

No. 617,393.

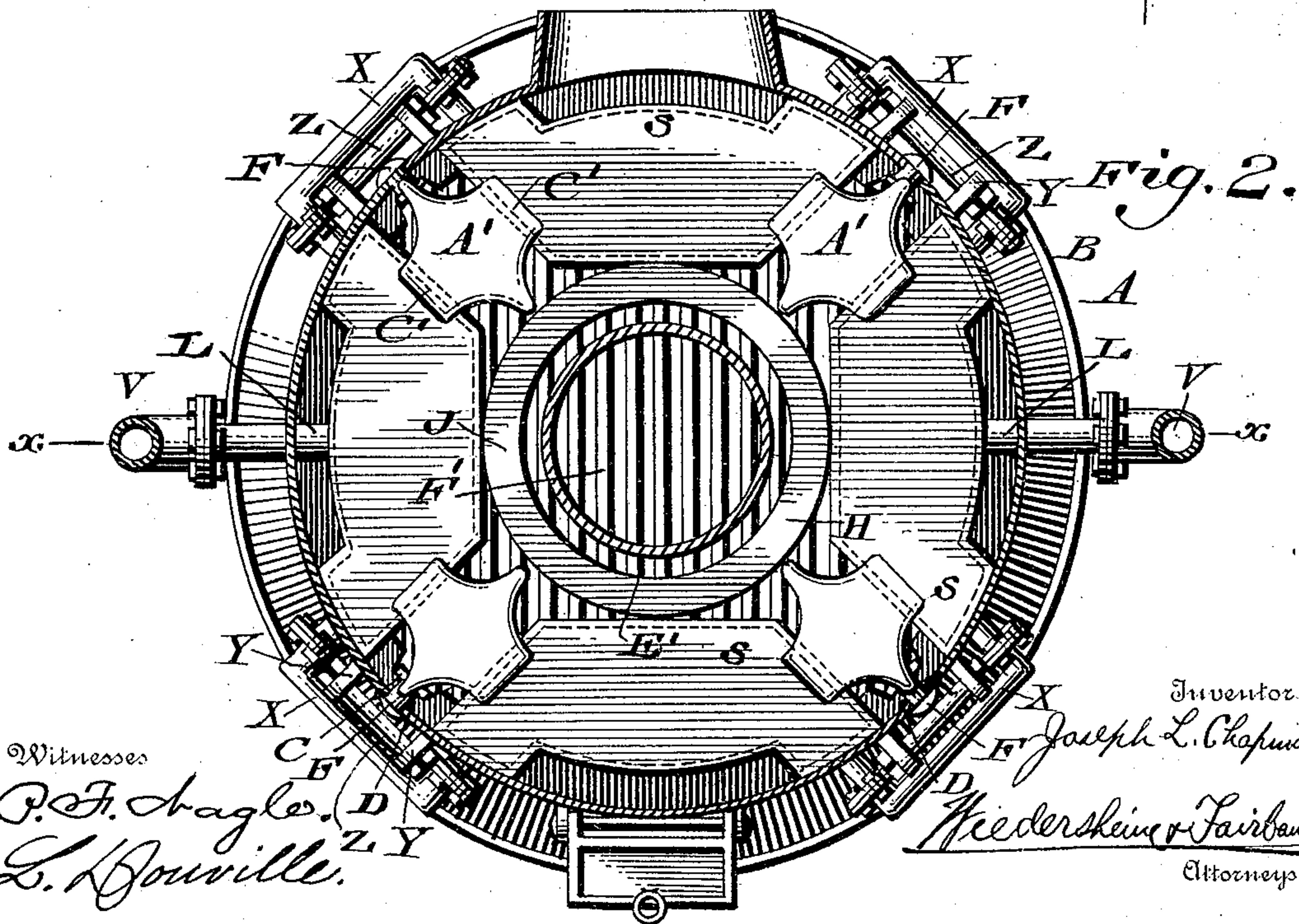
