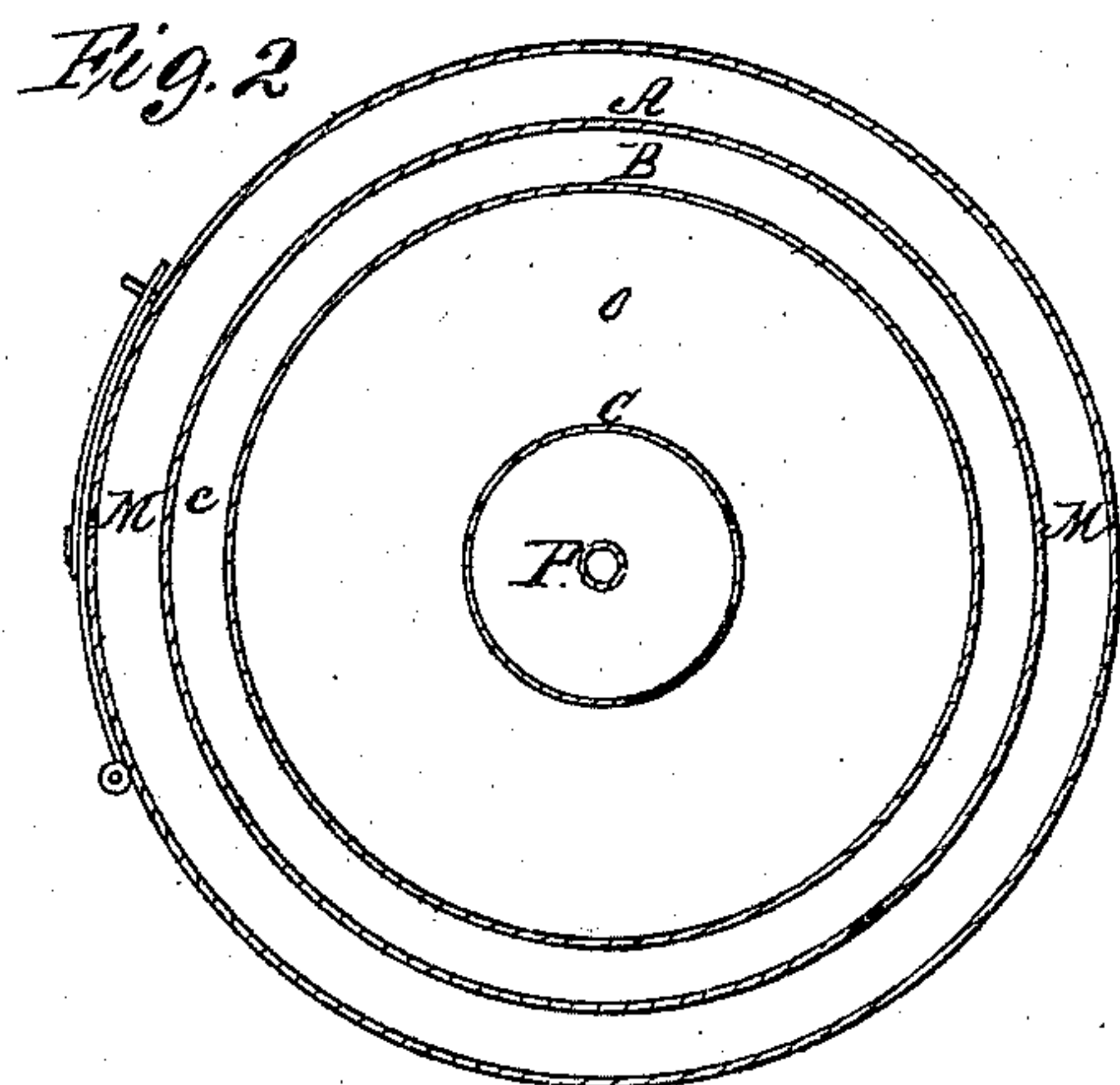
