(No Model.)

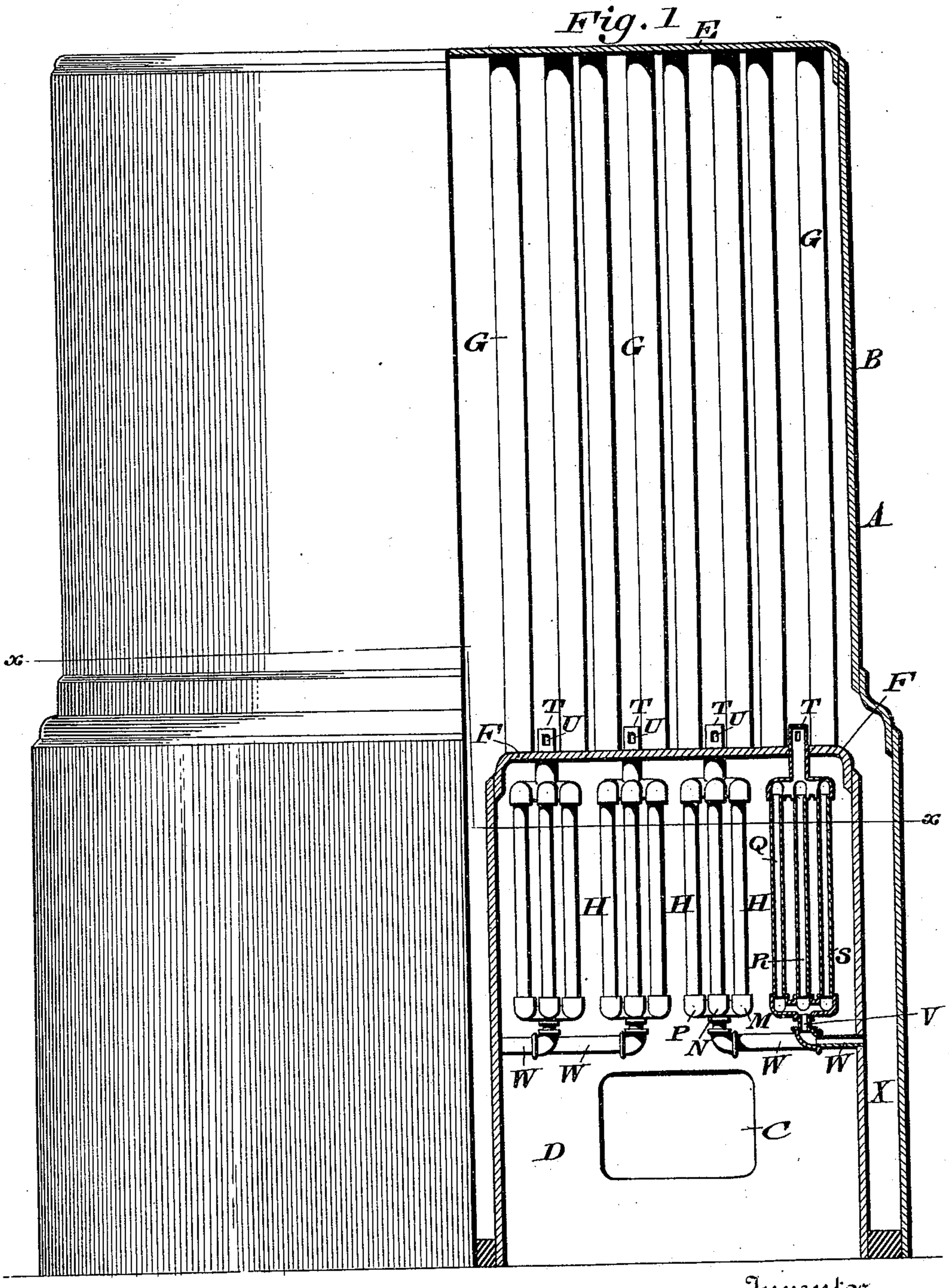
2 Sheets—Sheet 1.