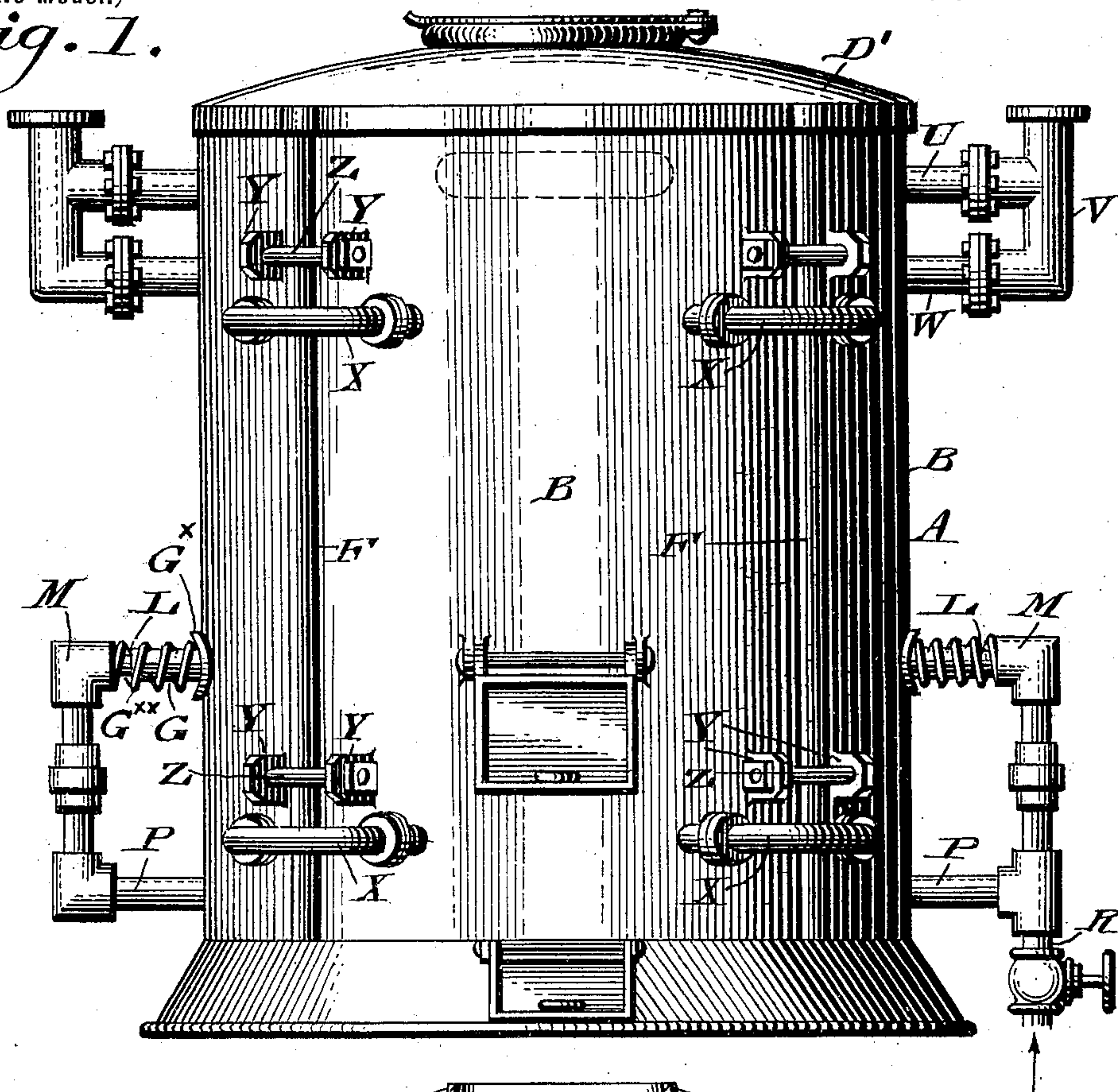
Patented Jan. 10, 1899.