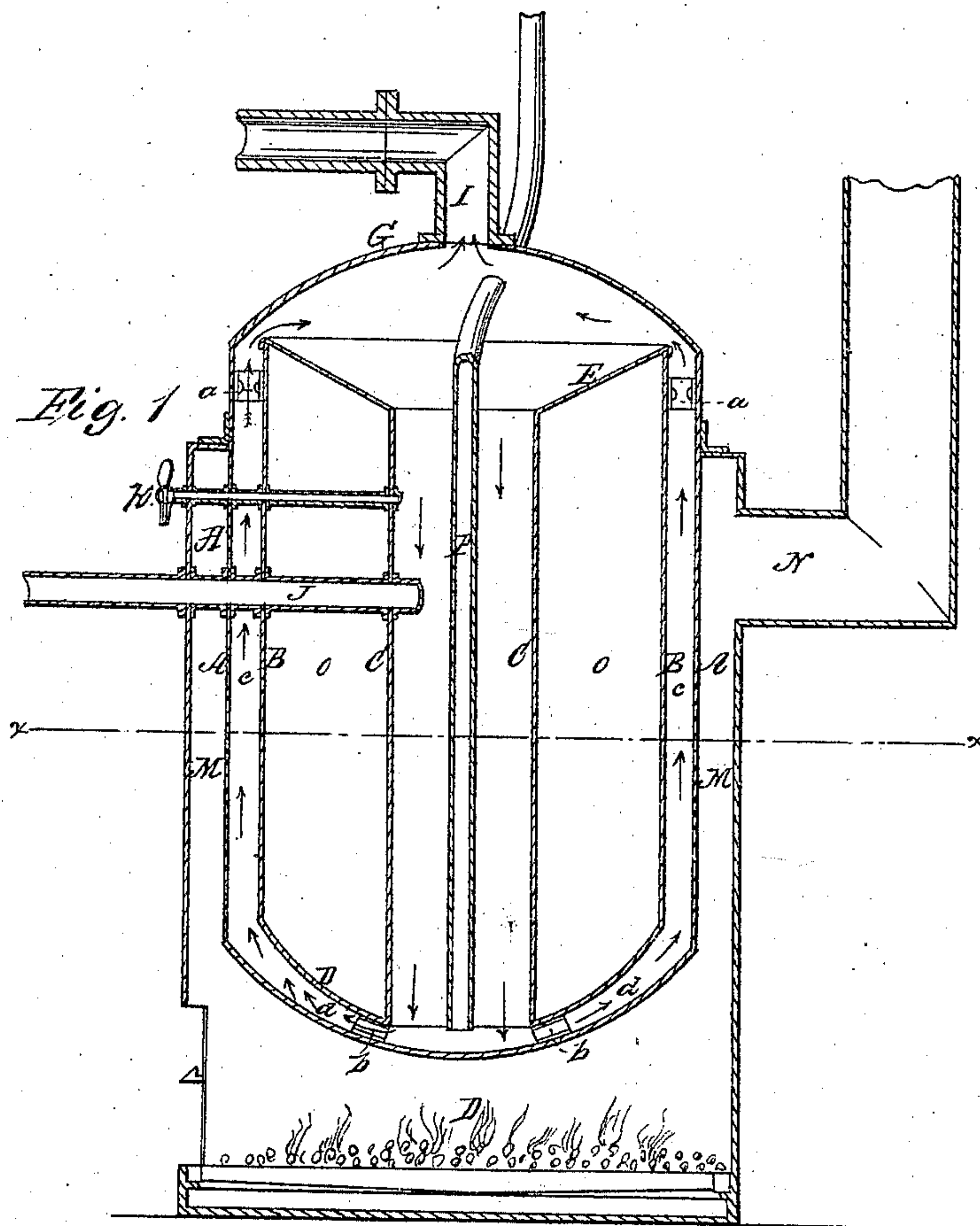


