

No. 671,782.

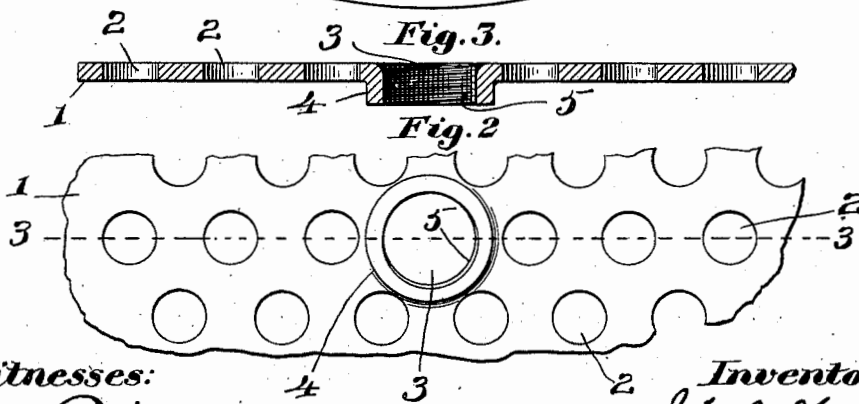
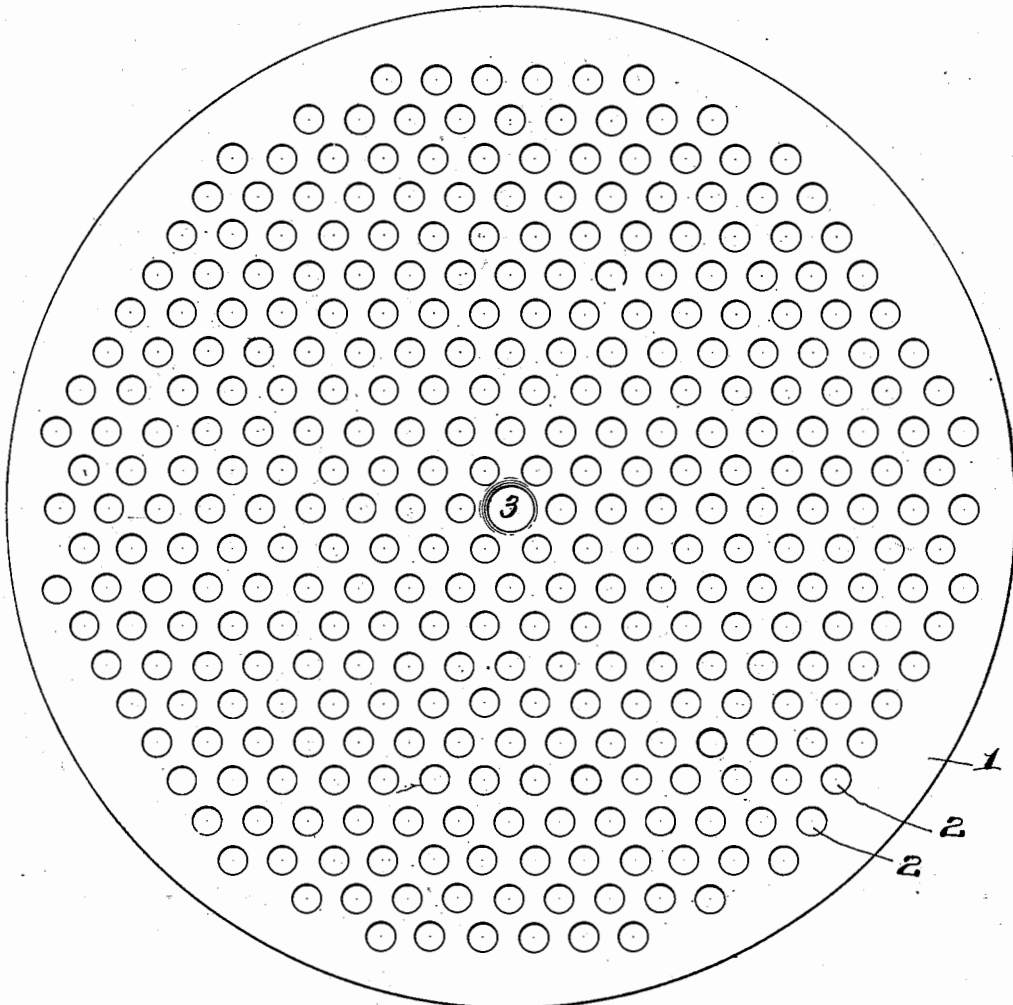
Patented Apr. 9, 1901.

J. C. SPEIRS.  
TUBE SHEET FOR BOILERS.

(Application filed Feb. 14, 1900.)

(No Model.)

*Fig. 1.*



Witnesses:  
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# UNITED STATES PATENT OFFICE.

JOHN C. SPEIRS, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE  
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## TUBE-SHEET FOR BOILERS.

**SPECIFICATION** forming part of Letters Patent No. 671,782, dated April 9, 1901.

Application filed February 24, 1900. Serial No. 6,402. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN C. SPEIRS, of Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Tube-Sheets for Automobile-Boilers, of which the following is a specification.

This invention relates to boilers of the fire-tube type for automobile vehicles; and it consists in a certain novel feature of construction in the tube-sheet of such a boiler.

Of the accompanying drawings, