

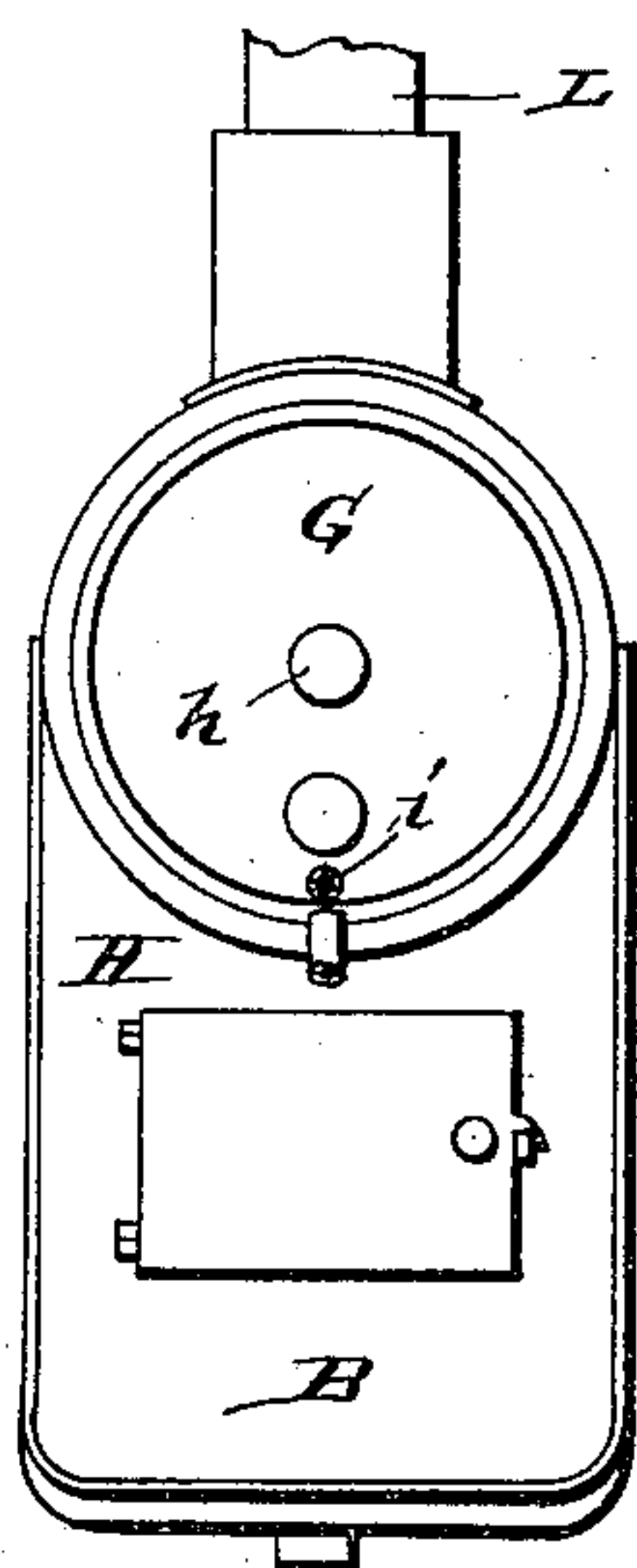
