

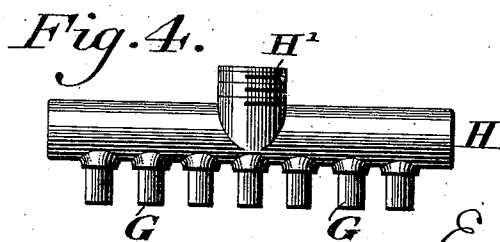
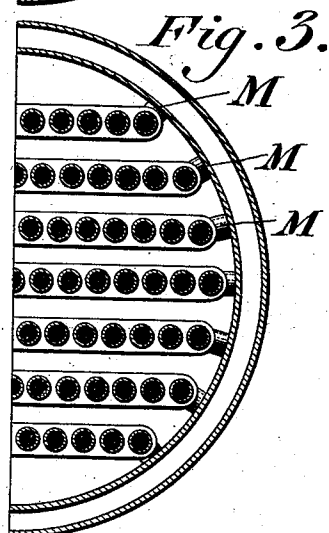
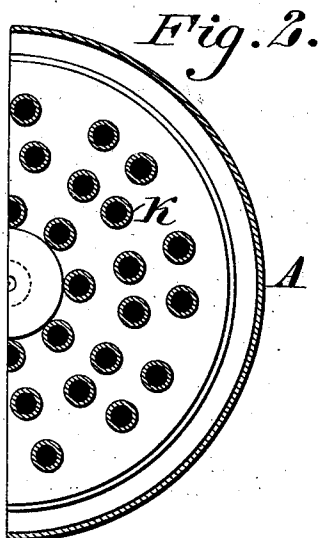
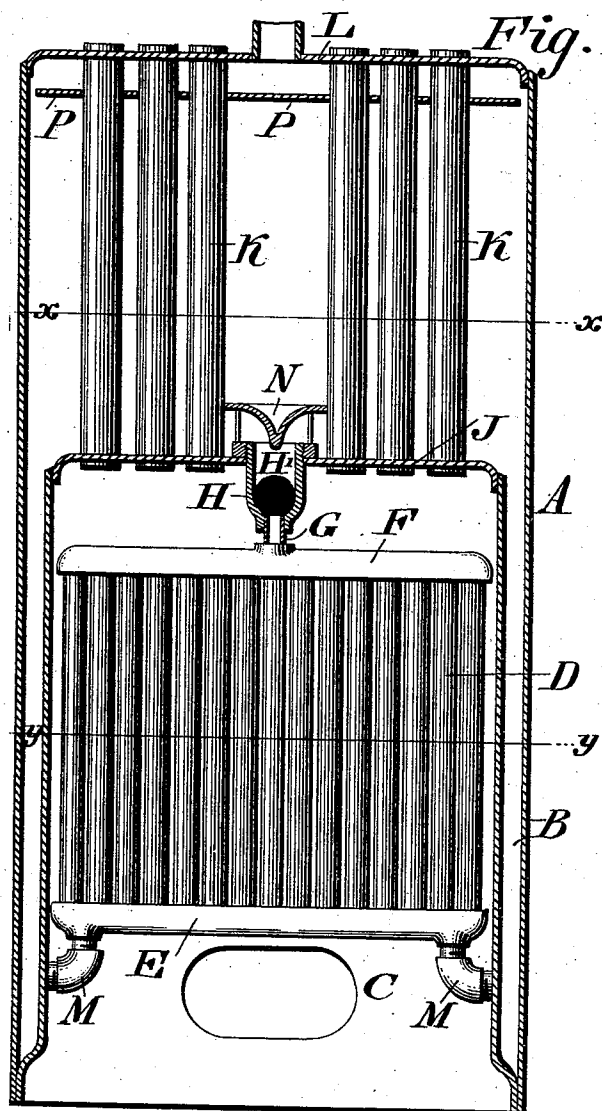
(No Model.)

E. U. GIBBS.
UPRIGHT BOILER.

2 Sheets—Sheet 1.

No. 501,711.

Patented July 18, 1893.