E. U. GIBBS.

STEAM BOILER.

No. 552,362. Patented Dec. 31, 1895.

Fig. 1



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(No Model.)

2 Sheets—Sheet 2.

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STEAM BOILER.

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Fig. 3.

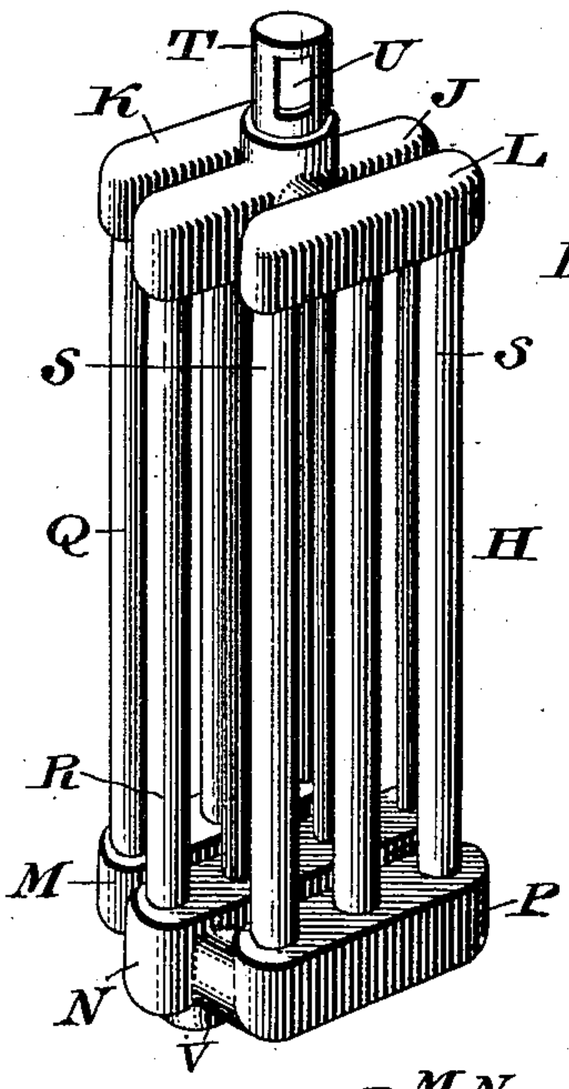


Fig. 2.

