

(No Model.)

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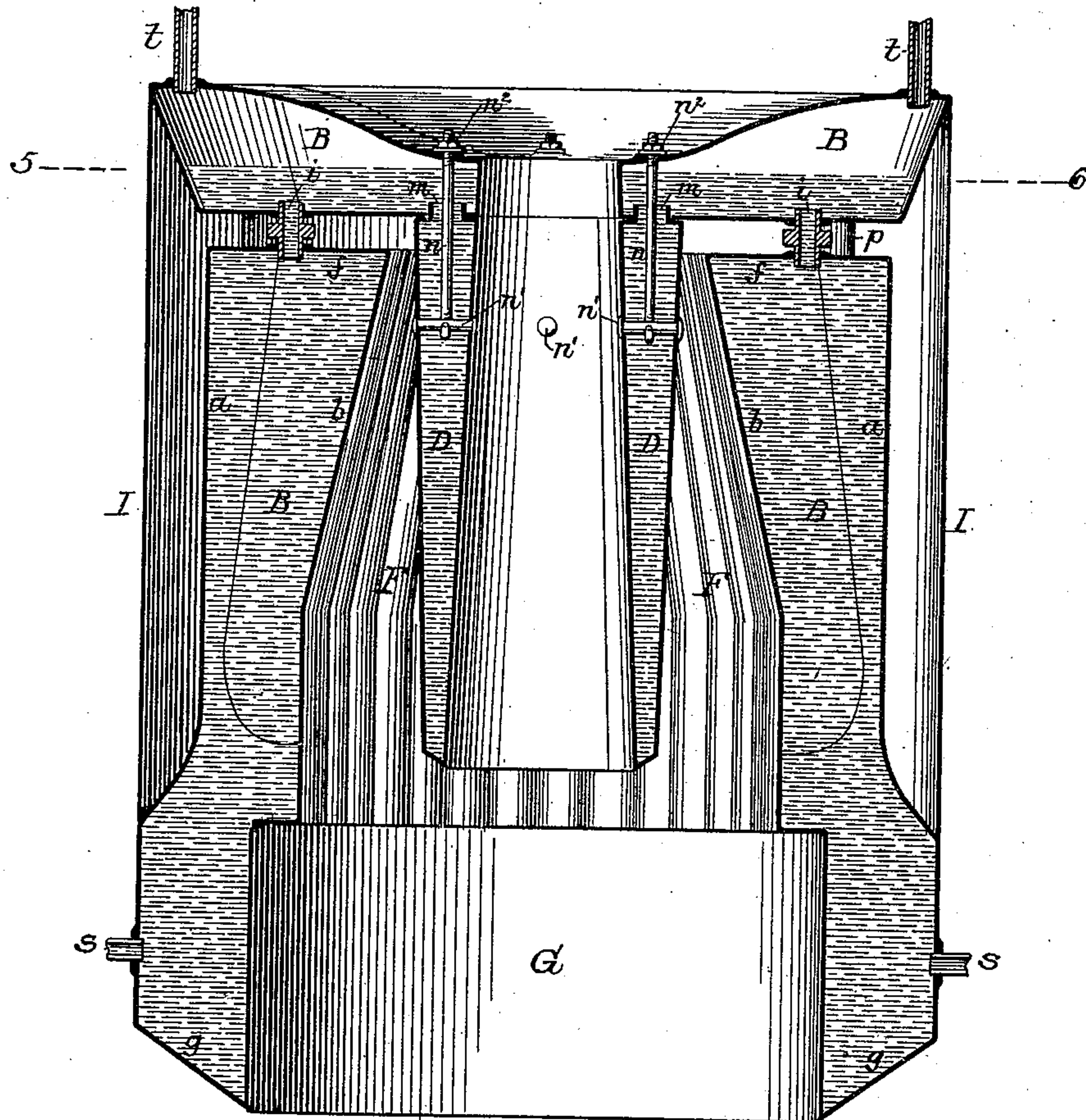
W. BURLING.

STEAM GENERATOR OR WATER HEATER.

No. 465,239.

Patented Dec. 15, 1891.

