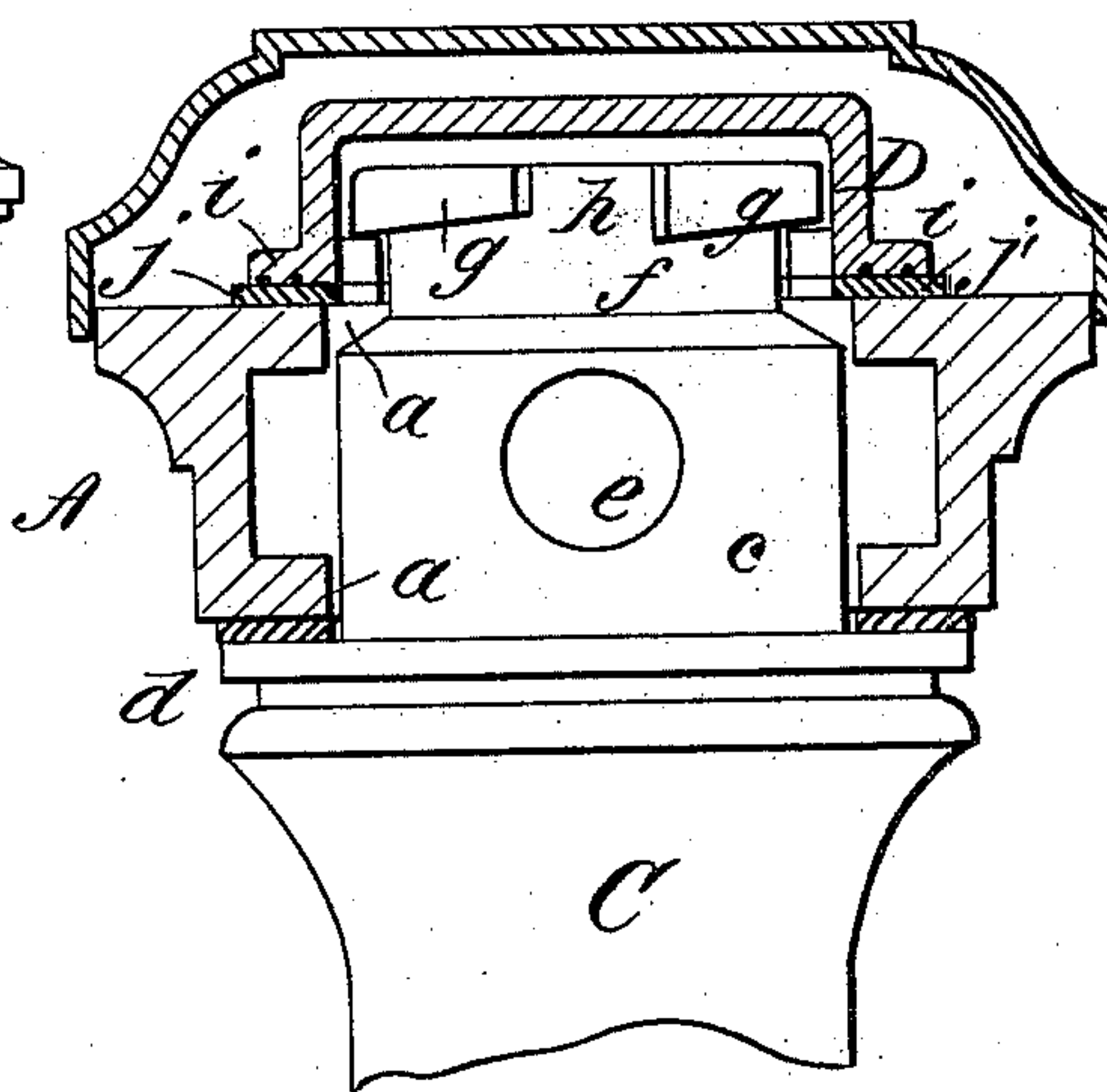


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