J. L. CHAPMAN.
STEAM OR HOT WATER GENERATOR.

(Application filed Sept. 28, 1898.)

2 Sheets—Sheet 1.

(No Model.)
Fig. 1.



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2 Sheets—Sheet 2.

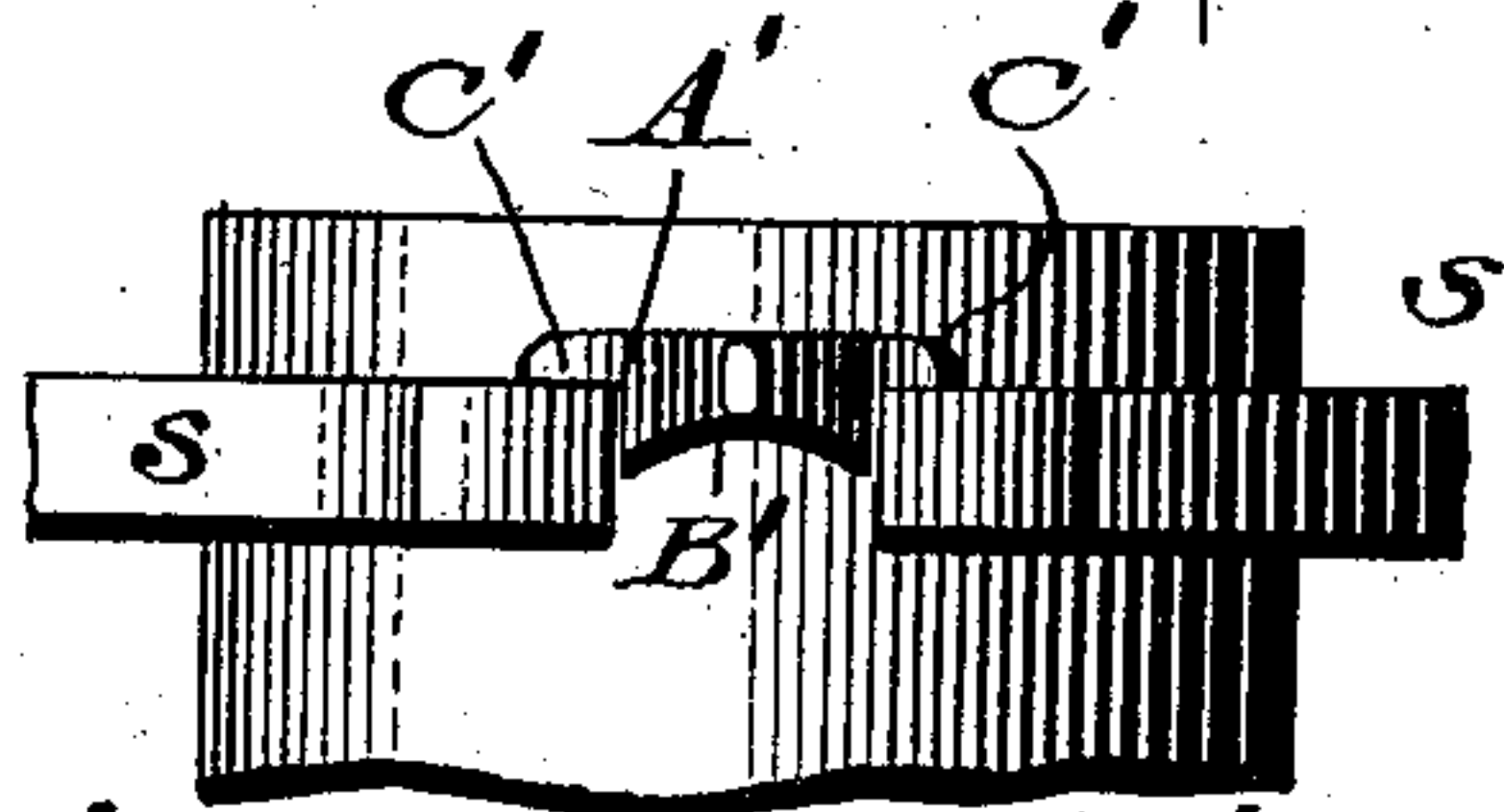