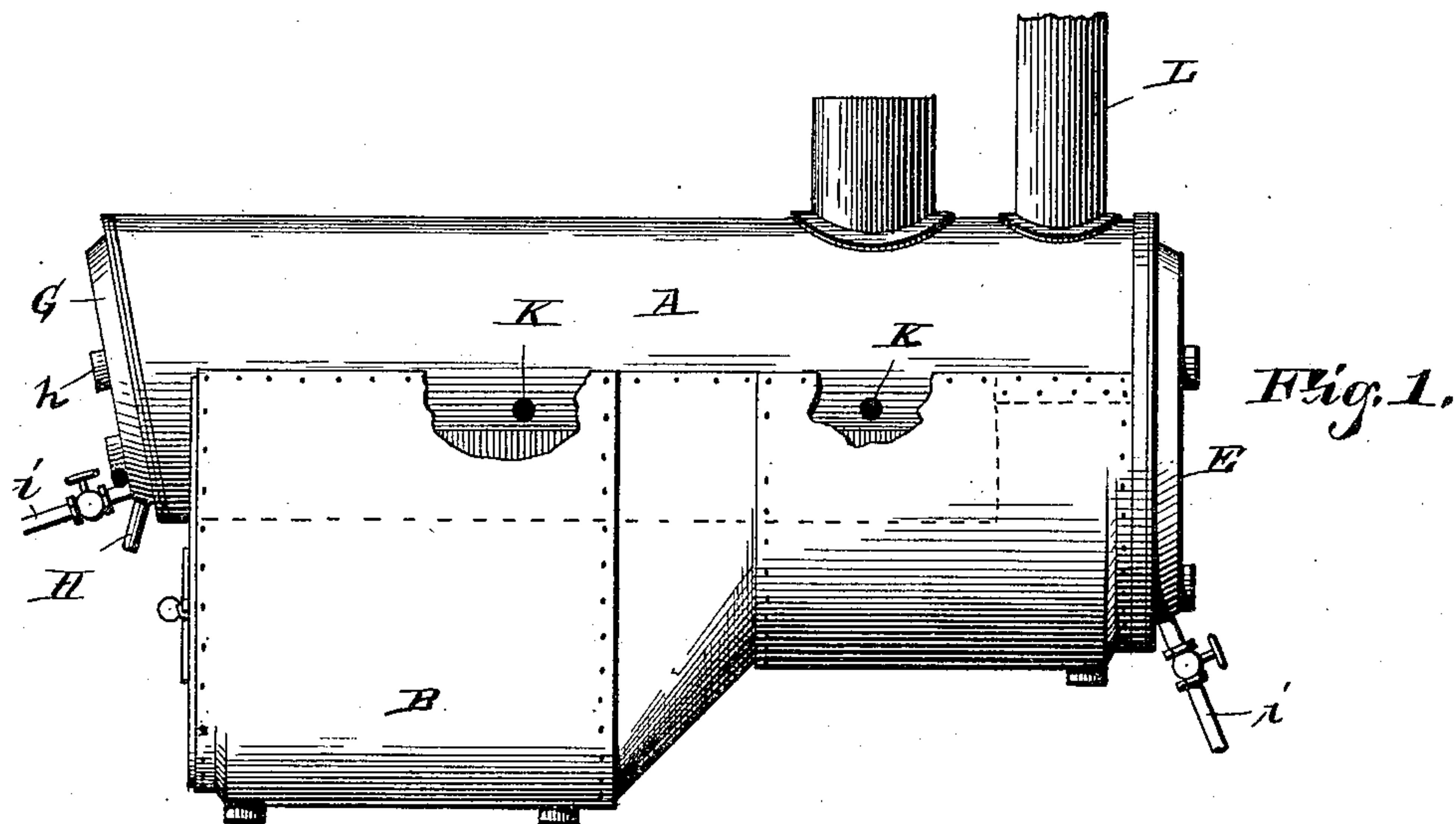
(No Model.)