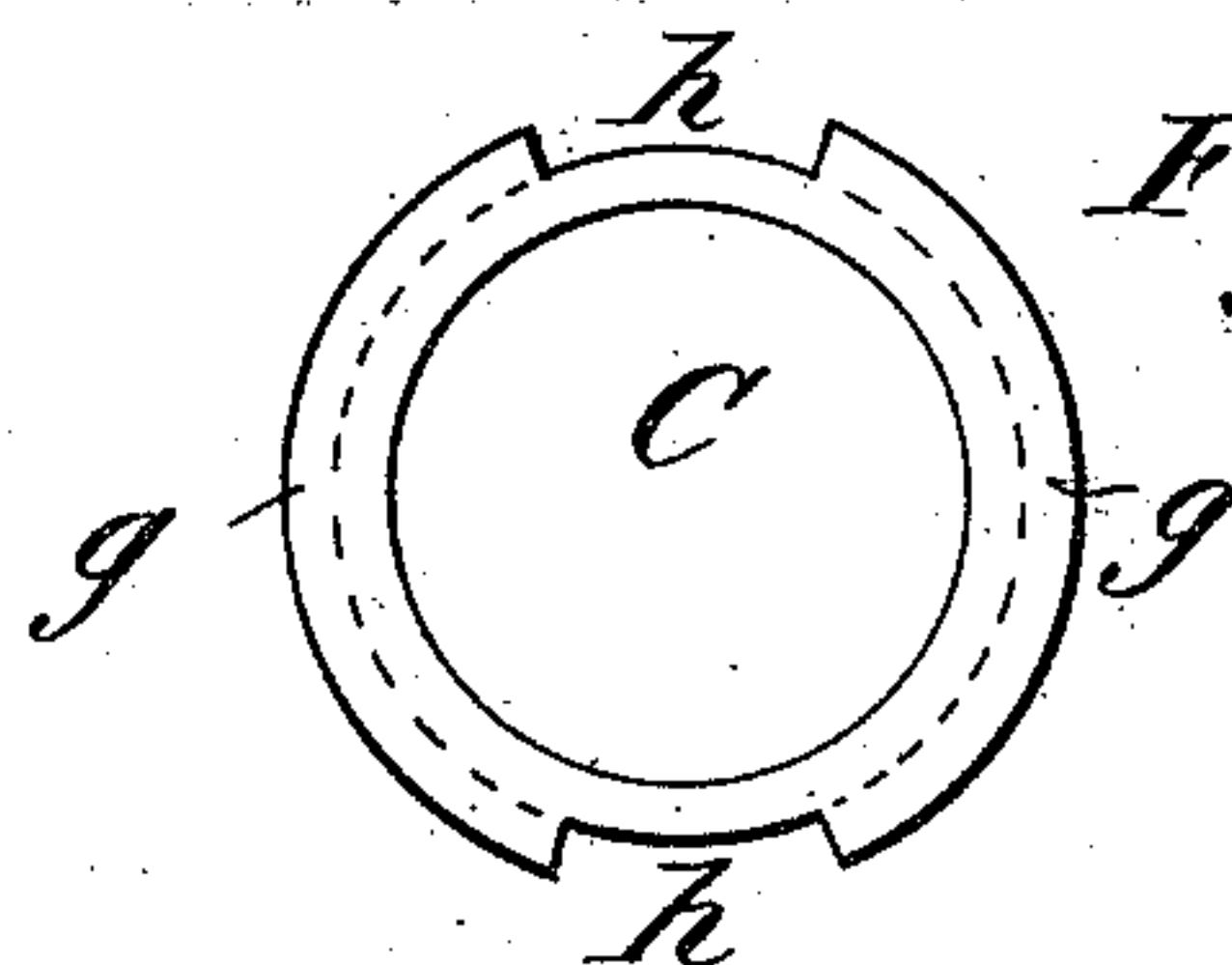
No. 310,634.

Patented Jan. 13, 1885.