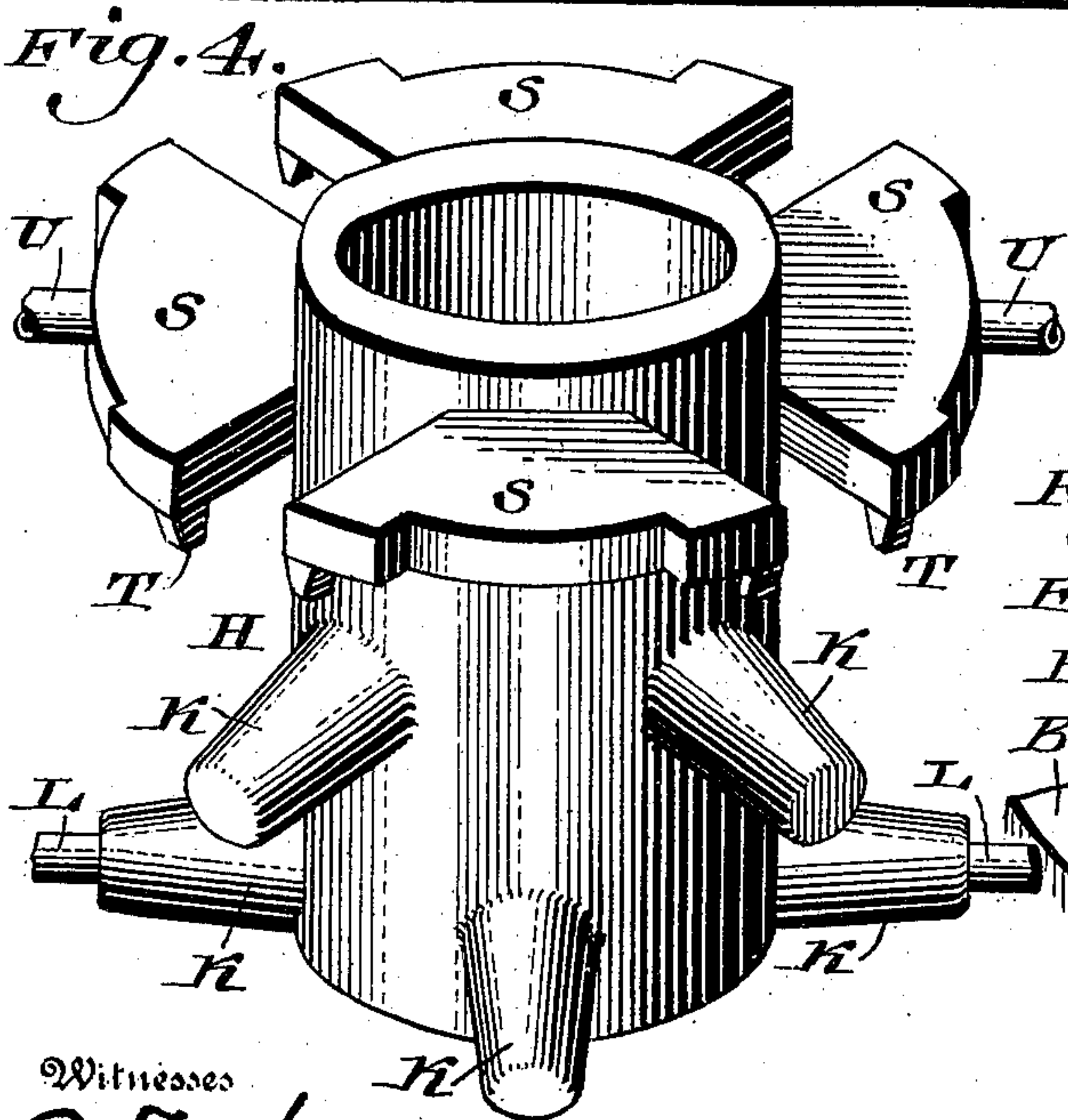
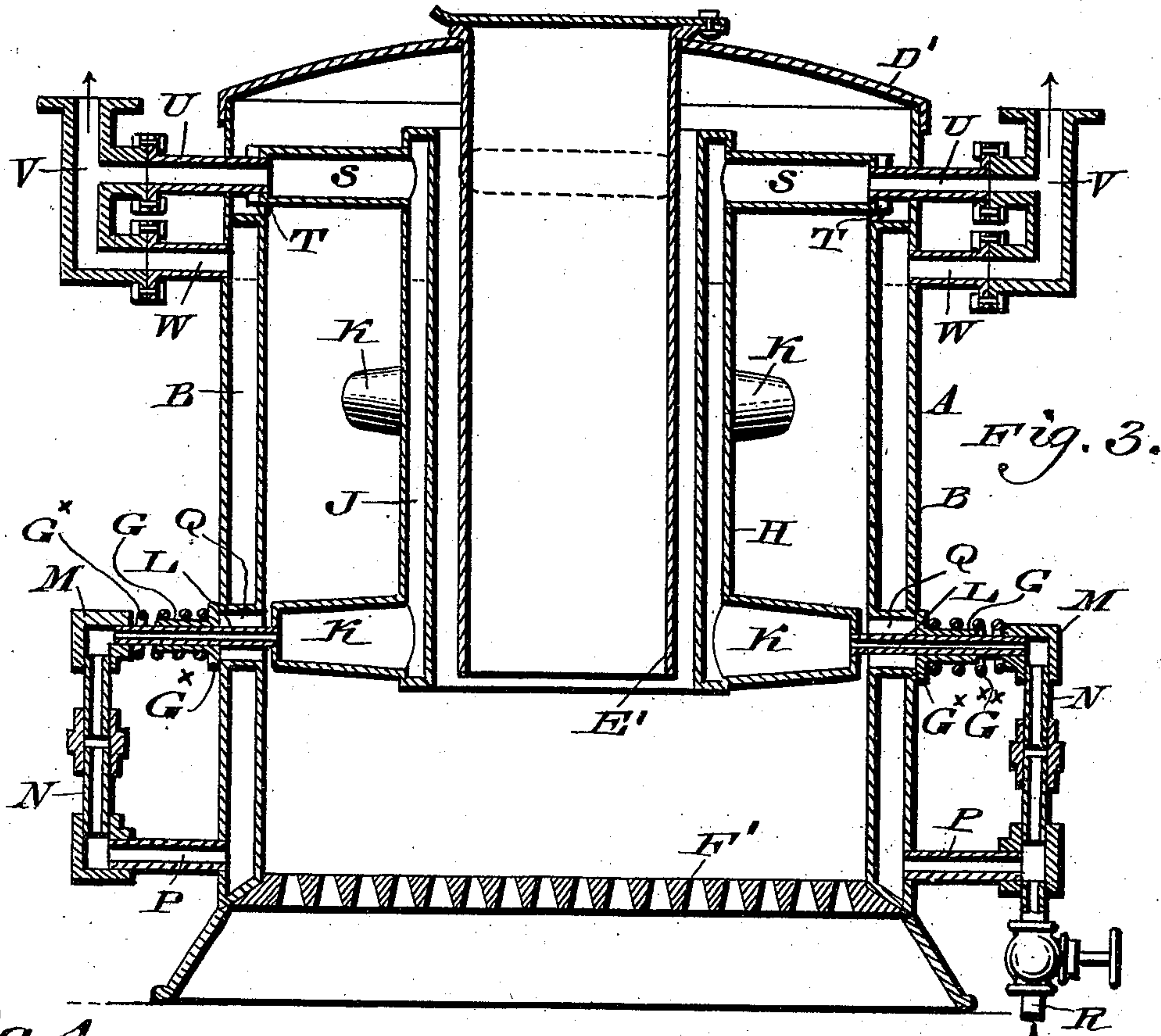
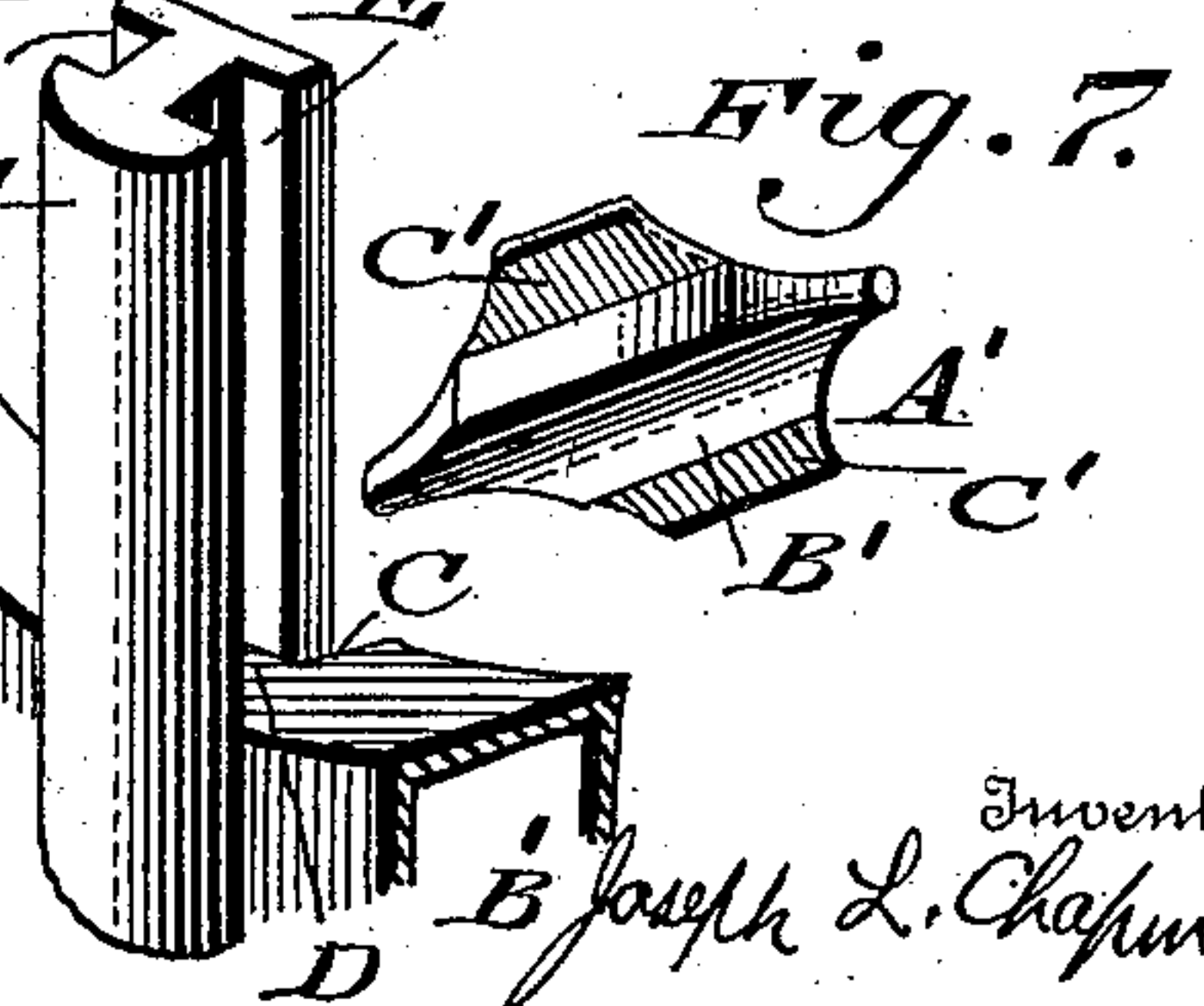


