAWRENCE.
AIR TIGHT VESSEL.

No. 472,460.

Patented Apr. 5, 1892.



Witnesses.

Fred M. Ashworth.
Fred S. Greenleaf.

Inventor.
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UNITED STATES PATENT OFFICE.

GEORGE A. LAWRENCE, OF SALEM, MASSACHUSETTS, ASSIGNOR OF THREETENTHS TO CLARENCE S. CLARK AND HARRY D. TREADWELL, OF SAME PLACE.

AIR-TIGHT VESSEL.

SPECIFICATION forming part of Letters Patent No. 472,460, dated April 5, 1892.

Application filed January 29, 1892. Serial No. 419,639. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. LAWRENCE, of Salem, county of Essex, State of Massachusetts, have invented an Improvement in Air-Tight Vessels, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object to construct a vessel adapted to be made air-tight without using packing for the purpose.

In accordance with this invention a hoop or band made of suitable length to embrace the upper end of the vessel has connected to each end a block. One of the blocks has mounted in it an eccentric adapted to be turned by a suitable wrench or other suitable implement, and a link or other suitable connecting member is mounted on said eccentric, and is also loosely connected to the other block, so that by turning said eccentric the blocks will be moved toward and from each other. The hoop or band is applied outside of a wooden or other hoop inclosing the staves, which wooden hoop may be the usual top hoop. In order that the blocks may be moved toward each other in such a manner that the draft on the band will be in a direct line with the band itself and also through the center of the fastening, the wooden or foundation hoop is cut away to provide a recess in which said blocks are set. Means are provided for adjusting the parts, so that they may be made to accommodate variations in thickness of the staves, &c. The blocks are each connected to the vessel by suitable links, which will hold them in place, yet permit them to be moved slightly, as required, and so also the band is connected loosely to the vessel by one or it may be more links. A special form of cover is provided, which snugly fits the vessel and which, when the clamping hoop or band is drawn taut, insures the vessel being air-tight.

Figure 1 shows in perspective a clamping hoop or band for vessels embodying this invention; Fig. 2, a horizontal section of a portion of the vessel and clamping hoop or band, showing the fastening by means of which the ends of the hoop or band are drawn together;

and Fig. 3 a vertical section showing the cover.

The vessel A, of usual or suitable construction, but herein represented as composed of staves, has fitted into it a cover. The cover (see Fig. 3) is represented as a head *n*, made large enough to cover the entire top of the vessel and having on its under side a lining *n'* of galvanized iron, by means of which moisture is prevented from coming in contact with the head *n*, and an annular rim *n*² is secured by rivets 2 or otherwise to the under side of the metal plate *n'*, said rim having a convexed outer face, which enters a concaved recess formed in the vessel at or near the top. A wooden hoop *o* embraces the upper end of the vessel at the point opposite the rim *n*². The clamping hoop or band C encircles the upper end of the vessel outside of the wooden hoop *o*, and said wooden hoop is cut away or recessed for a short distance, as at *p*. At one end of said hoop or band C a block *a* or loop is secured, it being herein represented as made with an opening through it, so that the end of the hoop or band can be passed therethrough and turned over upon itself and riveted. That portion of the block *a* over which the band is turned is made tapering, as best shown in Fig. 2, and said block is placed in the recess *p*, so that a line which will form a continuation of the band C will pass through the center of the block, as represented by dotted lines. An eyebolt *b* is provided, the screw-threaded shank or end of which passes through a hole in one end of said block *a*, entering the opening therein, and on said screw-threaded end, within said opening, a nut *b'* is turned. A block *c* is secured to the opposite end of the hoop or band C, it having an opening through it, through which the end of said hoop or band is passed and turned over upon itself and riveted, as best shown in Fig. 2. An eccentric shaft or stud, as *c'*, has its bearings in said block *c*, it having a squared end *c*² to receive a wrench or other suitable implement by means of which said eccentric-stud may be turned. This eccentric-stud passes through or receives upon it the eye *b*² of the eyebolt. The block *c* is also placed in the said recess *p* and occupies

a plane so that a line which will form a continuation of the hoop or band C will pass through the center of said block and through the axis of said eccentric, as represented by
5 dotted line, Fig. 2.