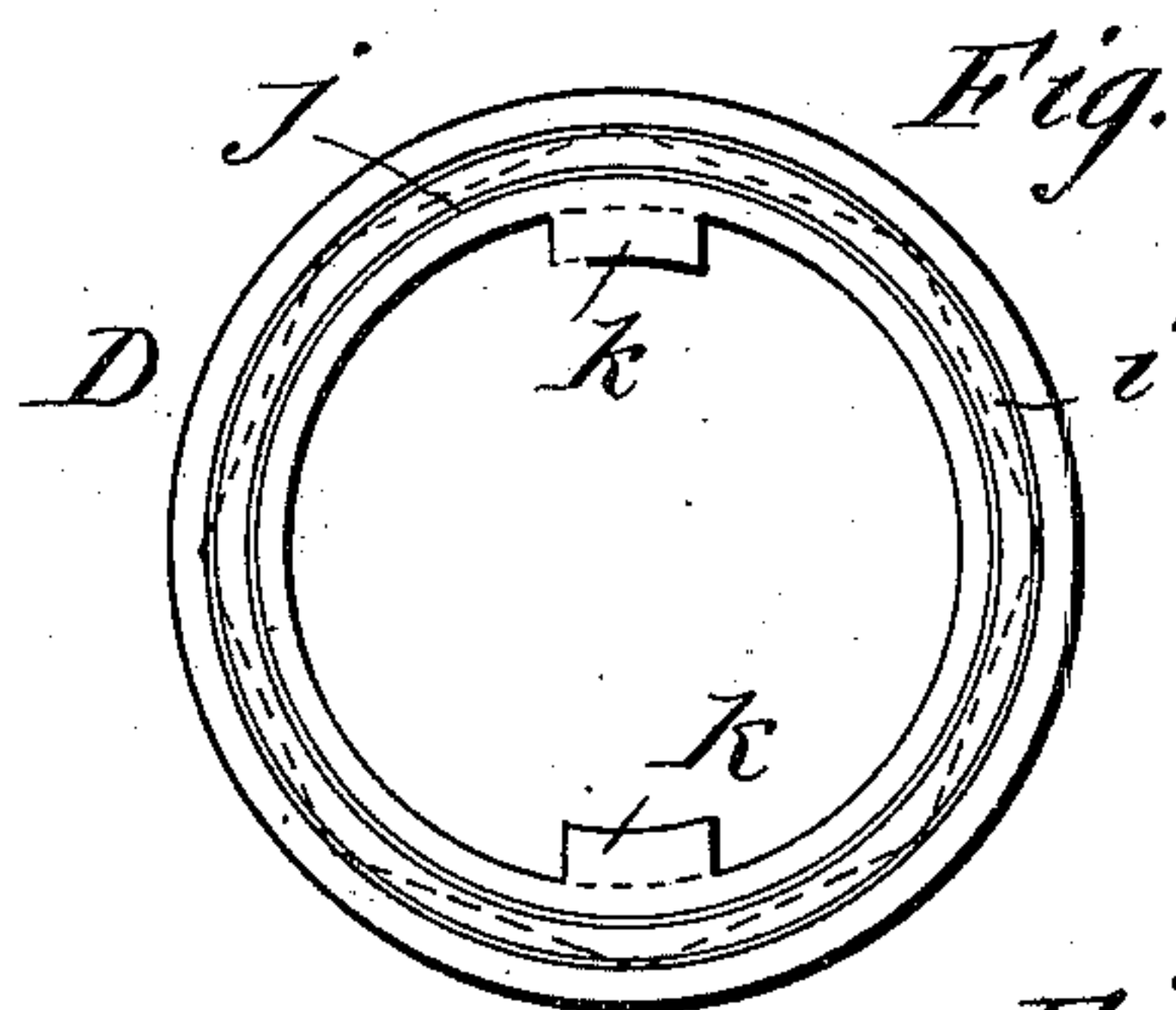
*Fig. 2.*



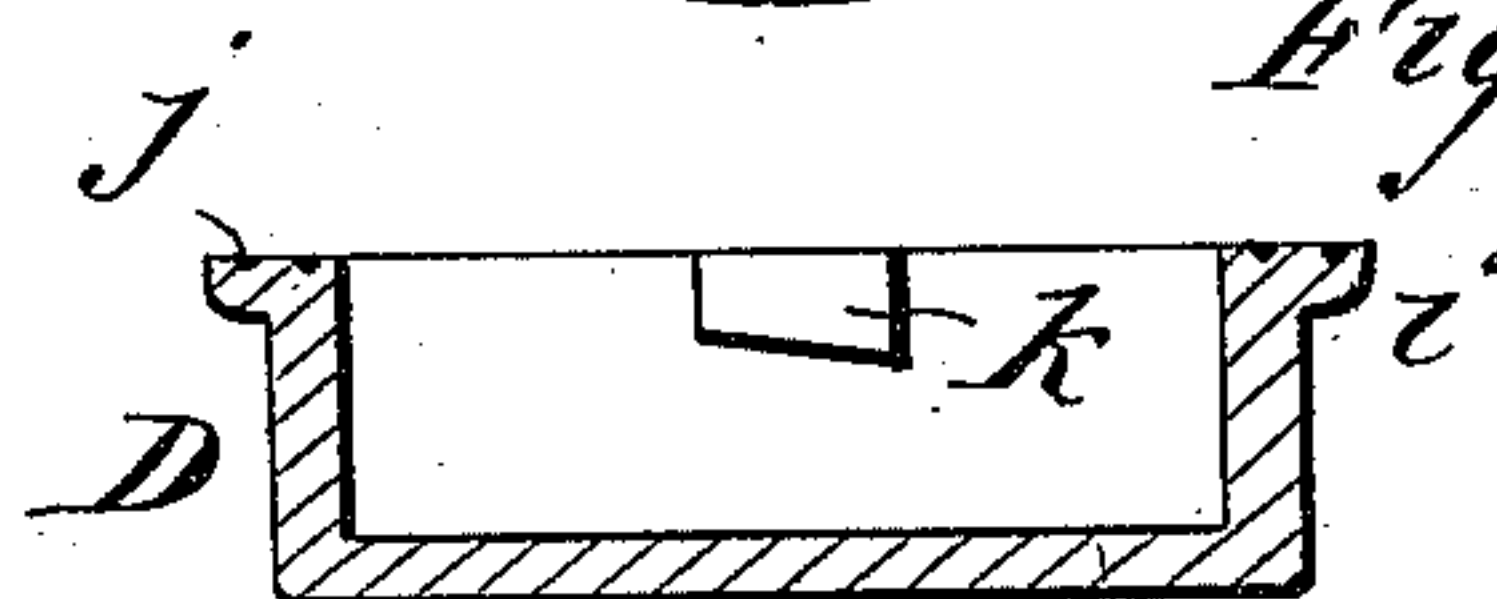
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