FIG. 1



Witnesses:  
*Edw D Goodwin*  
A. V. Groups.

Inventor:  
*William Burling*  
by his Attorneys  
*Howson & Howson*

(No Model.)

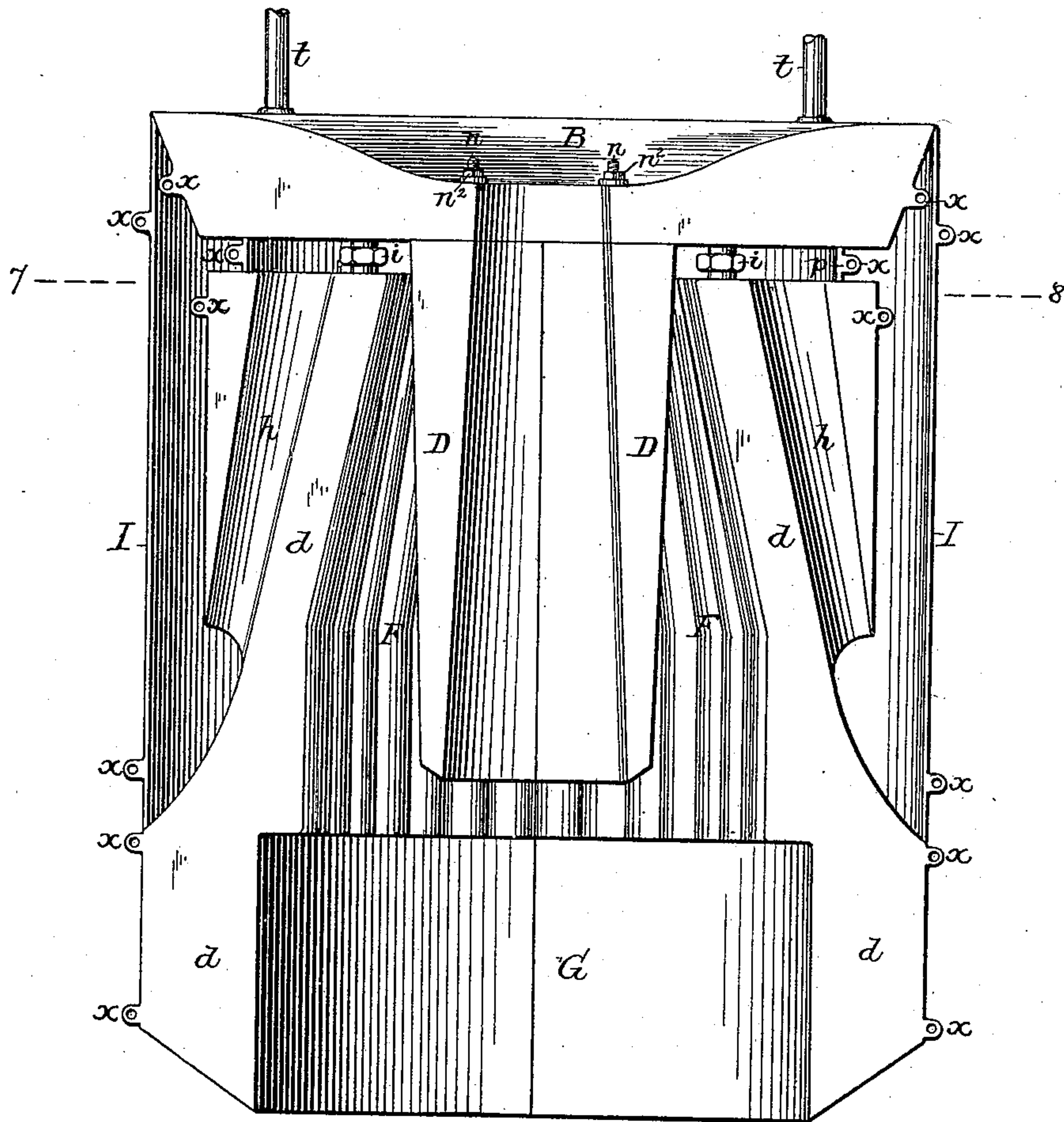
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FIG. 2.



