B. T. BABBITT.

Sectional-Boiler.

No. 167,292. Patented Aug. 31, 1875.

Fig: 1

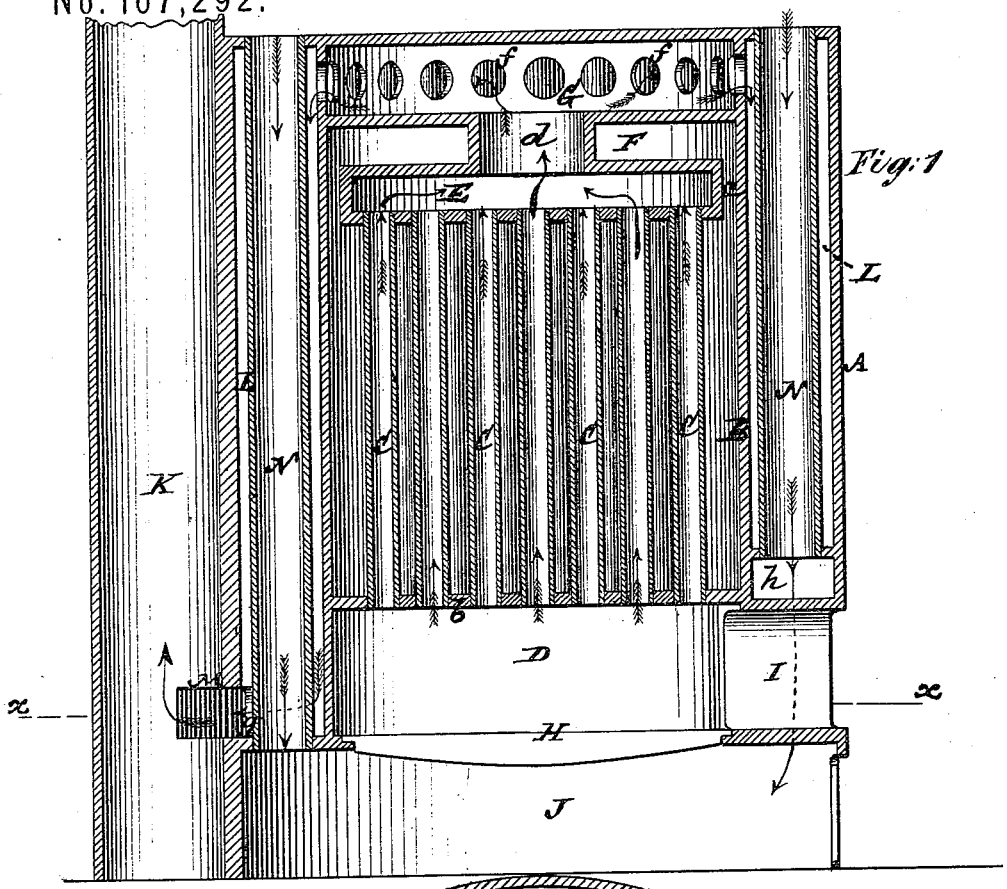
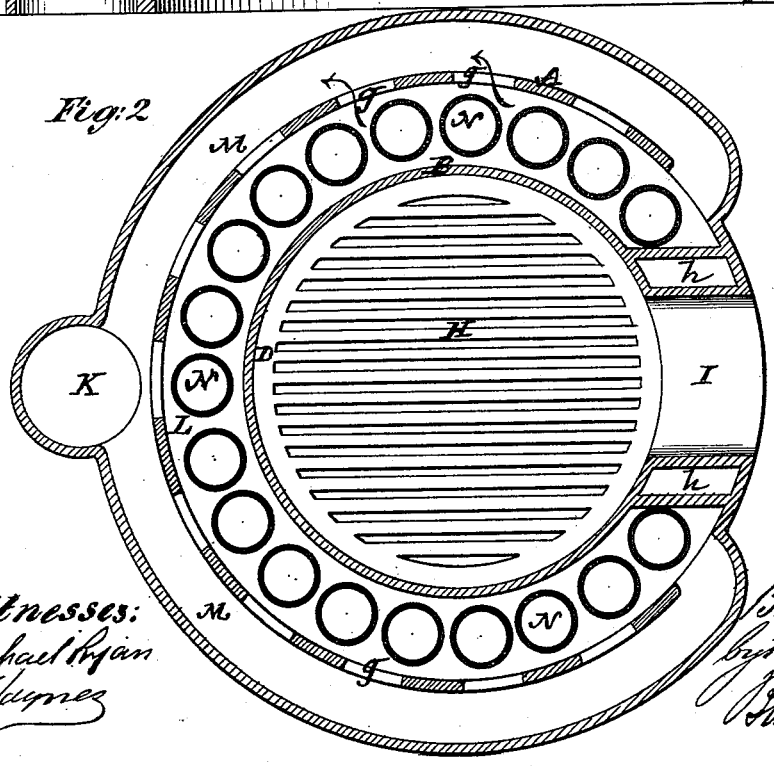