In order that the recess may be of the proper depth that the blocks *a* and *c* may occupy the proper planes relative to the hoop or band C, the wooden hoop will be made of a thickness
10 equal to the distance from the bottom of the block *c* to the center or axis of the eccentric. By turning said eccentric-stud in one or the other direction the blocks *a* *c* will be moved
15 toward or from each other to thereby slacken or tighten the hoop or band C, and the line of draft on the hoop or band is in a direct line through the center of the blocks which constitute the clamping or tightening device, thereby obtaining a uniform strain around the
20 vessel. The block *c* is so shaped at its under side as to bear flatly and firmly upon or against the vessel, and said blocks *a* and *c* are so located as to nearly meet, so that the space between them will be very small. The block *a*
25 has upon its lower edge a lug or ear *a'*, to which is loosely connected a short link *a²*, which in turn is connected to the vessel, and the block *c* has upon its lower edge a lug or ear *c³*, to which is loosely connected a short
30 link *c⁴*, which in turn is loosely connected to the vessel. The blocks *a* and *c* are thereby permanently connected to the vessel, but freely movable in either direction. The hoop or band C is also connected to the vessel by a link, as
35 represented by dotted lines *w*, Fig. 1, such connection enabling a longitudinal movement of said hoop or band.

The eyebolt or connecting-link *b* is screw-threaded, as shown, merely for the purposes
40 of adjustment, and after once having been set by means of the nut *b'* the blocks *a* and *c* will be moved toward and from each other simply by turning the eccentric, so that the said screw-threads may be omitted, if desired,
45 the part *b* being connected loosely with the block *a*. When the hoop or band C is drawn taut and a uniform tension or bearing exerted at all points, the cover will be held in position so firmly that the vessel will be air-
50 tight and no yielding packing will be necessary.

In clamping hoops or bands heretofore made, so far as I am aware, the fastenings have been such that when the ends of the
55 hoop or band were brought together the parts of said fastenings would rock or tip or bear with unequal pressure upon the vessel, and in all such instances the vessel cannot be closed air-tight without the use of packing.

60 I claim—

1. The vessel A and cover therefor, combined with the hoop or band C, the block *a*, secured to one end, and the block *c*, secured to the other end of said hoop or band, and ec-
65 centric *c'*, supported by said block *c*, and the

part *b*, connected with the block *a* at one end and with the eccentric *c'* at the opposite end, substantially as described.

2. The vessel A and cover therefor, combined with the hoop or band C, the block *a*,
70 secured to one end, and the block *c*, secured to the other end of said hoop or band, the eccentric *c'*, mounted in the block *c*, and the eyebolt on said eccentric *c'*, having its screw-threaded end projected through a hole in the
75 block *a*, and the nut *b'*, turned on said screw-threaded portion, by means of which the parts are adjusted, substantially as described.

3. The vessel A and cover therefor, combined with the hoop or band C, the block *a*,
80 secured to one end thereof, and the block *c*, secured to the other end thereof, the eccentric *c'*, mounted on the block *c*, and the connecting part *b*, mounted on said eccentric *c'* and loosely connected with the block *a*, lugs
85 or ears on said blocks *a* and *c*, and links *a²* *c⁴*, connected to said lugs or ears and to the vessel, substantially as described.

4. The vessel A and cover therefor, combined with the hoop or band C, block *a*, se-
90 cured to one end thereof, and the block *c*, secured to the other end thereof, the eccentric *c'*, mounted on the block *c*, and the connecting part *b*, mounted on said eccentric *c'* and loosely connected with the block *a*, lugs or
95 ears on said blocks *a* and *c*, and links *a²* *c⁴*, connected to said lugs or ears and to the vessel, and a link connecting the hoop or band to the vessel, substantially as described.

5. The vessel A, having on it the hoop *o*,
100 cut away or recessed, as described, combined with the hoop or band C on said hoop *o* and the tightening device for said hoop or band C, set down in said recess, whereby the draft on the band may be in a direct line through
105 the center of the tightening device, substantially as described.

6. The vessel A, having on it the hoop *o*, cut away or recessed, as described, combined with a hoop or band C on said hoop *o*, and
110 the tightening device comprising the blocks *a* and *c*, and the connecting part *b*, set down in said recess, substantially as and for the purposes set forth.

7. The vessel A and clamping hoop or band
115 therefor, comprising the band and the tightening device, combined with a cover for said vessel comprised of a head *n*, metal plate or lining *n'*, and annular rim *n²*, having a convexed outer face to enter a concaved recess in the
120 vessel, substantially as and for the purposes set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE A. LAWRENCE.

Witnesses:

BELLA MURRAY,
JOHN P. FERNALD.