

No. 613,838.

Patented Nov. 8, 1898.

A. HEBERER.

HEADER FOR SECTIONAL STEAM GENERATORS.

(Application filed May 22, 1896. Renewed Mar. 23, 1898.)

(No Model.)

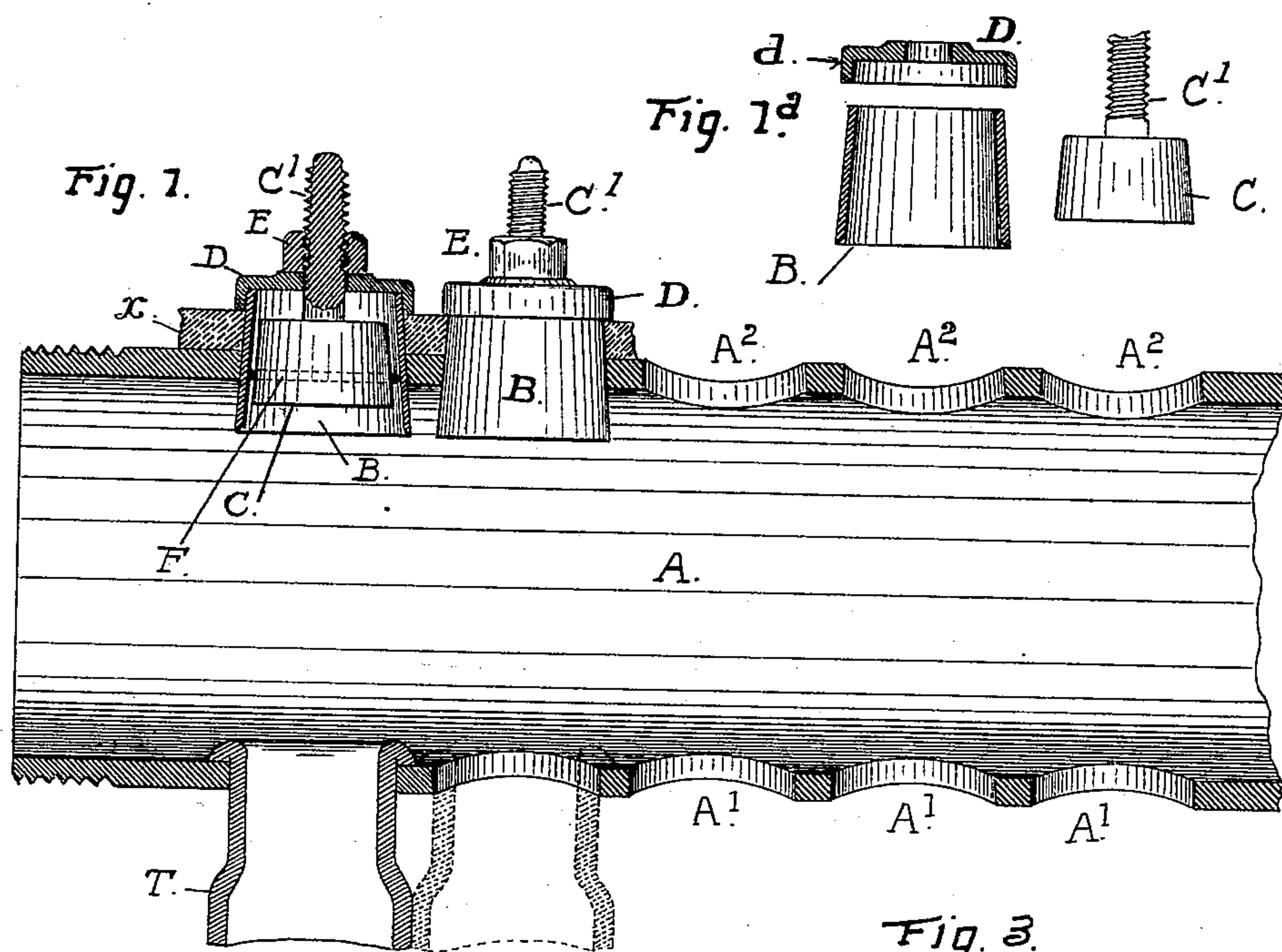


Fig. 3.