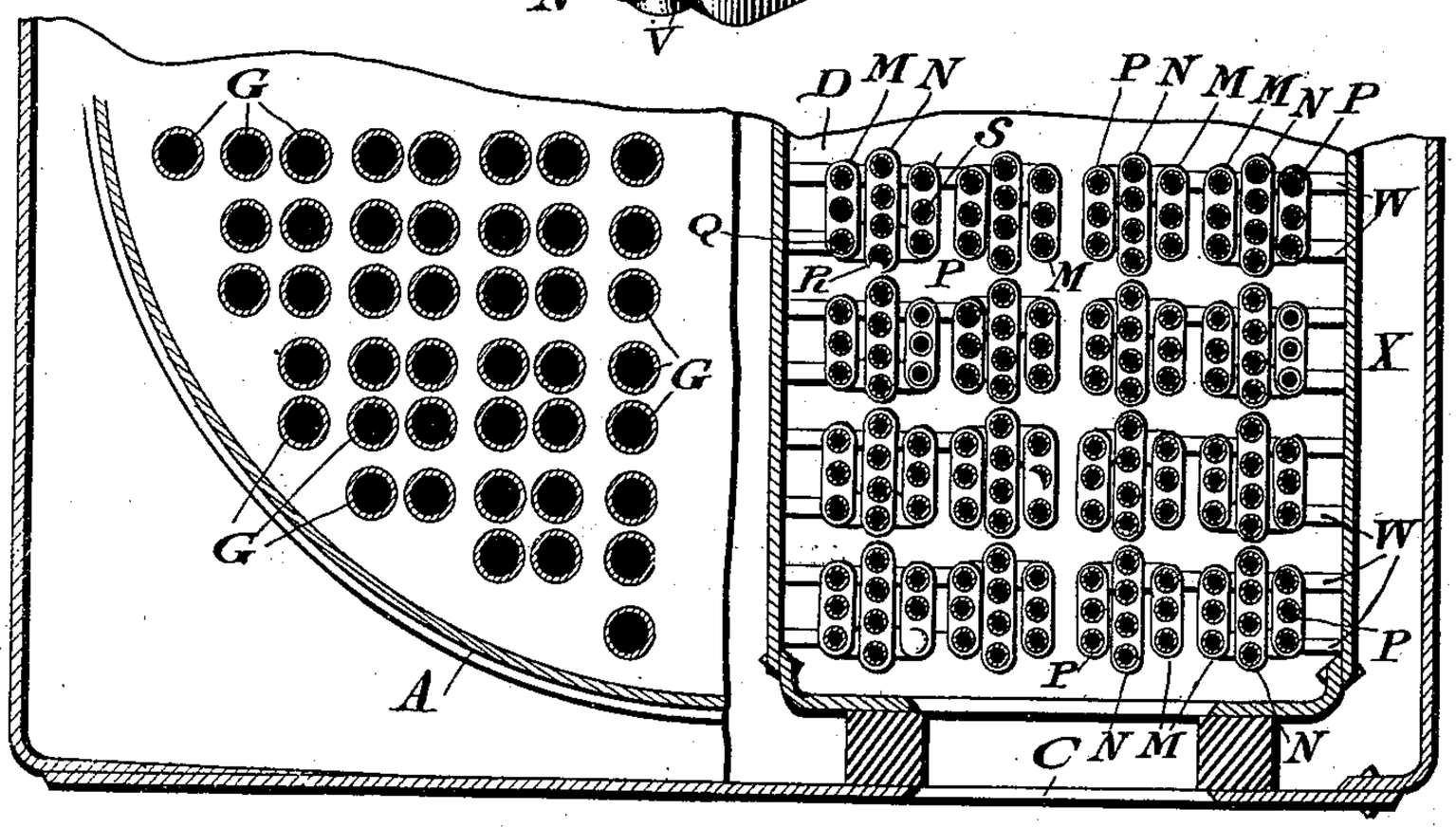
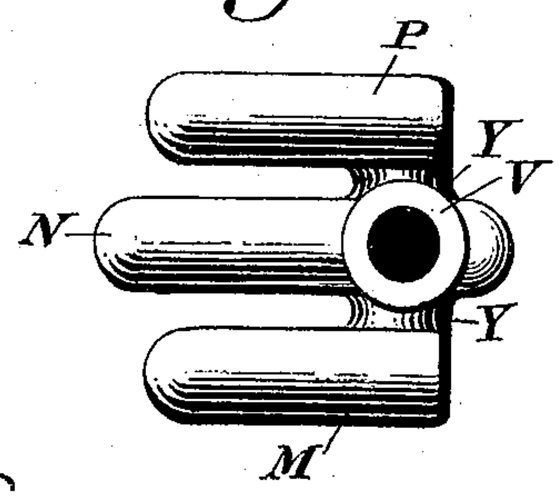


Fig. 4.



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UNITED STATES PATENT OFFICE.

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STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 552,362, dated December 31, 1895.

Application filed May 2, 1895. Serial No. 547,852. (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, in the State of New Jersey, have invented a new and useful Improvement in Steam-Boilers, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to steam-boilers; and it consists of novel attachments therefor, which are adapted to be placed within the fire-box of the boiler, thereby greatly increasing the evaporating capacity of the same, the circulation and the amount of heating-surface being also greatly augmented.

It further consists of a novel construction of the above attachment by means of which greater heating-surface and increased circulation are obtained.

It further consists of novel details of construction, all as will be hereinafter set forth.

Figure 1 represents a vertical section of a steam-boiler embodying my invention, a portion of the same being in elevation. Fig. 2 represents a section on line *x x*, Fig. 1. Fig. 3 represents, on an enlarged scale, a perspective view of a novel construction of auxiliary attachment employed. Fig. 4 represents a bottom plan view of the attachment seen in Fig. 3.