Witnesses:  
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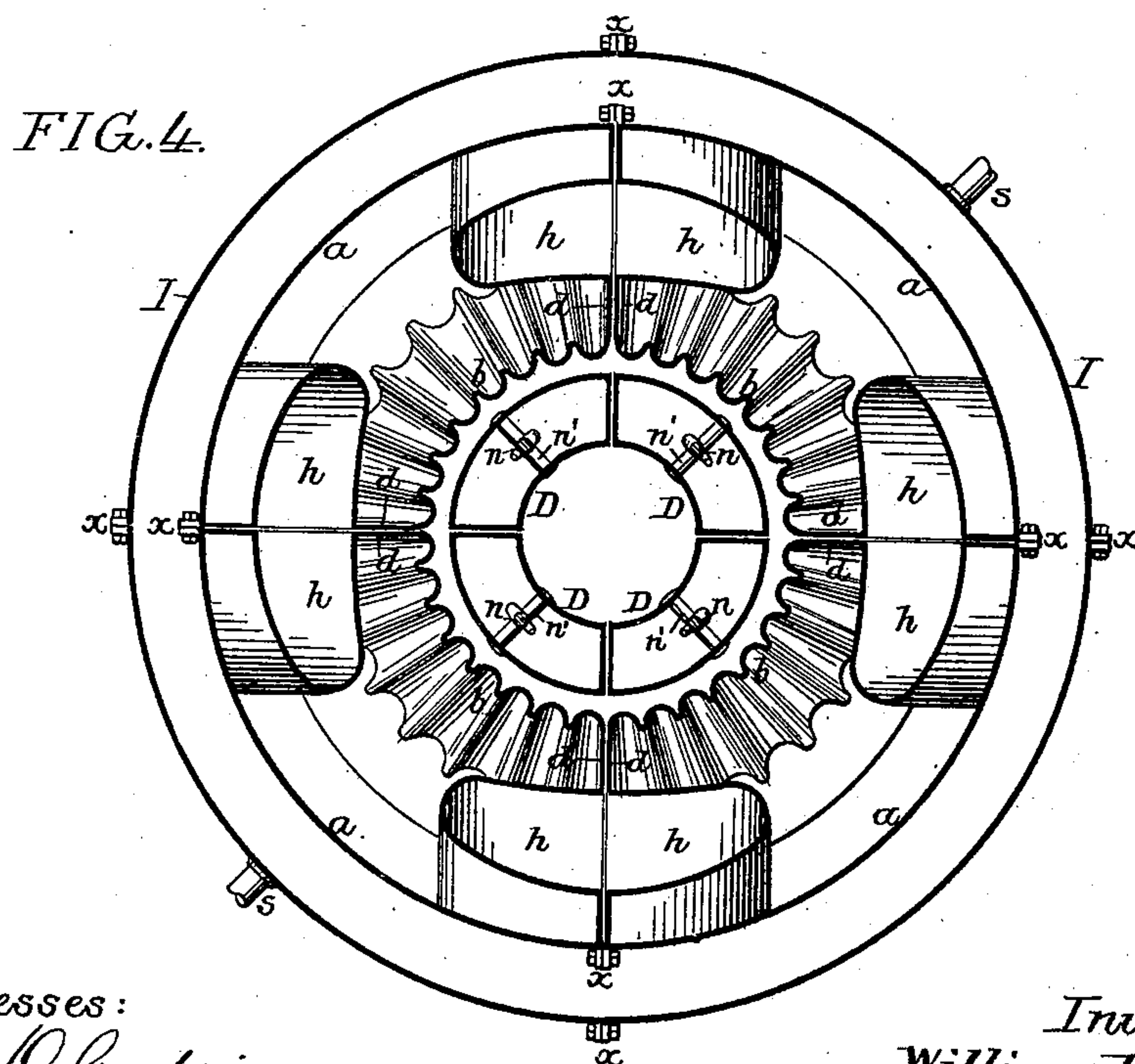
