

(No Model.)

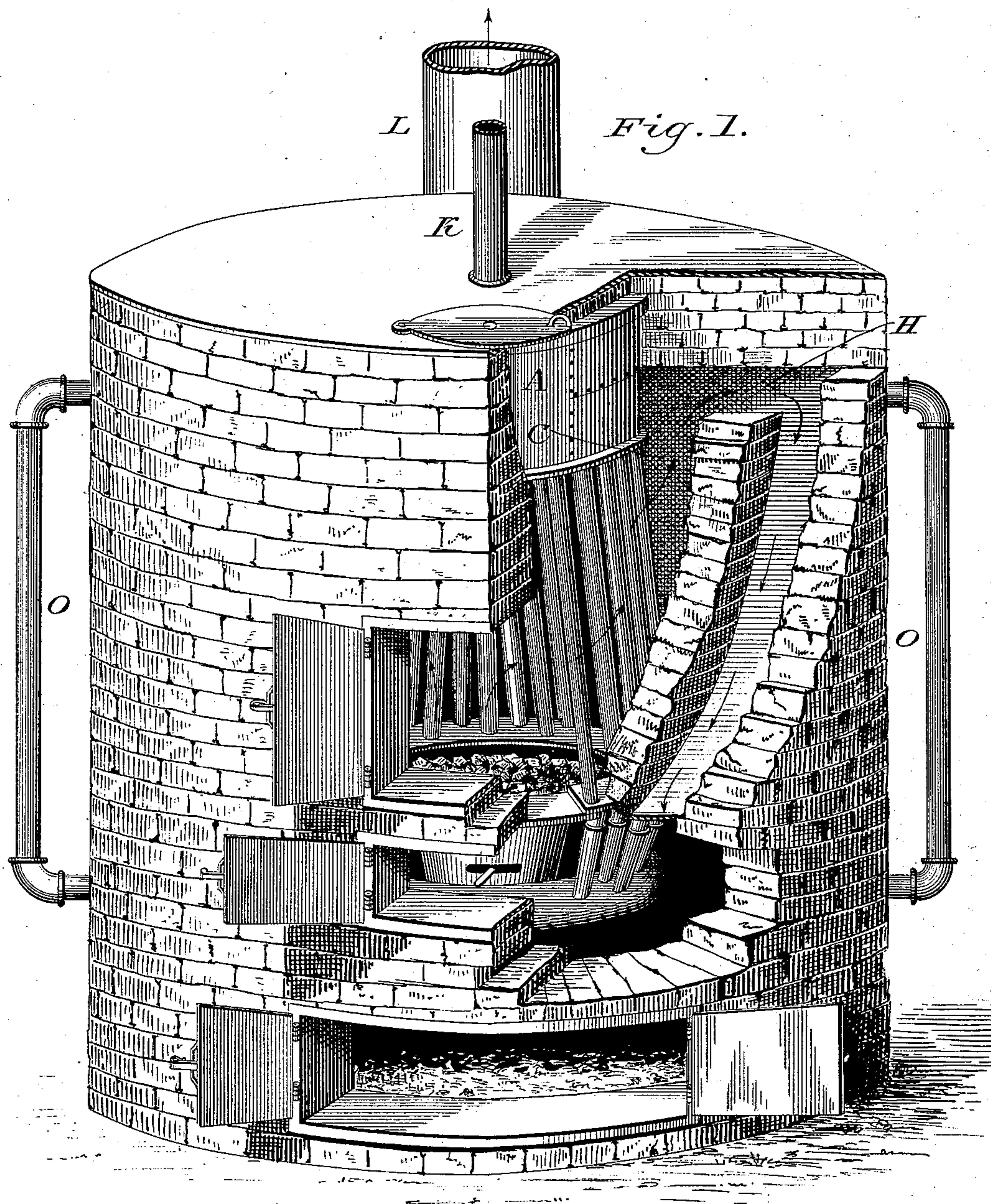
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G. H. ASIRE.

STEAM BOILER.

No. 289,796.

Patented Dec. 11, 1883.



Witnesses:  
John W. Anderson  
Paul Anderson.

Inventor:  
G. H. Asire



(No Model.)