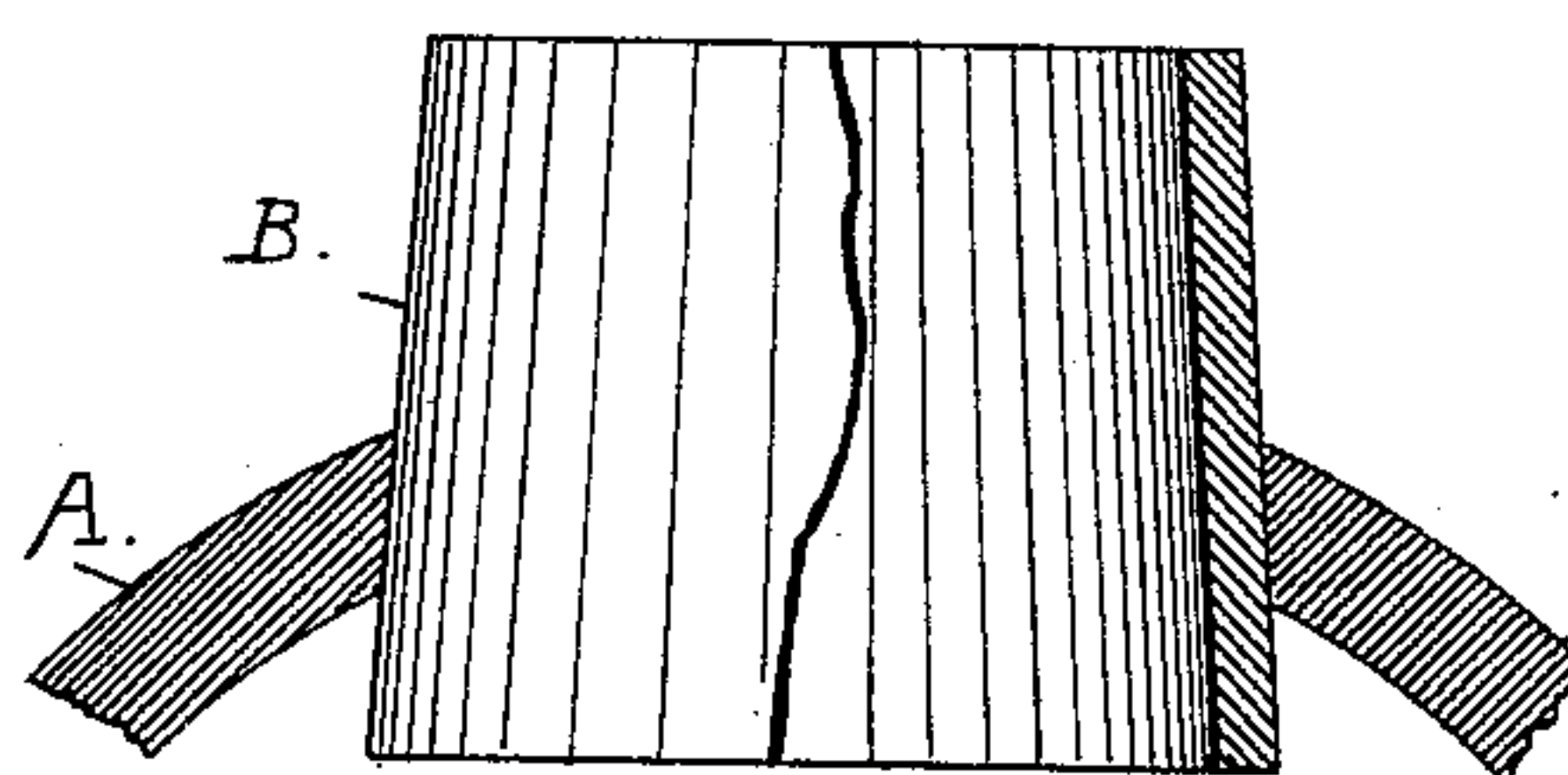


Fig. 4.