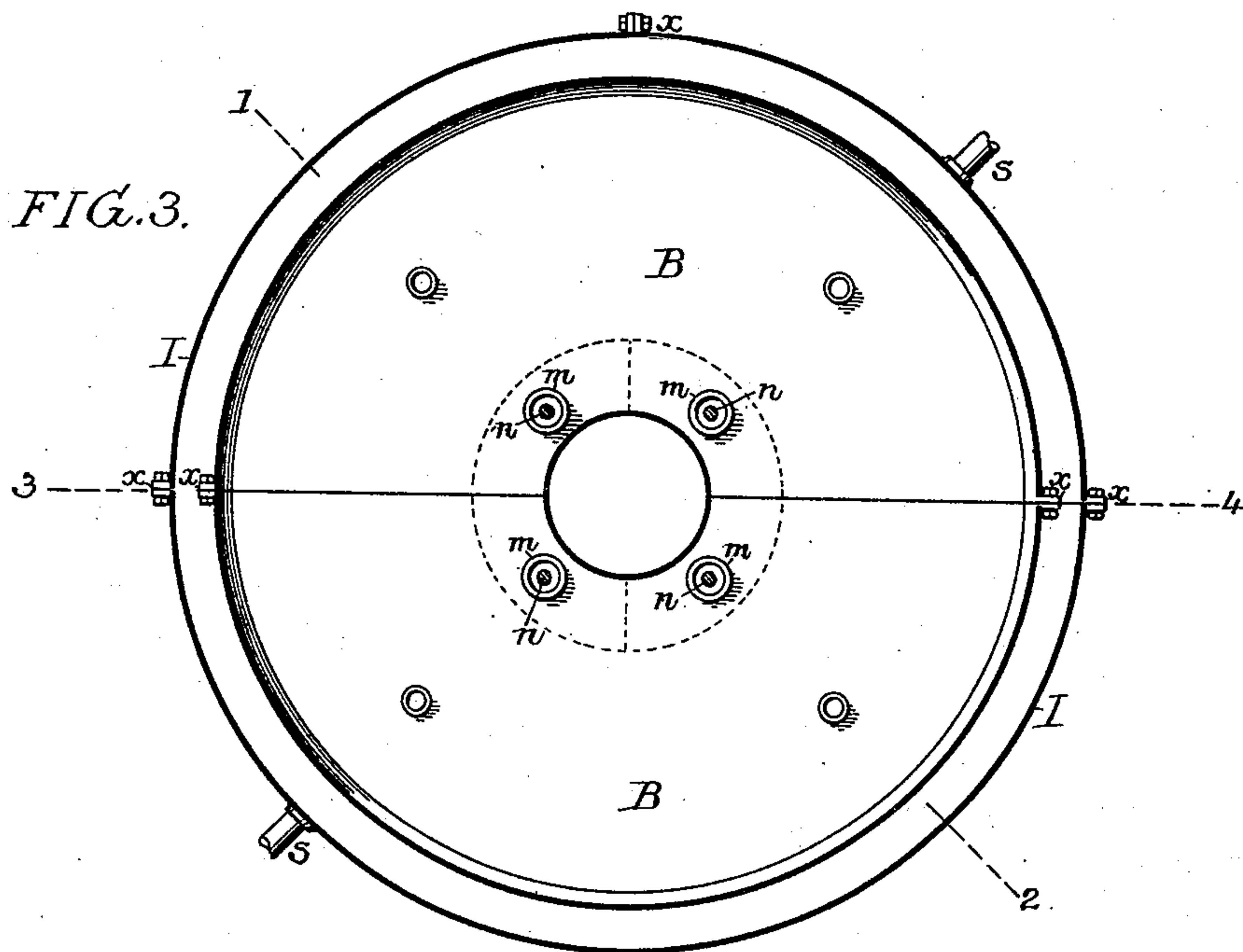
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(No Model.)