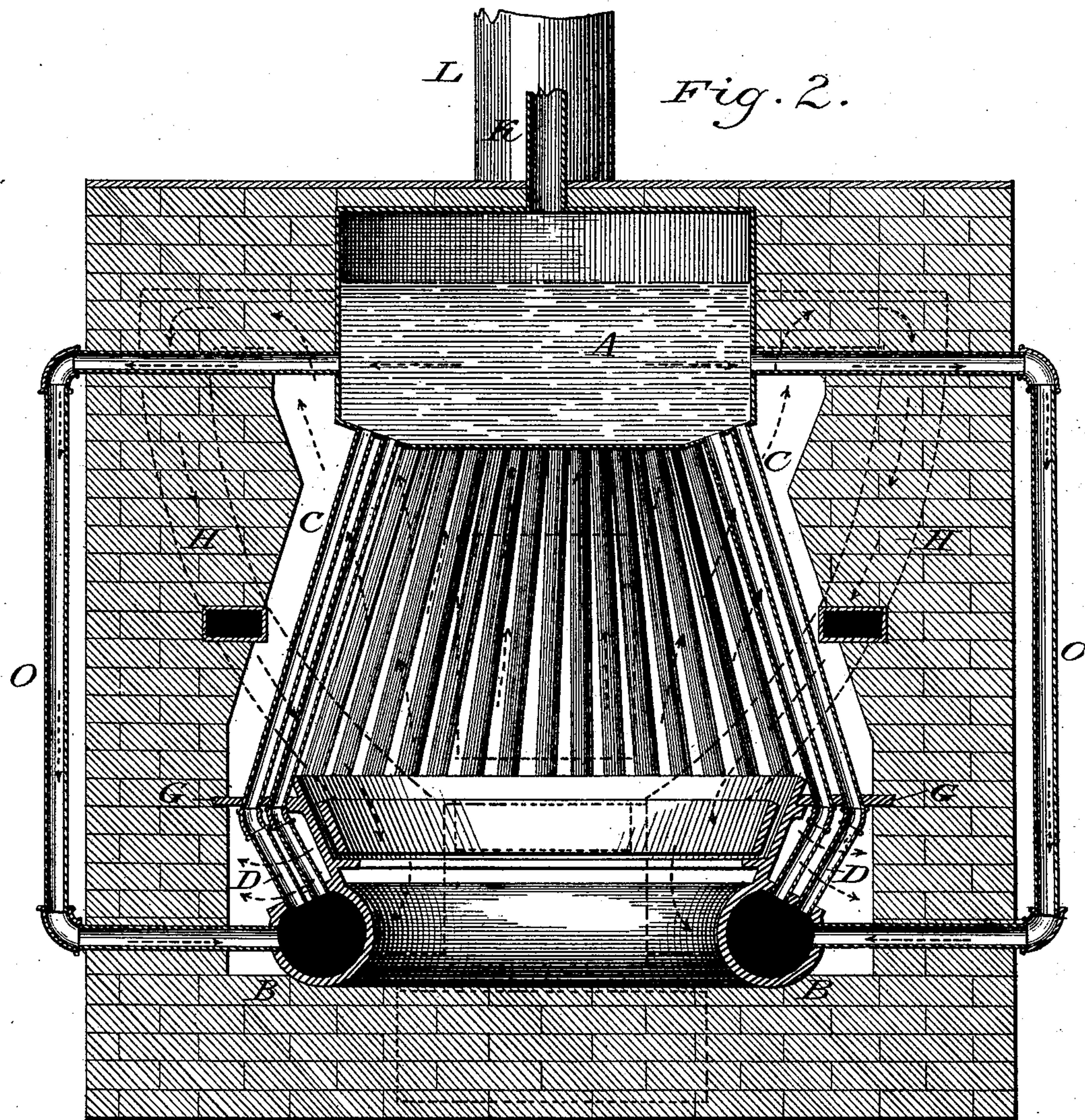
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Witnesses:

John W. Anderson  
Paul Anderson

Inventor:

Geo. H. Asire



(No Model.)