WITNESSES:

P. F. Stagle.
L. Douville.

INVENTOR
Eugene U. Gibbs
BY John A. Diederichsen
ATTORNEY.

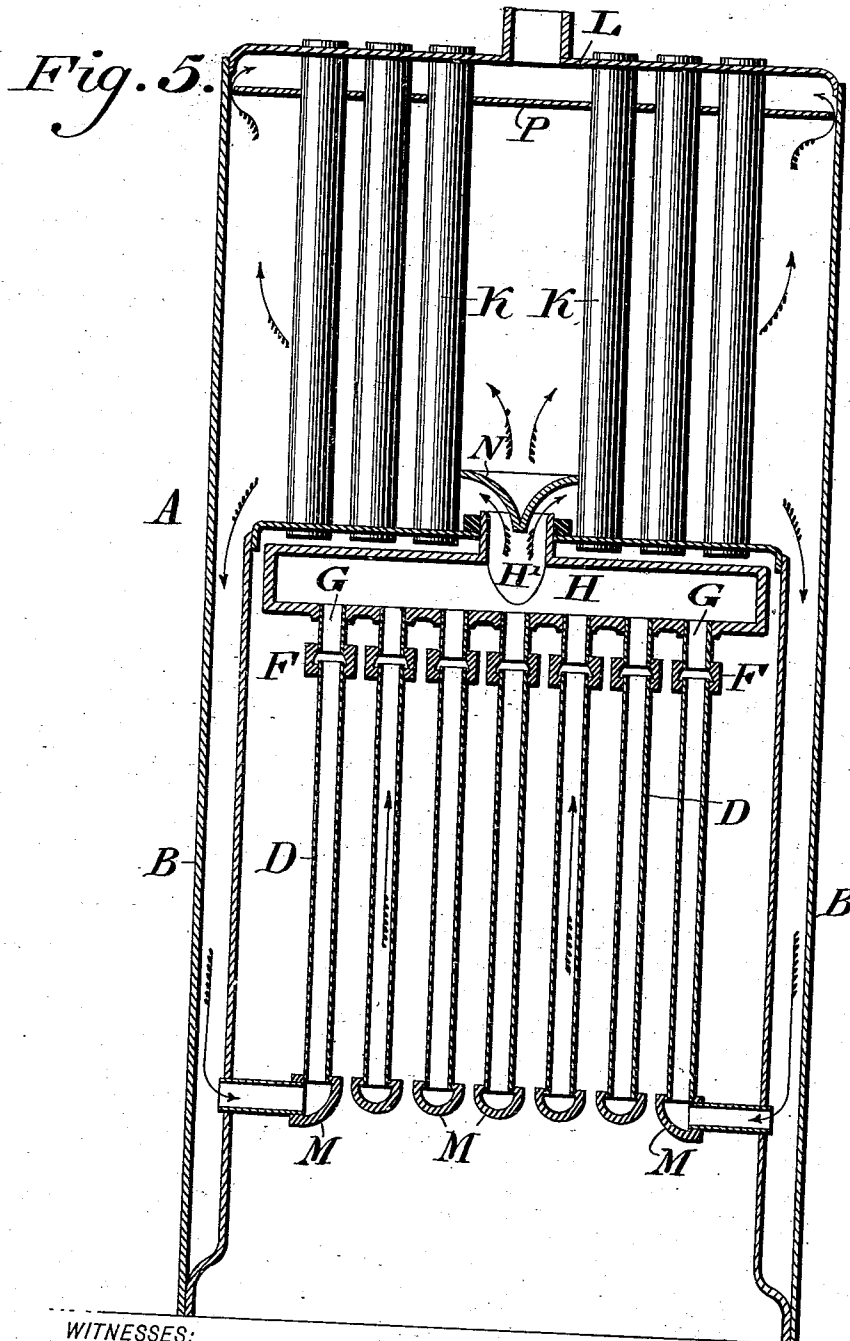
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E. U. GIBBS.
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

EUGENE U. GIBBS, OF MOUNT HOLLY, NEW JERSEY, ASSIGNOR OF THREE-FOURTHS TO RESTORE B. LAMB, OF SAME PLACE.