4 Sheets—Sheet 4.

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FIG. 5.

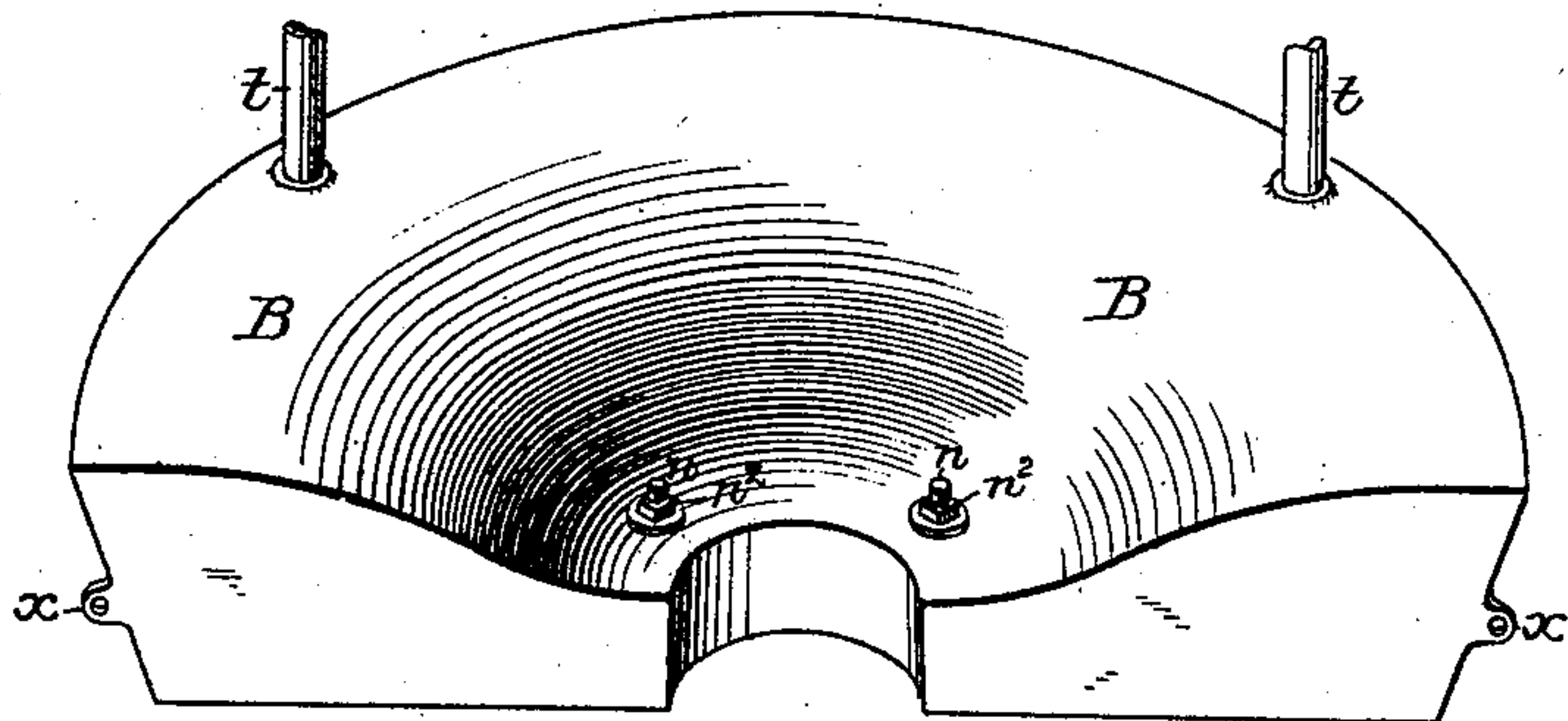


FIG. 6.