*P. Sweeney,*  
*Steam-Boiler Water-Tube.*  
*N<sup>o</sup> 11,089.      Patented June 13, 1854.*



# UNITED STATES PATENT OFFICE.

PETER SWEENEY, OF BUFFALO, NEW YORK.

## IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. 11,089, dated June 13, 1854.

*To all whom it may concern:*

Be it known that I, PETER SWEENEY, of Buffalo, in the county of Erie 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 drawings, forming part of this specification, in which—

Figure 1 is a vertical section through the center of a steam-boiler constructed according to my invention. Fig. 2 is a horizontal section of the same in the line  $x x$  of Fig. 1.

Similar letters of reference indicate corresponding parts in both figures.

This invention consists in placing within a boiler of cylindrical or other form an annular casing containing sand or other poor conducting material, said casing dividing the interior of the boiler, so as to form a central water-cylinder communicating at the bottom with an external annular water-space. The external water-space is exposed to the heat of the fire, but exposes only a thin body of water to its action at a time, while the water in the cylinder is at a comparatively low temperature. The effect of this is to raise steam very rapidly in the external water-space, and to keep up a constant circulation of water from the cylinder to the said space to supply the place of that evaporated.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A represents the outer shell of the boiler, which is in the form of a cylinder placed vertically and having its top G and bottom H of concave form internally. B is an inner cylinder of a diameter less than A, and C is another cylinder of a diameter about one-third of A. The cylinders B and C are united at the bottom by a ring D, which is of convex form outwardly, and at the top by a ring E of the form of an inverted frustum of a cone. The cylinder B is united with A by braces  $a a$ , and together with the cylinder C is supported by small standards  $b b$ , resting on the bottom H. The entire space between B and C is filled with sand

or any other poor conducting material, forming a non-conducting tube O. The space  $c$  between A and B is the external water-space and the cylinder C is the central water-cylinder. The communication between the external space and central cylinder is all round the narrow space  $d$  between the ring D and the bottom of the boiler. The water when at the proper level reaches nearly to the top of C and  $c$ , but is never intended to overflow from one to the other. The concave top G of the boiler forms a steam chamber or dome, from the top of which rises the steam-pipe I. The feed-pipe J enters the central cylinder C, and the gage-cock K also communicates with the said cylinder. The blow-off pipe P leads from the bottom of the boiler through the central cylinder C and passes through the dome G.

The fire-place L is immediately under the boiler, and the flame and heated products of combustion pass up an annular flue M, which entirely surrounds the outside of the boiler. The chimney N leaves the upper part of this flue. The heating-surface is the bottom H of the boiler and the outside of the cylinder A, all of which, except a small portion in the center of the bottom, is but thinly covered with water. The heat is thus concentrated upon a small quantity of water, being prevented in a great measure by the non-conducting tube O from being absorbed by the water in the central cylinder, which is only kept at such a temperature as to prevent the condensation of the steam in the steam-chamber. The steam generated in the spaces  $d$  and  $c$  passes upward through  $c$  into the steam-chamber, and fresh water to take the place of that evaporated is supplied by gravitation from C, which may be considered as a reservoir. Thus a constant and rapid circulation of the whole of the water is always kept up, as indicated by arrows in Fig. 1.

This boiler is not of costly construction, and is very durable. It is free from liability to accident, as it is scarcely possible for any part which is exposed directly to the fire to be left uncovered by water.

What I claim as my invention, and desire to secure by Letters Patent, is—



Dividing the interior of the boiler by an annular casing B C, filled with non-conducting material, or by a non-conducting tube O, formed in any convenient and suitable manner, so as to form an external water-space *c*, which exposes a thin body of water to the action of the fire, and an inner or central cyl-

inder C, in which the water is kept at a comparatively low temperature, substantially as herein set forth.

PETER SWEENEY.

Witnesses;

HORACE PRENTICE,  
EDWD. F. FOLGER.