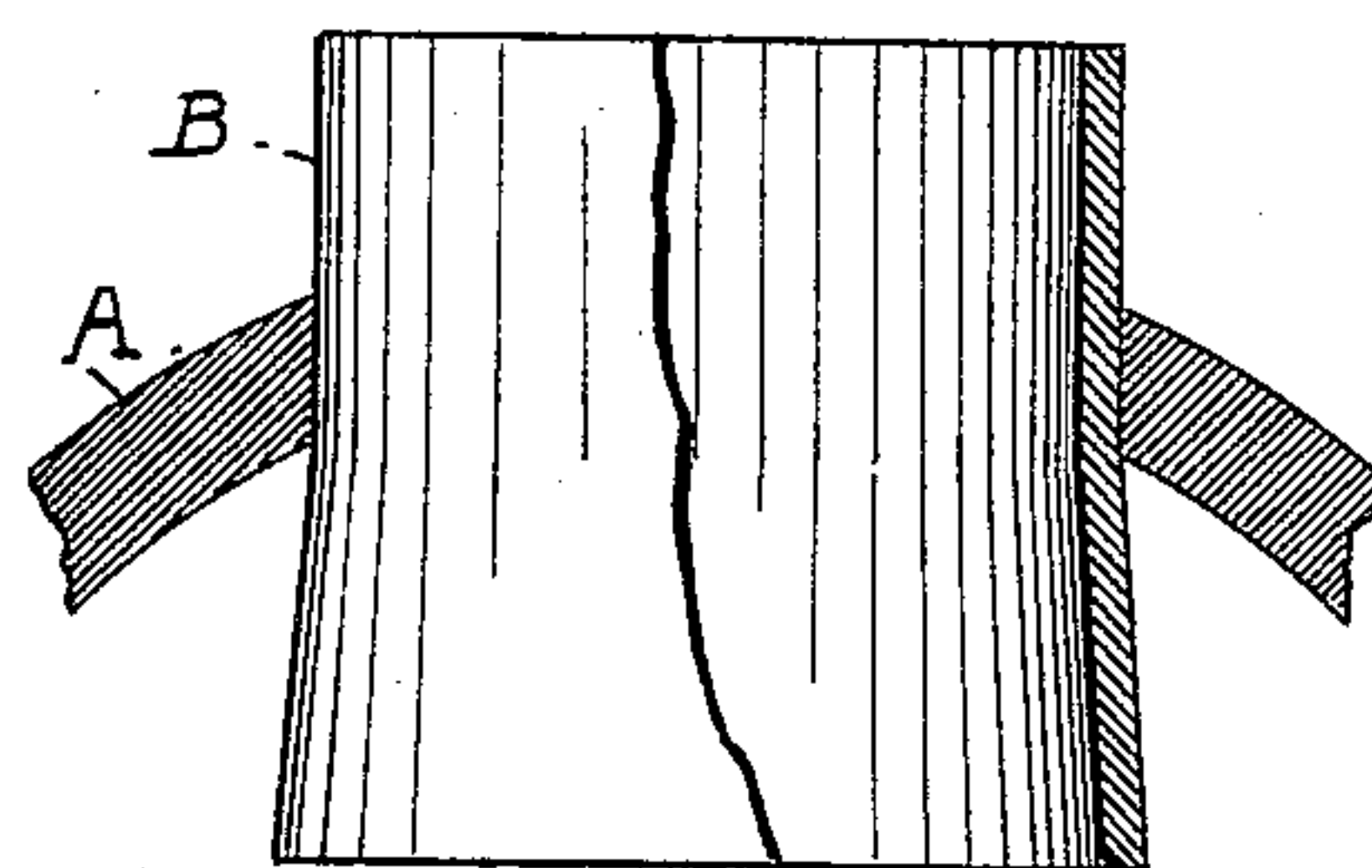
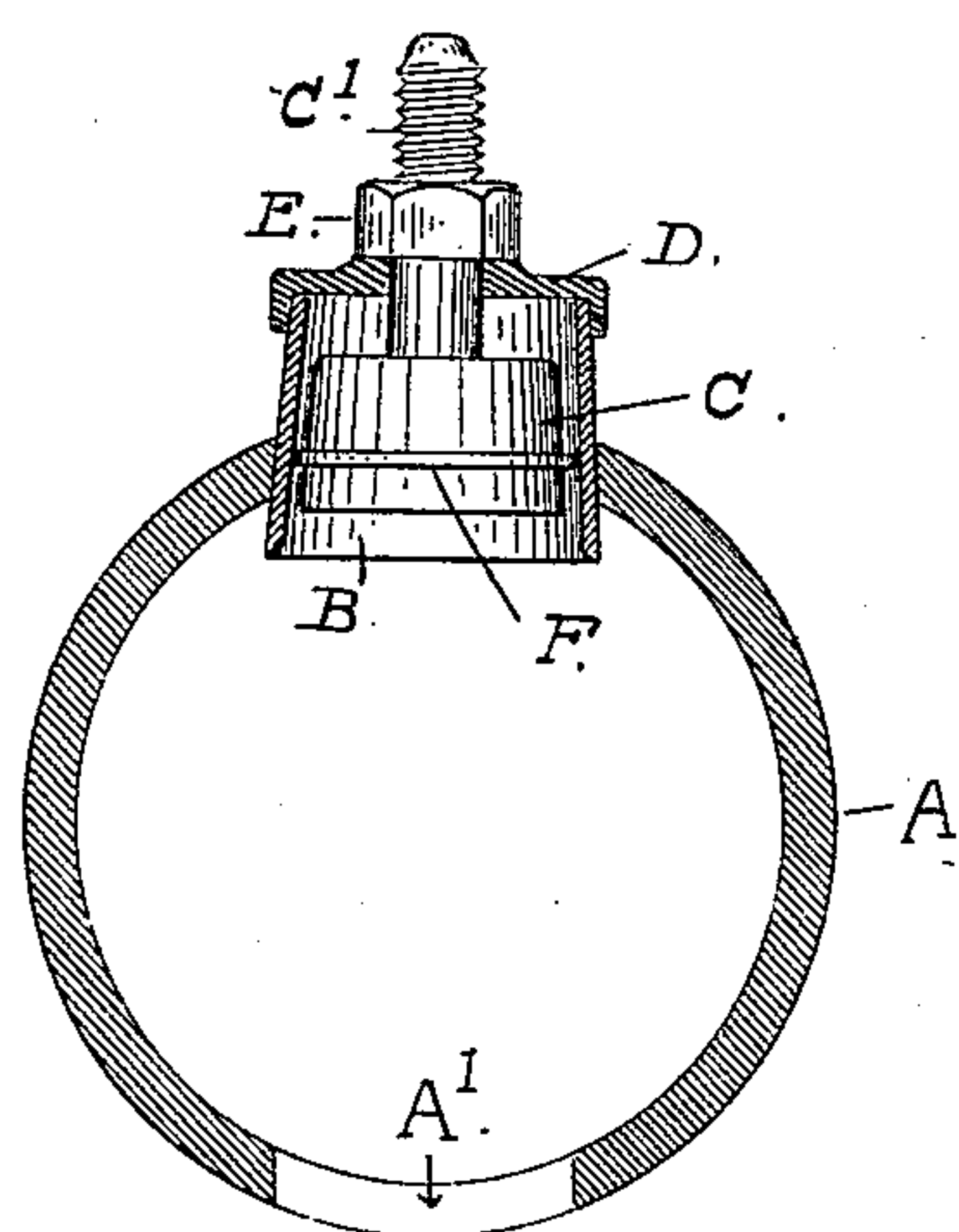