JUAN B. ARCI AND JOHN CHAPMAN, OF BROOKLYN, NEW YORK.

## STEAM-RADIATOR.

SPECIFICATION forming part of Letters Patent No. 310,634, dated January 13, 1885.

Application filed January 30, 1884. (No model.)

*To all whom it may concern:*

Be it known that we, JUAN B. ARCI and JOHN CHAPMAN, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Steam-Radiator, of which the following is a full, clear, and exact description.

This invention relates to that class of steam-radiators which are composed of upper and lower steam-chambers and several connecting pipes or tubes; and the invention consists, principally, in such construction of the chambers and tubes that the tubes are adapted to reach through the chambers, so as to receive nuts or caps at their outer ends, the tubes being formed with cam flanges or grooves and the caps or nuts with suitable inwardly-projecting lugs to fit in the grooves, whereby the tubes and chambers may be joined together, forming the radiator complete without any extra fitting of the parts.

The invention also consists of the construction, arrangement, and combination of parts, all as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a partly sectional elevation of our new and improved radiator. Fig. 2 is a detailed sectional elevation showing one end of the tube and one nut or cap and part of the upper chamber. Fig. 3 is an end view of one of the tubes. Fig. 4 is a face view of one of the nuts, and Fig. 5 is a sectional elevation of the same.

A represents the upper chamber, and B the lower chamber; and C C represent the circulating or connecting pipes or tubes, and D D the coupling nuts or caps. The chambers A B are cast with the corresponding openings *a a* and *b b* through their upper and lower walls. The tubes C C are cast open at both ends and with the shanks *c c*, which fit the openings *a b*, and reach through the chambers A B. They are also cast with shoulders or flanges *d d* for the said chambers to abut against; also with the side openings, *e e*, which communicate with

the interior of the said chambers, and with the inclined or cam grooves *f f*, which form the cam or inclined flanges *g g*, which are cut away at *h h*. The caps or nuts D D are each cast with a flange, *i*, which have the shallow grooves *j j* formed in their inner surfaces to receive suitable packing, *j'*, and they are also cast with the inwardly-projecting lugs *k k*, which are adapted to pass through the cut-away places *h h*, and enter the cam-grooves *f f* under the cam-flanges *g g*, so that by turning the nuts or caps the tubes C, chambers A B, and caps D will be joined and drawn together, as will be understood from the drawings, the packing *j'* causing perfectly steam-tight joints to be formed between the caps or nuts and the outer surfaces of the chambers A B. By this construction it will be seen that the radiator is practical, and that no extra fitting, such as the forming of screw-threads, &c., is required in preparing the parts composing the radiator to be put together, and that therefore our radiator is made very cheap. Packings *d'* are to be provided between the flanges *d* of the tubes C and the chambers A B.

We are aware that the tubes connecting the two steam-chambers have been secured in the upper one by nuts screwed on the said tubes on opposite sides of the said chamber, and we therefore do not claim such invention. By our construction the radiator may be cast and set up for use without making any screw-threads upon the tubes or providing screw-threaded nuts, thus rendering the radiator very cheap and practical.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a radiator, the combination, with the chambers A B, provided with the openings *a b b*, of the tube C, provided with the collars *d*, the shank *c*, and the cam-flange *g*, having cut-away spaces *h*, and the cap D, provided with the flange *j*, and the inwardly-projecting lugs, K, substantially as herein shown and described, whereby the collars of the tubes will be drawn tightly up against the openings

of the chambers when the said caps are secured upon the shanks of the tubes, as set forth.

2. The open-ended tubes C, formed with  
5 shoulders *d*, shanks *c*, having side openings, *e*,  
and cam-flanges *g*, which are cut away at *h*,  
in combination with the chambers A B, having  
corresponding openings *a a* and *b b*, and  
the caps D, having flanges *i* and inwardly-

projecting lugs *k*, arranged to act with the  
cam-flanges *g*, substantially as and for the  
purposes set forth.

JUAN B. ARCI.  
JOHN CHAPMAN.

Witnesses:

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GEO. B. STODDART.