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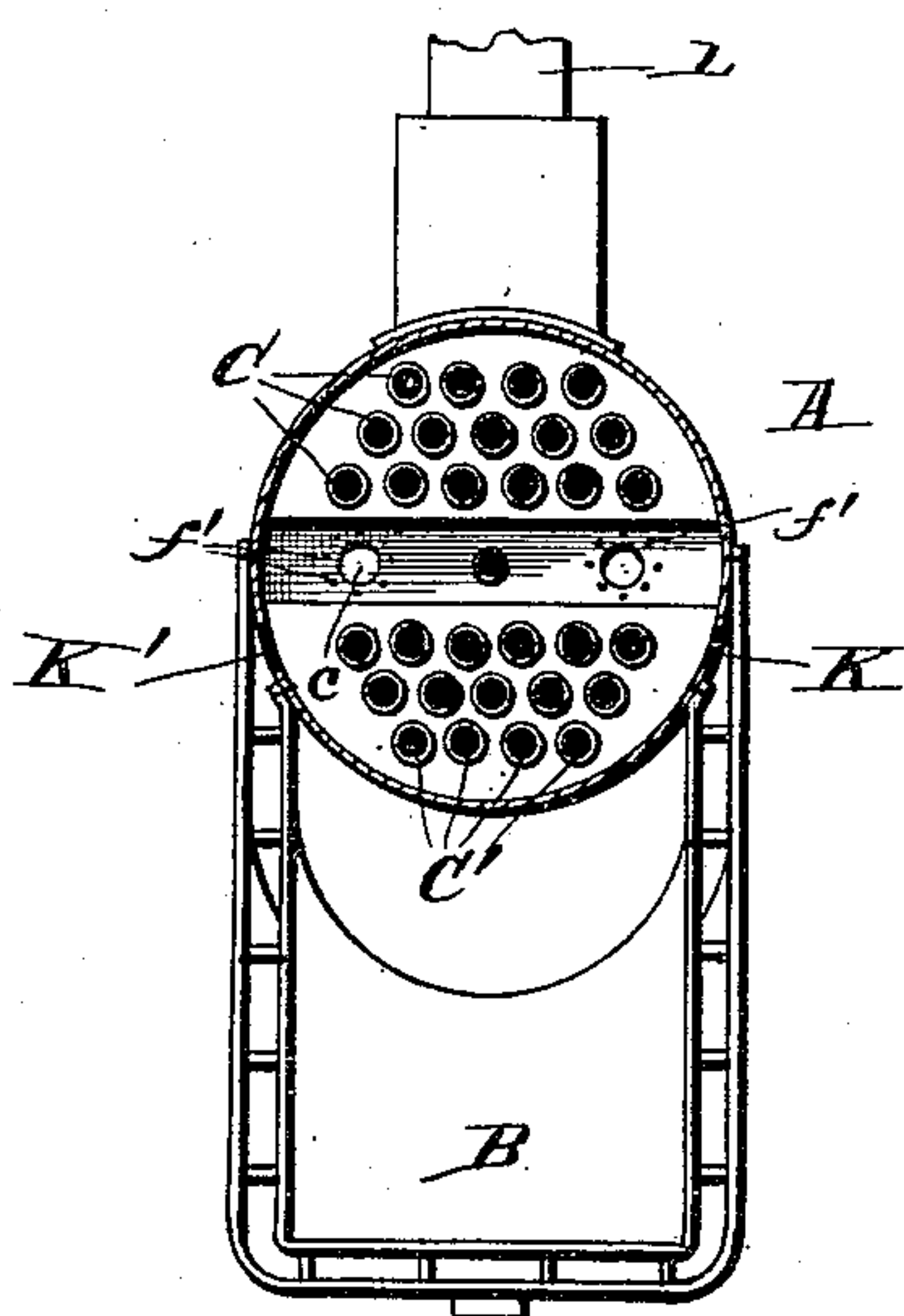
L. W. LESTER.  
STEAM BOILER.