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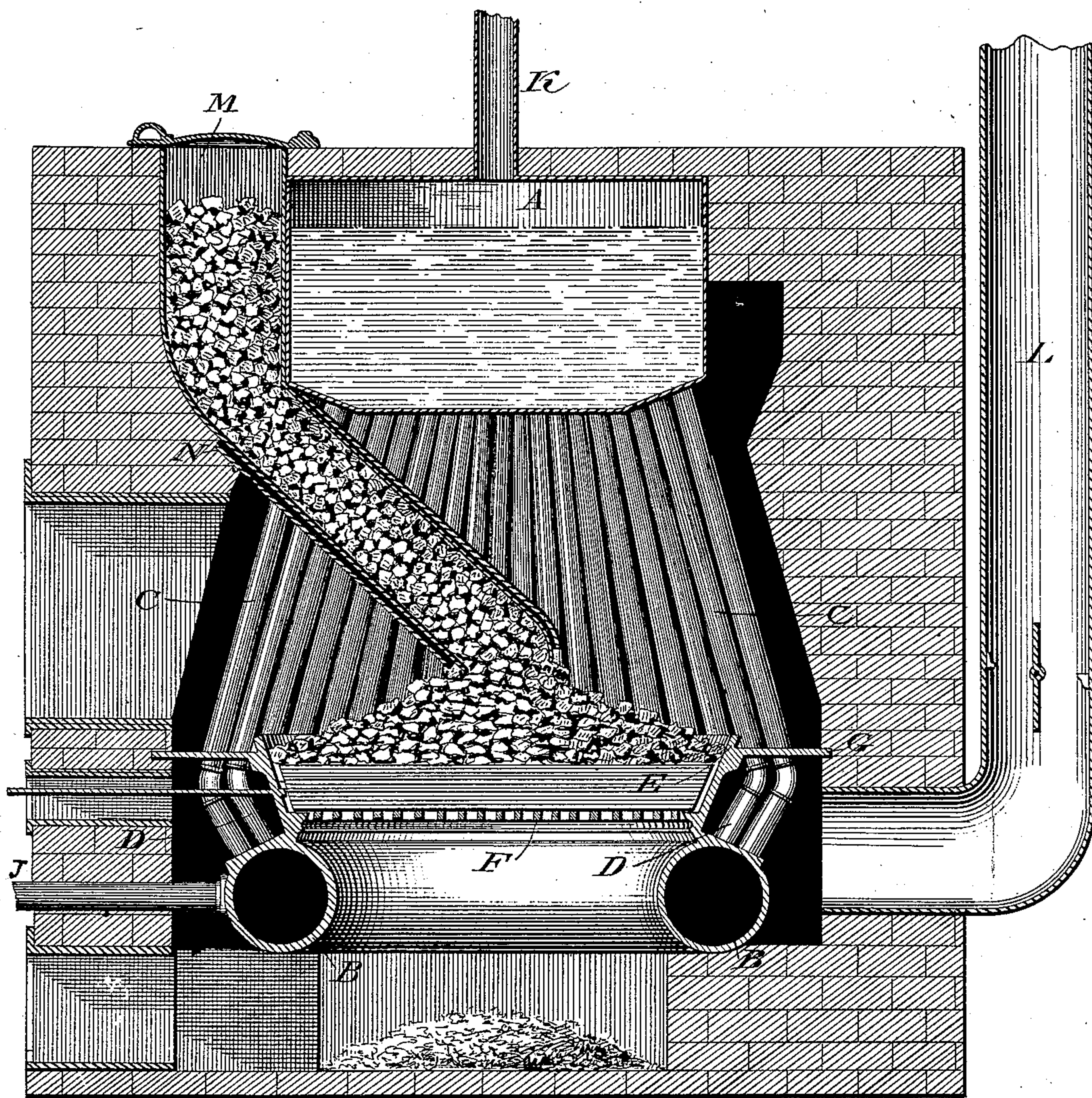
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*Fig. 3.*



*Witnesses:*

*John H. Anderson*  
*Paul Anderson.*

*Inventor:*

*G. H. Asire*



(No Model.)