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

Referring to the drawings, A designates a boiler, the same being provided with an inclosing casing B, the fire-door C, and the combustion-chamber D, said boiler being also provided with a grate and ash-pit, and other appurtenances of the usual construction.

E and F designate the upper and lower tube-sheets, in which the fire-tubes G are secured.

H designates an auxiliary attachment or water-heating chamber, several of which are secured in the upper portion of the fire-box or combustion-chamber D, the construction of which chambers will be best understood from Fig. 3, the same consisting of the central header J and the headers K and L, at either side thereof, a communication being had between each of said headers.

M, N, and P designate the bottom headers, which are arranged under the respective headers K, J, and L, and are connected thereto by means of the water-tubes Q, R, and S, it being understood that said lower headers also communicate with each other at a point Y near their extremities, and that the central headers J and N are in the present instance longer than the adjacent headers on either side.

T designates a nozzle or nipple, having a closed top, which is attached in the present instance to the central header J, and is provided with a slot U therein, through which the water and steam are discharged into the boiler above the tube-sheet F.

V designates an opening in the lower header N, near the extremity thereof, by means of which communication is had with the interior of the boiler through the pipe W, which leads into the water-leg X, which surrounds the fire-box, as will be understood from Fig. 1.

It will be noticed in the present instance I have shown the central headers J and N connected by four tubes, while the outer headers K L and M P, respectively, are connected by three tubes; but it will of course be apparent that the number of said headers and tubes may be varied according to requirements, and it will further be apparent that the number of said attachments or water-holding chambers H (shown in Fig. 3) which are to be secured within the chamber D may be also increased or diminished, according to requirements, and the manner of attachment to the tube-sheet F and to the side of the fire-box or water-leg may also be varied, so as to still come within the scope of my invention.

The operation is as follows: The connection having been made between the water-leg of the boiler and the bottom of the chamber H, preferably at the point V, by means of the pipe W, it will be seen that as the water in said attachment H is subdivided into a number of small streams which flow through the pipes Q, R, and S the same will be heated very quickly and will thus cause a rapid upward circulation, the water being discharged through the outlet U of each chamber H, the colder and more sluggish water in the water-leg X being thus caused to circulate rapidly, being withdrawn at practically every point around the fire and discharged upwardly through the crown-sheet, a boiler of great evaporative ca-

pacity and having a very rapid circulation being thus produced.

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

1. A boiler having a water leg, upper and lower tube sheets, flues therebetween, and a series of water holding chambers located in the fire box of said boiler, said chambers consisting of the headers, K, J, L, and M, N, P, water tubes therebetween, a nipple extending upwardly from one of said headers, and closed at its top and having a slot in its sides, said nipple being extended through an adjacent tube sheet, one of the lower headers being provided with an opening, in combination with a conduit leading therefrom, to the interior of the boiler, substantially as described.

2. The herein described attachment or water chamber consisting of the headers K, J, L, and M, N, P, water tubes therebetween, a nipple leading from said header J at above its central point, closed at its top, and having a slot in its sides, and an opening in the lower central header at one side of its center, substantially as described.

3. The herein described attachment or water holder chamber, consisting of the header J, having a centrally located nipple, with a closed top, and slots in its sides, the adjacent headers K and L, the lower headers M, N, and P, the water tubes intermediate the above headers, the inlet V removed to one side, and the communication between said lower headers adjacent said inlet V, substantially as described.

4. A boiler having a water leg, upper and lower tube sheets, flues therebetween and a series of water holding chambers located within the fire box of said boiler, consisting of the header J having the centrally located nipple with a closed top, and a slot in its sides, said nipple extending through the adjacent tube sheet, the headers K and L adjacent said header J, the lower headers M, N, and P, water tubes intermediate said headers, the inlet V removed to one side, and a communication between said lower headers, adjacent said inlet V, in combination with a conduit leading from the latter to the water leg or interior of the boiler, substantially as described.

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