Fig. 2.



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UNITED STATES PATENT OFFICE.

ADAM HEBERER, OF ALAMEDA, CALIFORNIA.

HEADER FOR SECTIONAL STEAM-GENERATORS.

SPECIFICATION forming part of Letters Patent No. 613,838, dated November 8, 1898.

Application filed May 22, 1896. Renewed March 23, 1898. Serial No. 674,940. (No model.)

To all whom it may concern:

Be it known that I, ADAM HEBERER, a citizen of the United States, residing in the city of Alameda, county of Alameda, and State of California, have invented certain new and useful Improvements in Headers for Sectional Steam-Generators, of which the following is a specification.

This invention relates to improvements in the construction of header-tubes for multi-tubular steam-generators, and more particularly to an improved construction of header-tube for the generator heretofore invented by me and described in Letters Patent of the United States No. 566,395, issued to me on the 25th day of August, 1896.

The present improvements have for their objects to substitute a wrought-metal construction for the cast-metal header-tubes and in such connection to dispense with the use of screw-joints, packing, or calking and to enable hand-hole openings to be located in the required close relation without reducing the effective working strength of the header-tube.

To such ends and objects the said invention consists in the improved construction of header-tube, stopper-seat, and stopper, and the combination thereof, producing a steam-tight joint that increases in effectiveness with the pressure of the steam from the inside, as hereinafter fully described, and pointed out in the claim.