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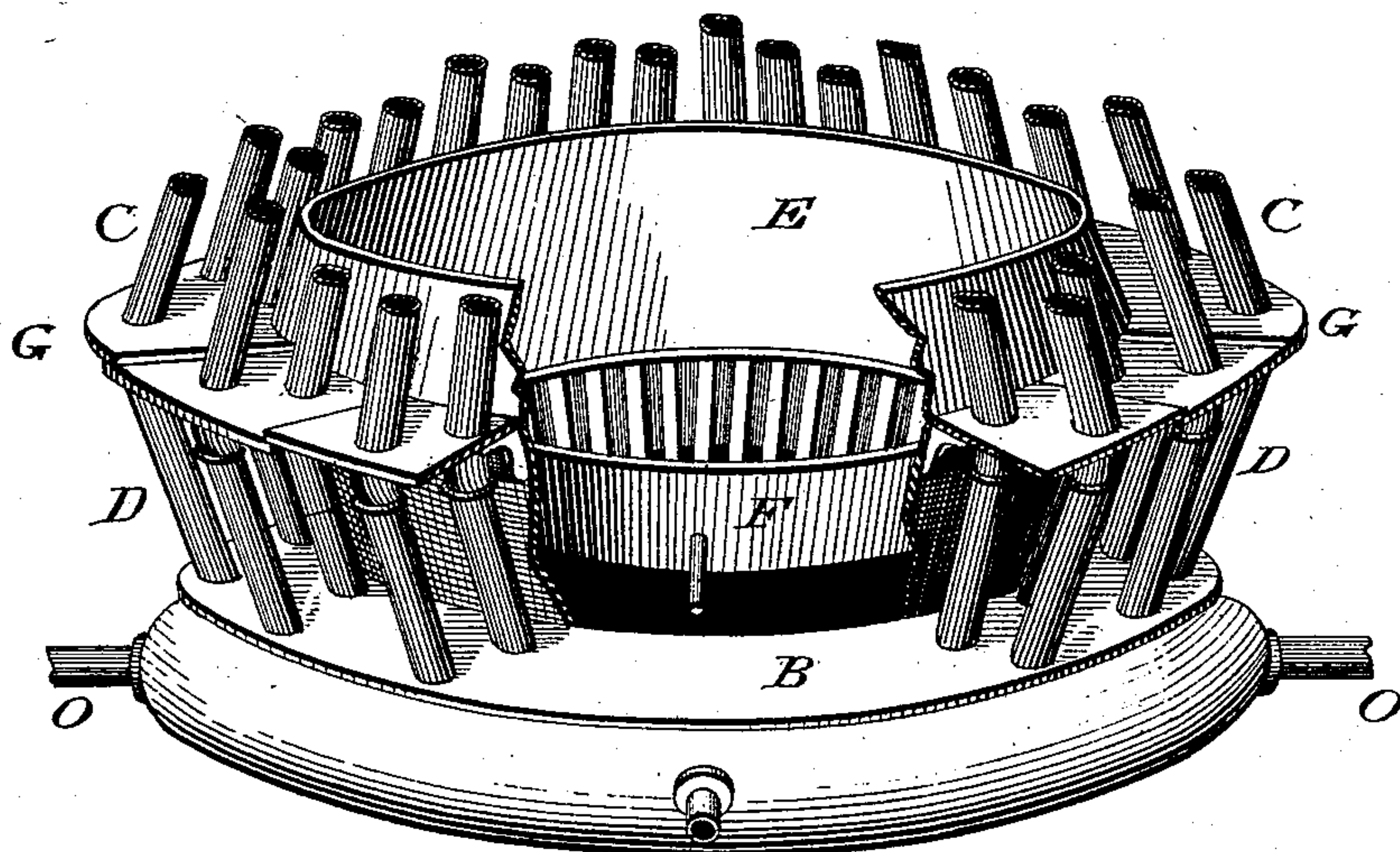
G. H. ASIRE.