UPRIGHT BOILER.

SPECIFICATION forming part of Letters Patent No. 501,711, dated July 18, 1893.

Application filed October 6, 1892. Serial No. 447,997. (No model.)

To all whom it may concern:

Be it known that I, EUGENE U. GIBBS, a citizen of the United States, residing at Mount Holly, in the county of Burlington, State of New Jersey, have invented a new and useful Improvement in Upright Boilers, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of improvements in upright boilers, the construction, operation and advantages of the same being hereinafter fully set forth.

Figure 1 represents a vertical section of an upright boiler embodying my invention. Fig. 2 represents a horizontal section on line *x, x*, Fig. 1. Fig. 3 represents a horizontal section on line *y, y*, Fig. 1. Fig. 4 represents a side elevation of one of the tubes and adjacent portion detached from its connections. Fig. 5 represents a vertical section at a right angle to Fig. 1, the parts being on a different scale from said Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings: A designates the shell of a boiler and B the water leg thereof, within which is the fire box C.

D designates a series of vertical tubes which are connected at bottom with the transverse tubes E, and at top with the tubes F. Rising from the center of each of said tubes is a nipple G, which depends from the transversely extending tube H, the latter being connected with the crown sheet J. Within the upper part of the shell, above said crown sheet J are vertical flues K, which are connected at bottom with said crown sheet J and at top with the crown sheet L. The horizontal tubes E at the bottom of the tubes D, are secured to and in communication with the water leg B by means of nipples M.

It will be seen that the products of combustion pass between the tubes E, D, F, and around the same and reach the space above the tubes F, and act upon the tube H and the crown sheet J, and enter the upper flues K, from which they may be directed to the atmosphere by any suitable means, it being seen that I present large heating surfaces for the water, which as is evident, occupies the leg B, the nipple M, tubes E, D and F, nipple

G, tube H and the space of the shell around the upper flues K, thus producing steam in a rapid and effective manner.

N designates a deflector which is located in the shell A above the outlet branch H' of the tube H, the same preventing bubbling up or spouting of the steam and water that leaves said tube H and enters the shell above the crown sheet J.

In the upper part of the shell, below the crown sheet L, is a diaphragm P, which tightly embraces the flues K, and is slightly separated from the shell so as to leave a passage for steam between said diaphragm and shell, this serving to direct the steam around the extreme ends of the flues K within the shell, and thereby prevent unequal expansion and contraction and leakage of said flues.

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

1. An upright boiler having a series of vertical tubes, horizontal tubes within the top and bottom ends of the same, a tube connected with the upper horizontal flue, said horizontal flue being in communication with the upper portion of the shell of the boiler, substantially as described.

2. A shell having a crown sheet between the upper and lower portions thereof, flues in the upper portion of said shell connected with said crown sheet and the top crown sheet of the shell, a water tube below said flues communicating with the shell, a sheet between said flues and tube, and vertical water tubes connected at their upper ends with said horizontal tube and at bottom with the water leg of the boiler, substantially as described.

3. In a boiler, vertically extending water tubes connected at top and bottom by horizontal tubes in combination with a water tube which is centrally connected with the upper horizontal tube and located within the shell below hot air flues in the upper end of said shell, substantially as described.

4. A boiler having in the fire box thereof vertical tubes connected at top and bottom with upper and lower transverse tubes, a horizontal tube connected with the said upper transverse tube, nipples connecting the said horizontal tube with the water space of the

boiler, and deflectors located in the water space above said nipples, said parts being combined substantially as described.

- 5 5. A boiler having vertical combustion flues in its water space, and a diaphragm inclosing said flues, and having a space between it and the walls of the boiler, said diaphragm being

located a short distance below the top sheet of the boiler, said parts being combined substantially as described.

EUGENE U. GIBBS.

Witnesses:

JOHN A. WIEDERSHEIM,
R. H. GRAESER.