Fig. 6.

Fig. 7.



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UNITED STATES PATENT OFFICE.

JOSEPH L. CHAPMAN, OF HADDONFIELD, NEW JERSEY, ASSIGNOR TO
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STEAM OR HOT-WATER GENERATOR.

SPECIFICATION forming part of Letters Patent No. 617,393, dated January 10, 1899.

Application filed September 28, 1898. Serial No. 692,047. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH L. CHAPMAN, a citizen of the United States, residing at Haddonfield, in the county of Camden, State of New Jersey, have invented a new and useful Improvement in Steam or Hot-Water Generators, which improvement is fully set forth in the following specification and accompanying drawings.

10 My invention consists of an improved construction of steam and hot-water generator in which provision is made for rapidly and effectively raising the temperature of the steam or hot water to a high degree and utilizing the heat units of the products of combustion.

15 It also consists in the employment of an outer water-jacket constructed in segmental sections and of a novel construction of key or locking device common to a pair of said sections.

20 It also consists of an improved construction of internal water-chamber and of novel means for making the connection therefrom to the outer sections of the water-jacket.

25 It also consists of a novel construction of heat-deflectors and wings upon which said deflectors are supported, said wings extending radially from an internal water-holding chamber.

30 It also consists of novel means for closing under all conditions the opening in the water-jacket sections through which pipes pass common to said sections and an internal chamber.

35 It further consists of novel details of construction, all as will be hereinafter fully set forth, and particularly pointed out in the claims.