No. 464,827.

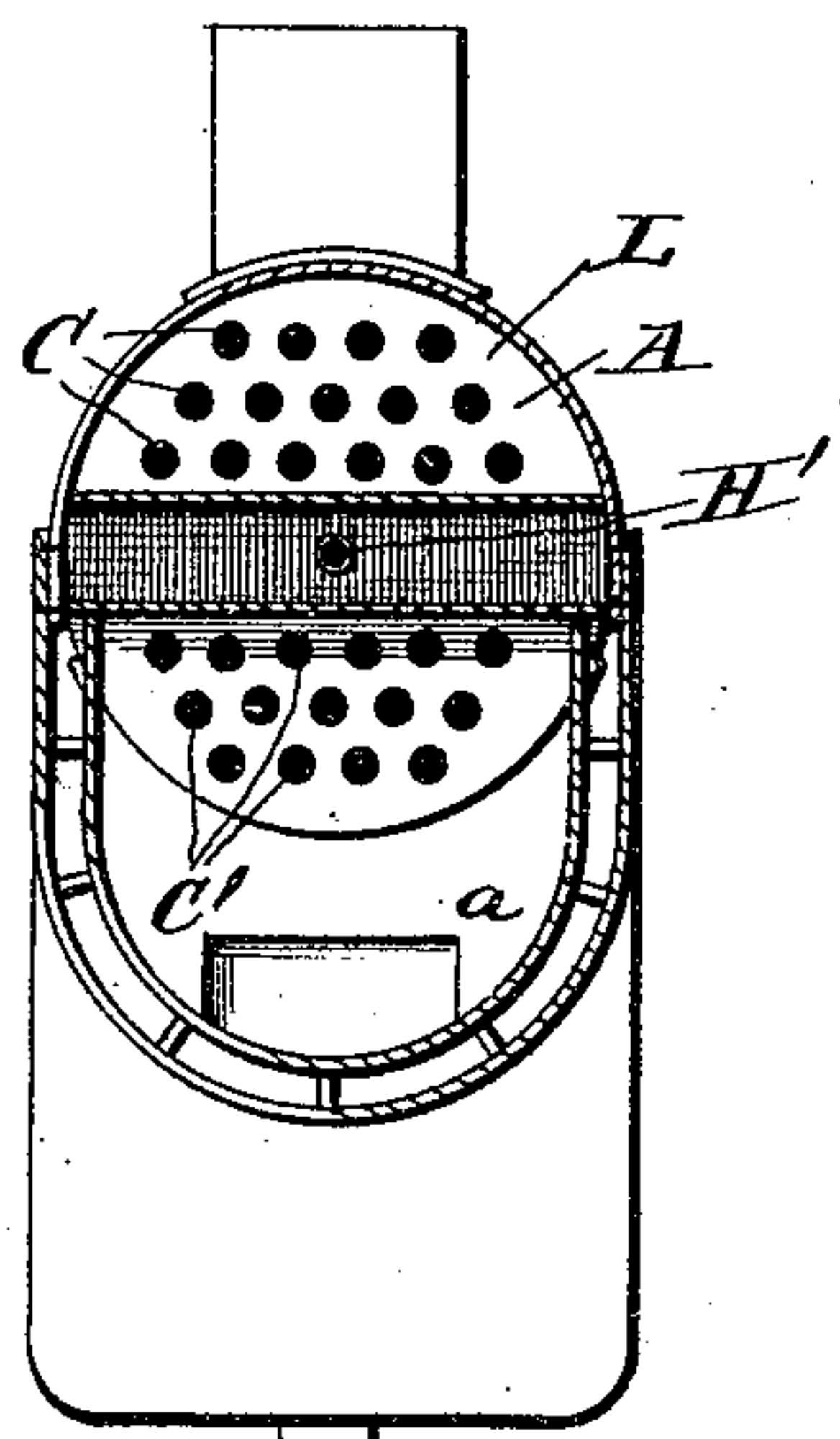
Patented Dec. 8, 1891.



*Fig. 3.*



*Fig. 4.*



*Fig. 5.*

*WITNESSES*

Samuel Ker.  
Phelps Masi

*INVENTOR*

Lewis W. Lester  
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his Attorney