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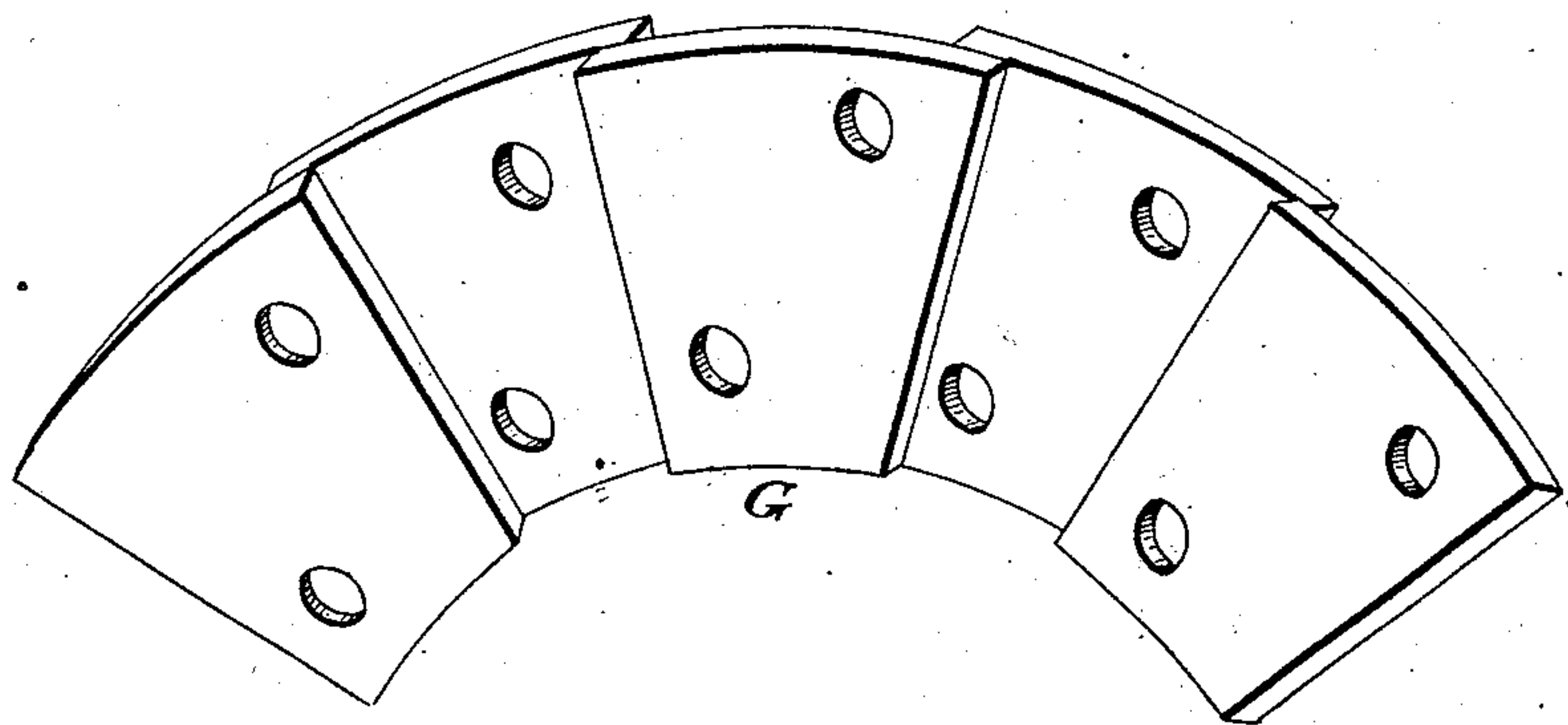
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*Fig. 4.*



*Fig. 5.*



*Witnesses:*

*John W. Anderson*  
*Paul Anderson,*

*Inventor:*

*Geo H Asire*



# UNITED STATES PATENT OFFICE.

GEORGE H. ASIRE, OF SOUTH BEND, INDIANA.

## STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 289,796, dated December 11, 1883.

Application filed April 26, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE H. ASIRE, a citizen of the United States, residing at South Bend, in the county of St. Joseph and State of Indiana, have invented new and useful Improvements in Steam-Boilers, of which the following is a specification.

My invention relates to the class of steam-boilers having upper and lower drums connected together by water-tubes; and the objects of my improvements are, first, to provide means for the expansion and contraction of the different parts without straining the joints; second, more rapid evaporation of water by increased heating-surface and quicker circulation; and, third, an improved device for conducting the fuel to the fire-grate. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation with a portion of the casing removed. Fig. 2 is a front vertical sectional view. Fig. 3 is a side vertical sectional view. Fig. 4 is a plan view of the lower part of the boiler. Fig. 5 is a detail view of flame-plates.