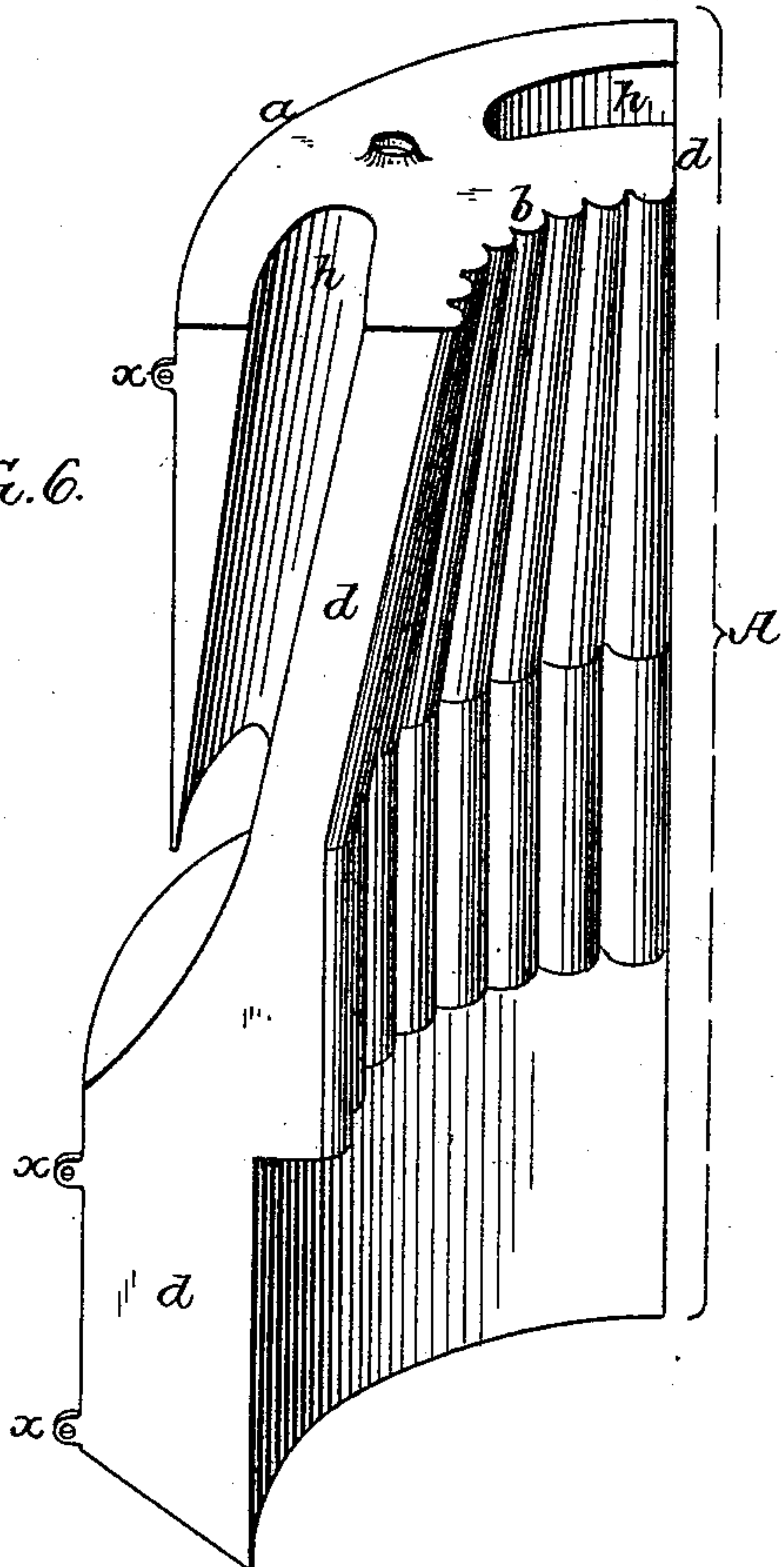
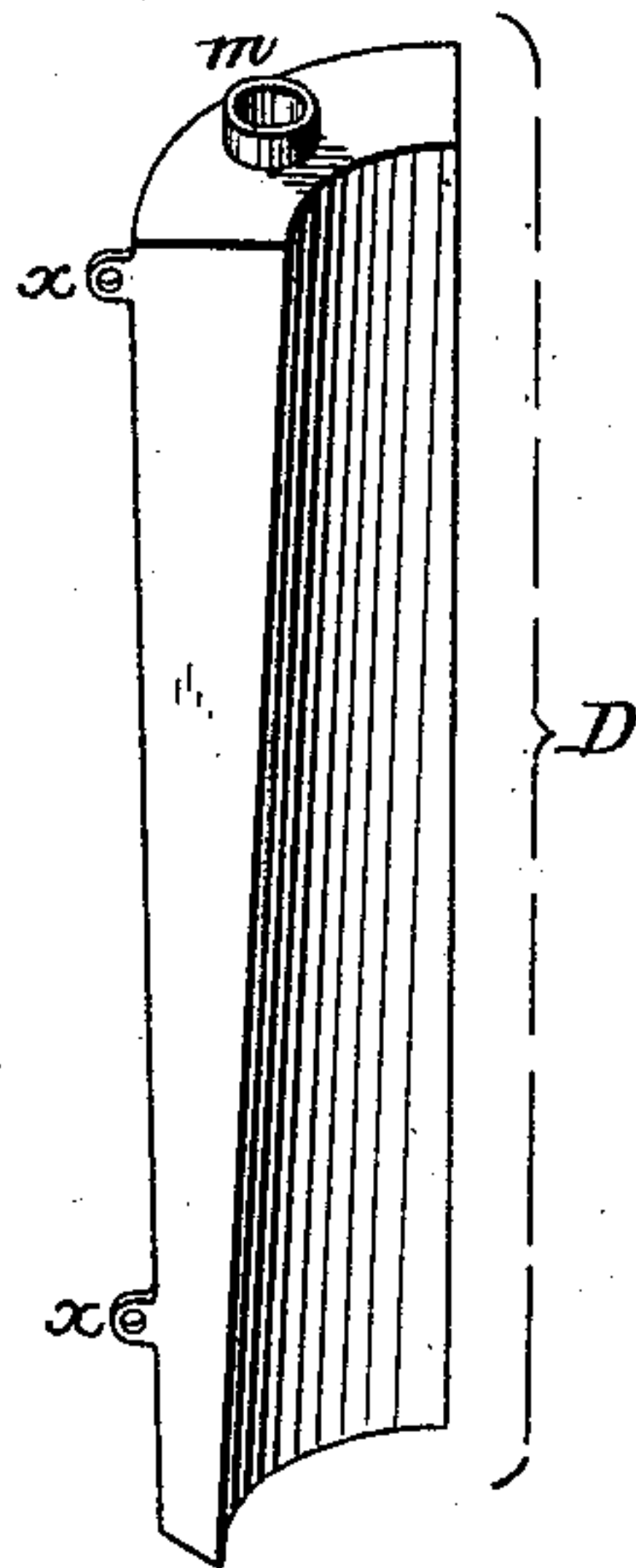