Fig: 2



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BENJAMIN T. BABBITT, OF NEW YORK, N. Y.

IMPROVEMENT IN SECTIONAL BOILERS.

Specification forming part of Letters Patent No. **167,292**, dated August 31, 1875; application filed June 23, 1875.

To all whom it may concern:

Be it known that I, BENJAMIN T. BABBITT, of the city, county, and State of New York, have invented a new and useful Improvement in Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, which forms part of this specification.

This invention consists in certain combinations of tubes, flues, and passages, applied to a vertical steam-boiler, whereby a most efficient and economical heating-surface is obtained for the rapid production of steam; also hot air freely supplied to the furnace of the boiler, and the whole made to combine great compactness with strength.

In the accompanying drawing, Figure 1 represents a vertical section of a steam-boiler having my invention applied; and Fig. 2 a horizontal section on the line *x x*.

A is the outer case of the boiler, which is cylindrical. Centrally within this outer case is a cylindrical chamber, B, which forms the water-space of the boiler, and which is stocked or provided with upright smoke-tubes C, arranged to establish communication between the fire-chamber D, through the crown-sheet *b*, and an upper cylindrical smoke-box, E, of somewhat less diameter than the chamber B, so as to leave an annular space, *c*, around said smoke-box, for the escape of steam from the chamber B into a drum or cylindrical chamber, F, from whence the steam may be drawn off as required. The crown-sheet of this steam drum or chamber F extends across the chamber B, leaving a second or upper smoke chamber, G, in the upper part of the chamber B, and which smoke-chamber is in free communication, by a neck or passage, *d*, with the smoke-box E below it. H is the fire-grate, and I the feed-opening of the fire-place D. J is the ash-pit, and K the smoke-stack or chimney.

The products of combustion escape from the upper smoke-chamber G through upper lateral distributing-apertures *f*, into an annular jacket, L, which is composed of the space lying between the outer case or shell A and the cylinder B. The products of combustion thus admitted to and around the cylinder B pass down said annular jacket L, which acts as a return-flue, and ultimately pass out through lower lateral distributing-apertures *f* into a lower horizontal flue, M, on the outside of the case A, and from thence into the chimney K.

N N are air-heating tubes, made to project down within the annular jacket L, and connecting the ash-pit J with the air-space above the boiler. Said tubes may form a continuous annular cluster around the cylinder B, and, where the fuel-feed opening I occurs, may connect with a passage, *h*, outside of or inclosing the top and sides of said opening or fuel-way, and the passage *h* be made to communicate at its bottom with the ash-pit. The other tubes N directly connect with the ash-pit.

A vertical boiler, constructed as described, not only combines compactness with strength, but is exceedingly economical as regards its consumption of fuel, and generates steam rapidly. Thus, the boiler-furnace or ash-pit thereof is copiously supplied with well-distributed columns of air descending within the tubes N, and which are highly heated before reaching the ash-pit by reason of the exposure of said tubes to the products of combustion within the annular jacket L, and radiation from the cylinder B, thus promoting combustion by supplying the furnace with hot air which is introduced in a distributed manner to the ash-pit. A very large and efficient fire or heating surface is also provided for the boiler by reason of the interior smoke flues or tubes C, the smoke-chambers E G, having the steam drum or space F in between them, and the outside return flue or jacket L. This combination not only effects a most perfect utilization of the products of combustion, but loss of heat by outside radiation from the boiler proper is prevented.

I claim—

The air-heating tubes N, in combination with the annular jacket or return flue L, the cylinder B, with its direct smoke tubes or flues C, the outer case A, and the ash-pit J, essentially as shown and described.

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