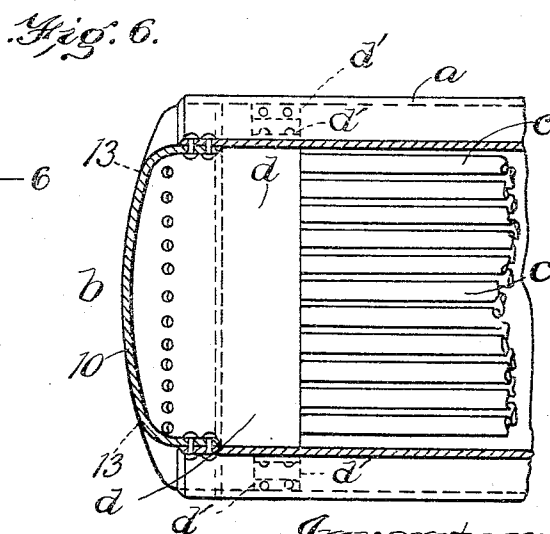
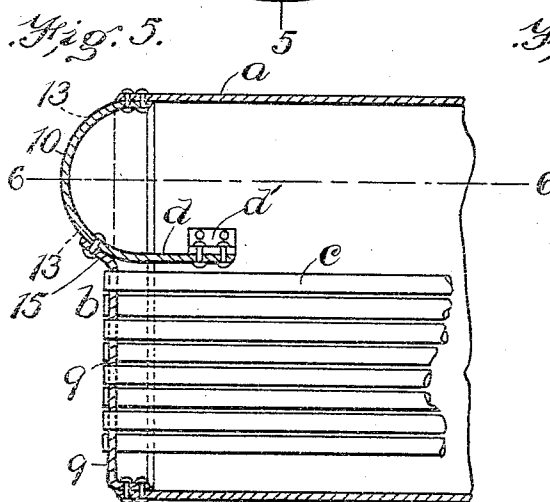
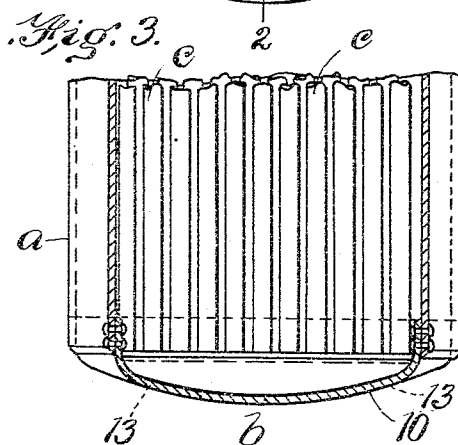
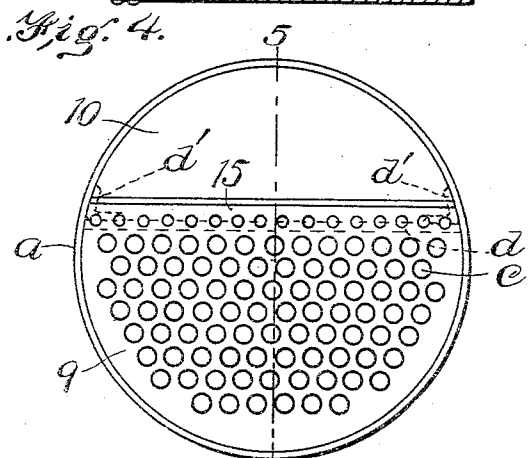
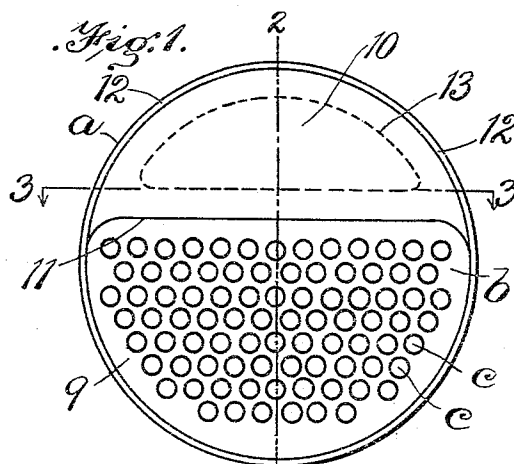
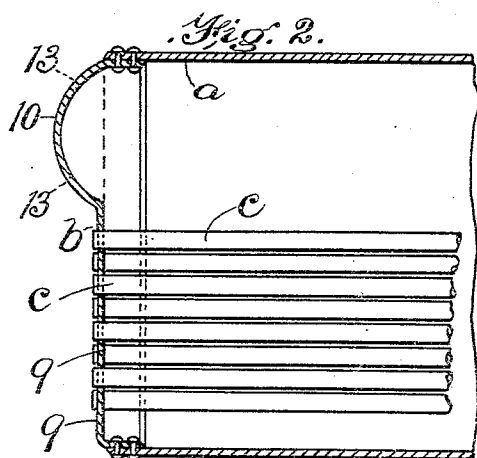