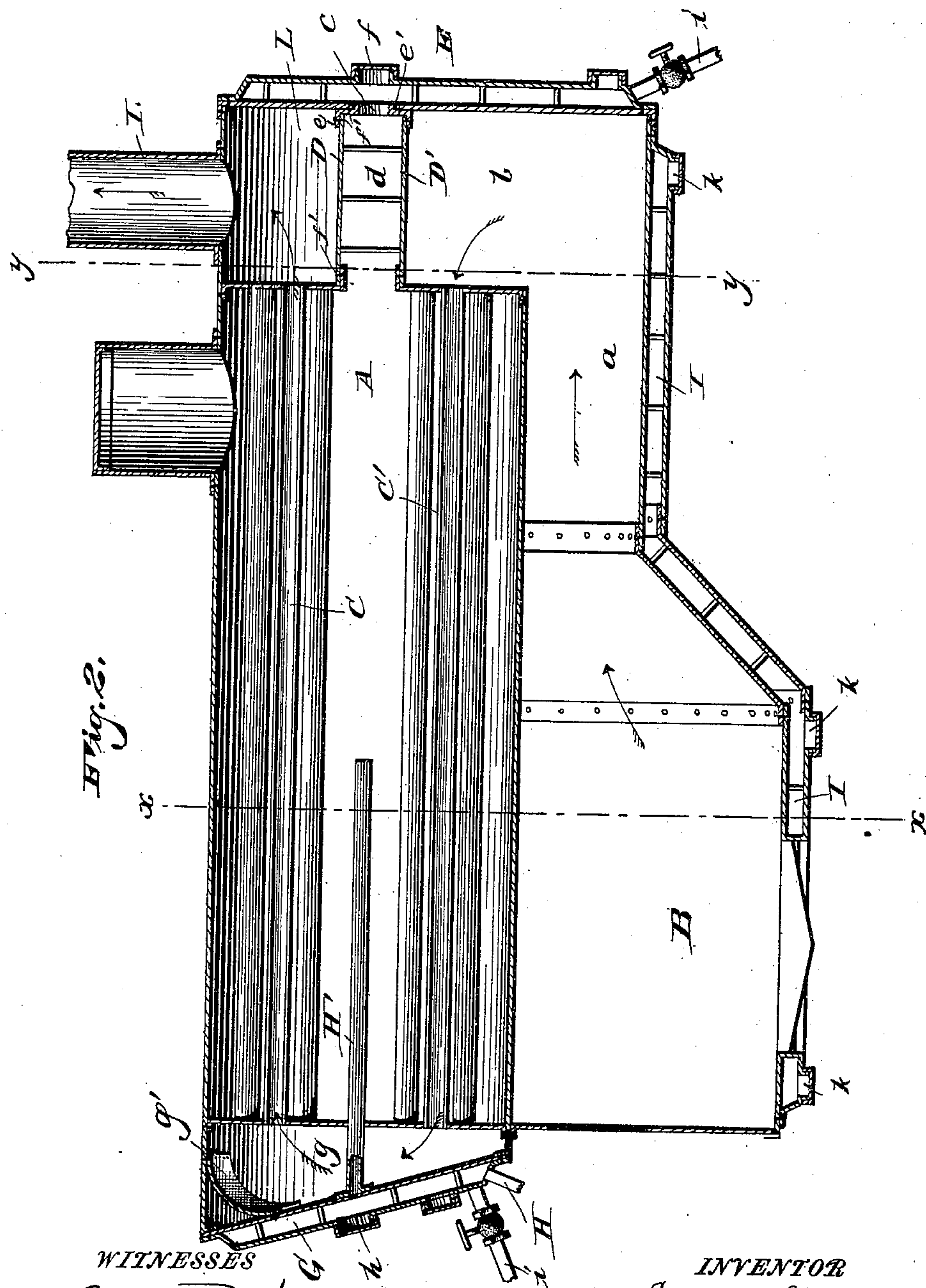
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# UNITED STATES PATENT OFFICE.

LEWIS W. LESTER, OF GLENCOE, MINNESOTA.

## STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 464,827, dated December 8, 1891.

Application filed August 6, 1891. Serial No. 401,924. (No model.)

*To all whom it may concern:*

Be it known that I, LEWIS W. LESTER, a citizen of the United States, and a resident of Glencoe, in the county of McLeod and State of Minnesota, have invented certain new and useful Improvements in Steam-Boilers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a side elevation. Fig. 2 is a vertical longitudinal section. Fig. 3 is a rear view. Fig. 4 is a vertical transverse section on line *x x*. Fig. 5 is a vertical transverse section on line *y y*.

This invention relates to certain new and useful improvements in steam-boilers or generators; and it consists in the novel construction and combination of parts as hereinafter specified.