40 Figure 1 represents a side elevation of a steam and hot-water generator embodying my invention. Fig. 2 represents a top plan view of the interior of the generator, the top portion of the latter being removed. Fig. 3 represents a vertical sectional view of the generator, the section being taken on line *x x*, Fig. 2. Fig. 4 represents, on an enlarged scale, a perspective view of an internal water-holding chamber, the same being shown in detached position. Fig. 5 represents a side elevation of the upper portion of the water-holding chamber showing, one of the heat-de-

flectors placed in position. Fig. 6 represents a perspective view of a pair of adjacent sections of the boiler, showing also the upright key or means for locking the sections in assembled position. Fig. 7 represents a perspective view of a device employed for deflecting or retarding the flow of products of combustion, the same being shown in detached position.

Similar letters of reference indicate corresponding parts in the figures.

Referring to the drawings, A designates a sectional boiler, the same being composed of a plurality of sections B, the same being in the present instance of segmental shape and four in number, although it is of course evident that the number thereof may be increased or diminished according to requirements. Each of the sections is made hollow, as will be understood from Figs. 3 and 6, the same when assembled forming a cylindrical or similarly-shaped water-jacket, as will be apparent from Fig. 2.

The manner of holding or locking the sections in assembled position will be best understood from Figs. 2 and 6, each section being provided with an inner recessed portion C, whereby the tongues D are formed, which engage the grooved or channeled portions E of the upright key or locking device F, as will be understood from Figs. 2 and 6, it being apparent that the sections are assembled by being placed in upright position and in proximity to each other, after which the locking device or key F is inserted in the manner indicated in Fig. 6 and forced downwardly, whereby it will be apparent that the sections will be rigidly held in assembled position.

H designates an internal water-heating chamber, the same consisting of a cylindrical or other shaped body J, which has the arms K projecting therefrom, the lower opposite pair of said arms having pipes L projecting therefrom into the elbows M, from which the pipes N lead downwardly into the branches P, which communicate with one of the outer sections of the water-jacket, the latter having openings Q therein, through which said pipes L pass.

In order to provide for expansion and con-

traction and to keep the openings Q closed, I employ a sleeve G, through which passes the pipe L, said sleeve having a flange G^x, which closes said opening.

5 G^{xx} designates a spring having one end bearing on said flanges, while its other end bears against the elbow M.

R designates an inlet-pipe which communicates with one of the branches P, whereby
10 the water is initially fed to the heater, it being noted that the water is simultaneously fed to one of the arms K and also to the lower portion of one of the water-holding sections B, whereby an effective circulation is at once
15 attained, as is evident.

S designates a series of flattened, radially-extending, wedged, or similar shaped wings which extend from the upper portion of the internal chamber H and are provided with
20 depending lugs T, which rest upon the upper portion of the water-jacket sections B, whereby said chamber is supported and a free passage is afforded for the products of combustion around said wings, as will be evident.

25 U designates pipes which lead in the present instance from an opposite pair of the wings S into a coupling V, the upper portion of which is preferably flanged, whereby connection can be made to the points to which
30 it is desired to conduct the steam or hot water, said passage V also communicating by means of the pipe W with the upper portion of the adjacent water-jacket section B.

Provision is made for insuring proper circulation between the water-jacket sections
35 by means of the exterior circulating-pipes X, and additional means are also provided for enabling the sections to be securely held in assembled position by means of the oppositely-located sets of lugs Y and the bolts or
40 similar devices Z, which are common thereto.

It will be noted that a space exists between the adjacent upper water-holding wings S, and in order that the products of combustion may
45 not pass too freely therebetween I support thereon a heat deflecting or retarding device A', the general construction of which will be apparent from Figs. 2, 5, and 7, the same consisting of a body portion B', having the lips
50 or lugs C', whereby they are supported upon the water-containing wings S, as will be evident from Fig. 5.

D' designates the top of the boiler, which is supported in any suitable manner and may
55 be provided with an outlet or flue, as is customary, for the passage of the products of combustion.

E' designates a magazine which is in the present instance supported upon the top D' and depends to a point near the termination
60 of the chamber J above the grate F'.

It will of course be understood that the boiler is provided with the usual appurtenances, such as ash-pit, fire-doors, draft-regu-
65 lators, and all similar adjuncts.