Similar letters indicate like parts in the several figures.

A is the steam-drum. B is the lower drum. C are the long water-tubes. D are the short water-tubes. E is the fire-pot. F is the grate. G are flame-plates to give direction to the draft. H H are diving-flues for conducting the heat downward under the flame-plates G. J is the pipe which supplies water to the boiler. K is the steam-pipe. L is the smoke-flue. M is the magazine for holding a supply of fuel. N is a chute for conducting the fuel to the grate. O O are circulating water-tubes between the upper and lower drums.

The upper drum, A, may be a plain circular reservoir adapted to hold water and steam, and provided with suitable holes in the lower sheet to receive the tubes C.

The lower drum, B, is annular in shape, and is provided with suitable holes to receive the tubes D. It is also provided with pipes for supplying the water and for blowing off.

The long water-tubes C and short water-tubes D form an angle at their junction, which allows them to expand and contract without kinking the tubes or straining the joints. I

prefer to join the tubes to the drums and to each other by screw-threads, and when constructed in this manner I construct the short tubes with right and left hand threads. Circulating-tubes O O, placed outside the combustion-chamber and connecting the upper and lower drums, assist in giving the water a rapid circulation.

The flame-plates G (shown in detail in Fig. 5) have holes of suitable size to fit loosely around the tubes C, and are located near the top of the fire-pot. The plates G cut off the chamber surrounding the lower tubes, D, from the chamber surrounding the upper tubes, C. The flame from the combustion-chamber circulates around the tubes C, then enters the flues H H, thence downward and under the plates G on each side of the front door, when it circulates around the tubes D and passes into the smoke-flue L at the rear side of the boiler.

The boiler may be constructed with one return-flue H; but I prefer two, as above described.

A fuel-magazine, M, is located on one side of the drum A.

A chute, N, conducts the fuel from the magazine to the grate. I prefer to place the chute N above the doors and in line with them, as by this means I utilize the same apertures between the tubes.

Though I have described the water-tubes C D as angular in shape, I wish it understood that my tubes are without branches and are continuous between the upper and lower drums, that the angle is simply a short bend near the lower ends, and I make no claim to tubes having a branch or branches diverging from them and forming an angle with them.

A damper, I, in the smoke-flue L is arranged to regulate the draft.

The door to the combustion-chamber, the ash-pit door, and the small door for shaking the grate are constructed in the usual form.

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

1. In a steam-boiler, the tubes C D, joined together at an angle and each constructed to form one continuous tube between the upper and lower drums, in combination with the annu-



lar lower drum, B, and steam-drum A, constructed and arranged substantially as and for the purposes described.

2. In a furnace, in combination with an annular drum, B, the flame-plates G and flue H, constructed and arranged substantially as shown and described.

3. In combination with the bent water-tubes C D, flame-plates G, and annular drum B, the inclined chute N, passing between the tubes C D, constructed and arranged substantially as shown and described, and for the purposes set forth.

4. In a steam-boiler, the angular bent tubes C D, in combination with the circulation-tubes O O, flame-plates G, and annular drum B, constructed substantially as and for the purposes set forth.

5. In combination with the annular drum and fire-pot E, the flame-plates G, constructed substantially as shown and described.

6. In a steam-boiler, the combination of the

flame-plates G, the downward draft-flues H, and inclined chute N, constructed and arranged substantially as and for the purposes described. 25

7. The combination of the tubes C and tubes D, the inclined chute N, annular drum B, and downward draft-flue H, constructed and arranged in relation to the furnace substantially as and for the purposes described. 30

8. The combination of the upper drum, A, lower annular drum, B, tubes C and D, and flame-plates G, substantially as shown and described.

9. The combination of upper drum, A, lower annular drum, B, tubes C and D, magazine M, inclined chute N, return-flue H, flame-plates G, and circulation-tubes O O, substantially as shown and described, and for the purposes set forth. 35

GEORGE H. ASIRE.

Witnesses:

WM. L. BUSH,

JOHN M. ANDERSON.