FIG. 7.



Witnesses:  
Fred D. Goodwin.  
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Inventor:  
William Burling  
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# UNITED STATES PATENT OFFICE.

WILLIAM BURLING, OF OXFORD, PENNSYLVANIA.

## STEAM-GENERATOR OR WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 465,239, dated December 15, 1891.

Application filed May 18, 1891. Serial No. 393,107. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM BURLING, a citizen of the United States, and a resident of Oxford, Chester county, Pennsylvania, have invented certain Improvements in Steam-Generators or Water-Heaters, of which the following is a specification.

My invention consists of certain improvements in that class of steam-generators or water-heaters which are used for house-heating purposes and are sometimes termed "house-boilers," one object of my invention being to provide for the ready repairing of different parts of the boiler independently of the other parts, or to render inoperative any desired section of the boiler without affecting the other sections, a further object being to increase the water capacity of the boiler and to maintain the water in substantially uniform volume in different parts of the boiler, and a still further object being to provide for the effective action of the products of combustion upon the heating-surfaces of the boiler. These objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section of a steam-generator or water-heater constructed in accordance with my invention, the section being taken on the line 1 2, Fig. 3. Fig. 2 is a vertical sectional view on the line 3 4, Fig. 3. Fig. 3 is a sectional plan view on the line 5 6, Fig. 1. Fig. 4 is a sectional plan view on the line 7 8, Fig. 2; and Figs. 5, 6, and 7 are detached perspective views of the various sections composing the boiler.