The operation is as follows: The cold water enters the pipe R, which may be provided

with a valve, as is customary, and passes thence through the pipes P and L into the lower portion of the water-jacket sections and
70 into the arms K, respectively, whence it freely and effectively circulates throughout the boiler. The heated water or steam leaves the boiler through the pipes U and W and is conducted through the passages V to any desired
75 point, as is evident.

It will be seen that in a boiler constructed as above described an unimpeded circulation is at all times attained, since a suitable body of water is always contained in the chamber
80 J, which is directly above the fire and exposed to the hottest portion of the products of combustion, and the water in said chamber J being initially heated to a high degree will cause an effective circulation under all conditions,
85 as is evident.

By the provision of the wings S a too rapid egress of the products of combustion before the heat units are extracted therefrom is prevented, and by the employment of the arms
90 K in addition to said wings a maximum quantity of water is exposed to the effects of the products of combustion.

It will be apparent that, if desired, the hollow internal water-chamber H can be removed
95 after disconnecting the pipes and other adjuncts, whereby I can use the remaining portion of the generator as a stove, as is evident.

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

1. In a sectional boiler, an outer water-jacket, composed of a plurality of segmental water-holding sections, having tongues formed thereon, and keys, having grooves therein,
105 said grooves being adapted to be engaged by said tongues.

2. A sectional boiler composed of a series of upright sections, a plurality of locking devices for holding said sections in assembled
110 position, an internal water-containing chamber having wings extending from its upper portion, said wings being supported upon the top of said sections, connections from the lower portions of said internal chamber to
115 the lower portions of said sections, and an outlet common to the upper portions of said internal chamber and the upper portion of said sections.

3. In a sectional boiler, the combination of
120 a plurality of external water-jacket sections, means for holding the same in assembled position, an internal chamber having upper laterally-extending water-holding wings supported upon the top of said jacket-sections, a
125 plurality of radial arms extending from said internal chamber, a connection from a lower set of said radial arms to the lower portion of said jacket-sections, and a connection leading from the upper portion of said internal
130 chamber to a passage communicating with the upper portion of the water-jacket sections.

4. A boiler having a sectional water-jacket,

openings in the latter, an internal water-chamber supported upon said jacket, pipes leading from the lower portion of said chamber to the lower portion of said jacket, sleeves
 5 through which said pipes pass, a flange on each of said sleeves closing said openings, springs for holding said flanges in position, upper and lower external circulating-pipes, connecting said sections, and outlets, leading
 10 from the upper portions of said chamber and the water-jacket sections.

5. In a sectional boiler, an internal hollow water-holding chamber, having arms extending therefrom, a plurality of wedge-shaped
 15 hollow wings projecting laterally from the upper portion of said chamber, and means for heating and circulating water through said chamber.

6. In a sectional boiler, an outer water-jacket composed of a plurality of segmental water-sections having tongues formed thereon and upright keys having grooves therein, said grooves being adapted to be engaged by
 20 said tongues, in combination with an internal water-chamber, means for supporting the latter and means for effecting a circulation between the upper and lower portions of said
 25 internal chamber and said jacket.

7. In a sectional boiler, a hollow internal water-holding chamber, having a plurality of flattened wedge-shaped wings projecting from the upper portion thereof, said wings having
 30 spaces therebetween, heat-retarding devices supported upon said wings, a water-jacket composed of upright sections and a plurality

of upright keys or locking devices for said sections, in combination with connections common to the lower and upper portions respectively of said water-jacket and internal chamber.

8. In a sectional boiler, an outer water-jacket composed of a plurality of water-holding sections having tongues formed thereon, keys having grooves therein, said grooves being adapted to be engaged by said tongues,
 40 an internal water-chamber having wings projecting therefrom and suitably supported, said wings having a space therebetween and heat-retarding devices supported upon said wings.

9. In a sectional boiler, an outer water-jacket composed of a plurality of water-holding sections having tongues formed thereon, upright keys having grooves therein which
 50 are engaged by said tongues, an internal water-chamber having wings supported on said sections, water-holding arms projecting from said chamber, an inlet-pipe leading to the lower portion of said jacket and to one of
 55 said arms, a circulating-pipe leading from the lower portion of said chamber to the lower portion of said jacket, circulating-pipes for the sections composing said jacket and an outlet-pipe having connections common to
 60 the upper portions of said jacket and internal chamber.

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