The following description explains at length the nature and the manner of constructing and carrying out my said improvements, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents in longitudinal section a portion of a header-tube constructed according to my said improvements with two of the hand-hole stoppers and the ferrules that form the seat represented in section. Fig. 1^a represents the parts in detail composing the hand-hole stopper and its seat; Fig. 2, a vertical cross-section through *x x*, Fig. 1; Figs. 3 and 4, cross-sections, on an enlarged scale, of the upper portion of the header-tube and the ferrules that form the stopper-seats. In the two last-mentioned views are represented two ferrules of slightly different shape.

A indicates a portion of a wrought-metal

header-tube. A' are openings cut in the lower side of the tube, into which are inserted and fixed the steam-generating tubes by expanding the end of the tube from the inside in the usual manner. A portion of one of these tubes is shown at T, Fig. 1.

A² are openings cut in the top side of the header-tube or that side which is directly opposite the openings A', and one of such openings is located directly over and in line with every tube-opening A'. The opening A² is cut of proper shape to receive and be filled by a tapering ferrule B, and the edges of the opening are finished for that purpose to fit closely around the body or exterior surface of the ferrule, so that a tight joint is produced when the ferrule is forced into place in the opening from the inside of the header-tube. The ferrule is made of a section of wrought-metal tube of less length than the diameter of the header-tube and ordinarily of proper length to stand a short distance above the outside face of the header-tube and to extend downward into the header-tube a sufficient amount to set below the stopper when that part is drawn to a tight seat within the ferrule. Both the outside and the inside surfaces of the ferrule are formed with a slight taper of such extremes of diameters that the smaller end is easily inserted from the inside of the header-tube upward into the opening A², while the end portion of greater diameter will fit tightly into the opening and cannot be drawn or forced through it. When properly shaped and fitted to the opening, a steam-tight joint is produced without calking or packing of any kind.

C indicates a metal stopper of conical shape having a screw-threaded stem C' in the center of its top surface, the taper of its rim or body being made to correspond with the internal taper of the ferrule and the surfaces being finished to produce a close fit when the stopper is drawn to a seat within the ferrule.

D is a circular cap or cover having a flat bottom surface to set upon the projecting top end of the ferrule and provided with a hole for passage of the screw-stem C' and a flanged rim *d*, that fits over the end of the ferrule.

E is a nut on the screw-threaded portion of the stem, by which the stopper is drawn upward into the ferrule and the cap is pressed

down to a seat against the top end of the ferrule.

In constructing the above-named parts the stopper and the ferrule that forms its seat in the hand-hole are generally made of such relative diameters that the stopper at its greatest diameter is somewhat smaller than the internal diameter of the ferrule at its smallest end in order that the stopper may be inserted into and withdrawn from its seat in the ferrule through the smaller end, and a tight joint is then produced between the stopper and the surrounding seat by setting in a packing-ring or gasket F, of soft or compressible metal, between the stopper and the surrounding surface of the ferrule after such part is introduced into the ferrule, but before it is drawn up to a tight seat. This ring F is readily introduced from the outside by bending it slightly into an oblong shape and bending it to a circle again before dropping it over the conical body of the stopper. This ring, being compressed between the stopper and the seat when the stopper is drawn up to place, is of proper thickness to prevent the stopper from being forced outward by the steam-pressure within the tube. This construction has the advantage of producing a close steam-tight joint between the ferrule and the surrounding edge of the hand-hole in which it is set, because the pressure of the steam received against the bottom or back of the stopper has the effect to press the tapering ferrule all the more tightly into the opening and to a close seat in it.

In addition to the saving in cost of constructing and fitting a considerable number of seats and stoppers in a header-tube of this

character by dispensing altogether with screw-joints and packing to secure steam-tight joints the construction renders it possible to place the generating-tubes in the desired close relation with one another and at the same time provide a hand-hole opening over every generating-tube, both for convenience in setting up and joining the tubes and for reaching every tube to clean the same.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The combination, with a header-tube joining a number of steam-generating tubes together, into which said tubes are inserted and fixed from one side; of a hand-hole opening in the opposite side of the header-tube over the end of the generating-tube, a tapering ferrule fitted closely into said opening having its larger end portion extending part way into the header-tube and the smaller end standing above the outside surface of said tube, a conical stopper fitted to said ferrule with a soft-metal packing-ring, a screw-threaded stem on the stopper, a cap setting on the standing end of the ferrule through which the stem extends to the outside, and a nut on said stem as a means of drawing up the stopper to a seat within the tapering ferrule and the cap to a seat on the outer end thereof, constructed for operation as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

ADAM HEBERER. [L. S.]

Witnesses:

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