The boiler consists of three main parts, which may be denominated, respectively, the "body," the "dome," and the "magazine." The body consists of a number of sections A, there being in the present instance four of these sections, each consisting of a quadrant and having an outer wall *a*, inner wall *b*, and end walls *d*, and top and bottom *f* and *g*. These sections when fitted together inclose the combustion-chamber F and fire-pot G, the inner wall being by preference slightly deflected at the lower portion, so as to provide for the increased diameter of the fire-pot, as shown in Figs. 1 and 2. The inner wall of each section of the body is corrugated, so as to form

an increased heating-surface, and the upper portion of each of the inner walls of said body-sections is tapered inwardly so as to increase the capacity of each section in the upper portion thereof. This increase of capacity is provided for, because in each of the end walls of each section of the body of the boiler there is a recess *h*, these recesses, when the various sections of the body are fitted together, forming discharge-flues for the passage of the products of combustion, as described hereinafter. These flue-chambers therefore detract from the water capacity of those portions of the body-sections in which they are formed. Hence the thickening of the body-sections in the flue portions. The dome is likewise composed of sections B, of which in the present instance there are two, each of semicircular form, and these sections of the dome are mounted upon the body-sections A by means of right and left nipples *i*, adapted to suitable threaded openings formed in the bottom plates of the dome-section and in the top plates of the body-sections, as shown in Fig. 1.

The magazine is composed of a series of sections D, of which there are four in the present instance, each section comprising inner and outer walls, end walls, top and bottom, and the top plate of each section having a projecting nozzle *m*, which enters an opening in the bottom plate of the dome-section, suitable packing being interposed to make a fire-proof and water-tight joint.

Each magazine-section is suspended from the dome-section by means of a bolt *n*, the lower end of which engages with a transverse rod *n'* in the magazine-section, the upper end passing through an opening in the top plate of the dome-section and being threaded for the reception of a nut bearing upon said top plate, as shown in Fig. 1.

Between the bottom plate of the dome and the upper plates of the body-sections of the boiler is interposed a ring *p*, (preferably made in sections,) which is located beyond the flue-spaces *h*, and surrounding the dome and body of the boiler is an outer casing I, also sectional, so that the products of combustion rising from the fire-pot pass up through the combustion-chamber F in contact with the corrugated inner walls of the body-sections



of the boiler and with the outer walls of the magazine-sections, the products of combustion then impinging upon the top plates of the body-sections and the bottom plates of the dome-sections, and then, owing to the check-ring  $p$ , descending the flue-spaces  $h$ , and finally escaping laterally therefrom and circulating in the chamber between the outer walls of the body-sections and the outer casing before escaping from the latter through a suitable pipe leading to the chimney, any desired arrangement of baffle-plates being located in this chamber for the purpose of causing the products of combustion to take a circuitous course through the same.

The sections of the body, dome, check-ring, magazine, and outer casing are provided with perforated lugs  $x$  for the reception of suitable bolts for securing said sections together.

The feed-water or return pipes  $s$  communicate with the lower portion of the body-sections of the boiler and the steam or hot water discharge-pipes  $t$  lead from the sections of the dome, as shown in Fig. 1.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The body of the boiler, composed of a number of sections, each complete in itself, and having flue-spaces in the ends extending to the outside of the section some distance above the bottom of the same, each section being expanded laterally in those portions in which the flue-spaces are formed, so as to maintain substantially equal volume of water throughout the section, substantially as specified.

2. The combination of the body of the boiler,

composed of a number of sections, each complete in itself, with flue-spaces extending from the top of each section to the outer side of the same some distance above the bottom, substantially as specified.

3. The combination of the dome of the boiler with the magazine independent of the body and composed of a number of segmental water-chambered sections communicating at their upper ends with the interior of the dome, substantially as specified.

4. The combination of the body of the boiler, the dome, and the magazine, each composed of sections complete in itself, and said body-sections having flue-spaces, with connections between said body-sections and magazine-sections and the dome-sections, substantially as specified.

5. The combination of the dome, the magazine-sections having transverse bars, suspension-bolts engaging with said bars and passing through the dome, and nozzles through which the magazine-sections communicate with the dome, substantially as specified.

6. The combination of the body-sections having side-delivery flue-spaces, the dome, the outer casing, and the check-ring interposed between the body-sections and the dome outside of the flue-spaces, substantially as specified.

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

WILLIAM BURLING.

Witnesses:

EUGENE ELTERICH,  
HARRY SMITH.