In the accompanying drawings, the letter A designates the boiler proper, and B the fire-box located thereunder at one end.

C are the flues in the upper half of the flue-sheet, and C' the flues in the lower half.

*a* is the fire-flue leading from the fire-box under the waist of the boiler and into the smoke-box *b*, and thereby communicating with one end of the flues C'.

D is the upper crown-sheet, and D' the lower, having a water-space *d* between them running to and communicating through passage *c c'* with the water-front E at the rear of the boiler, which is bolted to said crown-sheet by bolts *e* around said water-passages and provided thereat with a packing-ring *e'*. These bolts may be reached through the hand-holes *f*. The water-front E is stayed by bolts *f'*, as are also the crown-sheets D and D'.

G is the water-front at the opposite end, separated from the ends of the flues by the smoke-chamber *g*, having the arch *g'*. This front is set obliquely, giving said smoke-chamber a greater width at top than at the bottom.

H is the feed-pipe to the boiler, which enters the water-front G at the bottom.

H' is a pipe bolted to water-front G through hand-hole *h* and discharging at the central portion of the boiler.

*i i* are blow-pipes for the water-fronts E and G, respectively, for the purpose of blowing out mud and scale.

I is a water-space around the fire-box and fire-flue *a*, provided with hand-holes *k*, by means of which it may be thoroughly cleaned.

K K' are passages through the waist of the boiler between the outer and inner plates to permit a thorough circulation of water from the boiler into water-space I.

L is a smoke-chamber above the upper crown-sheet and leads into the smoke-stack L'. The fire and heat from the fire-box pass through the flue *a* to the smoke-box *b*, thence through flues C' to smoke-chamber *g*, thence through flues C to smoke-chamber L and smoke-stack L', thereby utilizing the entire heat of the fuel consumed and consuming a less quantity to produce the amount of steam required.

It will be seen by the arrangement of the feed-pipe that the water will become greatly heated before entering the boiler.

The parts which are exposed to the greatest heat are entirely surrounded by water and thereby prevented from burning or rusting out. The flues C in upper flue-sheet serve to superheat and dry the steam, effecting a great saving of fuel and giving increased power.

It will be understood that I use the term "front" and "rear" in the above description and accompanying claims as applied to the respective ends of the boiler in the sense in which they are commonly employed in speaking of boilers and boiler-furnaces, the end at which the firing is done being known as the "front end," the opposite end being of course the rear, irrespective of the use to which the boiler is put.

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

1. A steam-boiler having the crown-sheets provided with a water-space between them,



a water-front held to said crown-sheets and having communication with said water-space, a water-jacket surrounding the fire-box and external flue, passages through the waist of the boiler into said water-jacket, and a water-front at the opposite end of the boiler forming the rear wall of a smoke-chamber separating said last-named front from the flue ends, whereby all parts exposed to great heat are protected therefrom, substantially as specified.

2. A boiler having a flue *a* underneath its waist and communicating at its rear end with a chamber *b*, communicating with one end of the lower flue, said chamber being surrounded by water-spaces, the combustion-chamber at the front communicating with the front ends of both upper and lower flues and separating them from a water-front at the rear, the chamber *L* at the upper rear portion of the boiler and communicating with the rearward ends of the upper flues and with the smoke-stack, said chambers *L* and *b* being separated from each other by crown-sheets *D D'*,

having a water-space between them communicating with a water-front *E*, substantially as specified.

3. The steam-boiler having the crown-sheets provided with a water-space between them, and a water-front bolted to said crown-sheets around apertures or passages connecting said water-front and water-space and provided with stay-bolts and packing, substantially as specified.

4. The steam-boiler having the water-front at the front end of the boiler separated from the flue ends by a smoke-chamber, a feed-pipe entering said water-front at its lower end, and the discharge-pipe bolted to said water-front and discharging centrally into said boiler, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

LEWIS W. LESTER.

Witnesses:

J. V. V. LEWIS,  
JOHN LINTEN.