G. H. RHEUTAN.  
BOILER TUBE SHEET.  
APPLICATION FILED JAN. 29, 1904.



Witnesses:

H. L. Robbins.  
E. Batchelder

Inventor:

G. H. Rheutan  
by Knight, Brown & Quincy  
Attys.

# UNITED STATES PATENT OFFICE.

GARRETT H. RHEUTAN, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO ROBERT B. LINCOLN, OF WALTHAM, MASSACHUSETTS.

## BOILER TUBE-SHEET.

SPECIFICATION forming part of Letters Patent No. 779,136, dated January 3, 1905.

Application filed January 29, 1904. Serial No. 191,078.

*To all whom it may concern.*

Be it known that I, GARRETT H. RHEUTAN, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Boiler Tube-Sheets or Heads, of which the following is a specification.

This invention relates to the heads of fire-tube boilers, and particularly to the portion of the head which is above the fire-tubes and is directly exposed to the steam-pressure.

The invention has for its object to provide a construction of this portion of a boiler-head which will insure suitable strength and resistance to steam-pressure.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a front elevation of a fire-tube boiler having a head embodying my invention. Fig. 2 represents a section on line 2 2 of Fig. 1. Fig. 3 represents a section on line 3 3 of Fig. 1. Fig. 4 represents a view similar to Fig. 1, showing the head composed of a plurality of parts. Fig. 5 represents a section on line 5 5 of Fig. 4. Fig. 6 represents a section on line 6 6 of Fig. 5.

The same reference characters indicate the same parts in all the figures.

In the drawings, *a* represents the shell of a fire-tube boiler, *b* represents one of the heads, and *c c* represent the fire-tubes affixed in the usual or any suitable manner to the lower or tube-sheet portion 9 of the head *b*, said portion being preferably flat.

The head *b* is provided with an upper portion 10, the cross-section of which is crowning or internally concave and externally convex and bulges outwardly from the plane of the tube-sheet portion 9, the side elevation of said portion presenting a substantially semicircular appearance, with a substantially straight lower edge 11 and a segmental upper edge 12. The curvature of the portion 10 is

such that its marginal portion between its outer edge and an imaginary line 13 within and parallel with said edge constitutes a substantially semicircular continuous truss, which is so inclined relatively to the general plane of the head that it is presented approximately edgewise to the direction of pressure from within the boiler, and therefore so stiffens and strengthens the head that the necessity for staying its upper portion is avoided. At the same time the lower portion of said truss extending horizontally across the head is sufficiently inclined or departs sufficiently from a horizontal position in cross-section to prevent the lodgment of sediment on its inner surface, where such sediment would be likely to be hardened by the heat to which the external surface of the head is exposed.

*d* represents a horizontal flange or supplemental truss which extends across the inner side of the head and projects inwardly from the lower portion of the above-described truss. The said supplemental truss and the crowning portion 10 are preferably made in one piece, as shown in Fig. 5, the tube-sheet portion 9 being made in a separate piece and provided with a flange 15 at its upper edge, which is riveted to the crowning portion 10. The ends of the supplemental truss *d* are preferably provided with ears *d'*, which are riveted to the sides of the boiler-shell. The supplemental truss strengthens the boiler and being within the boiler is not injuriously affected by heat, and therefore may present a horizontal upper surface of any desired width, the deposit of sediment on said surface being unobjectionable.

I claim—

1. A boiler-head for fire-tube boilers, comprising a substantially flat tube-sheet portion, and an internally concave and externally convex upper portion having a substantially semicircular vertical cross-section, a substantially straight lower edge, and a segmental upper edge, said upper portion having a continuous

marginal truss of uniform width, said truss being uniformly inclined in cross-section at all points.

2. A boiler-head for fire-tube boilers, comprising a substantially flat tube-sheet portion, an internally concave and externally convex upper portion having a continuous marginal truss, and a substantially horizontal supple-

mental truss extending across the head and projecting inwardly therefrom.

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

GARRETT H. RHEUTAN.

Witnesses:

C. F. BROWN,  
E. BATCHELDER.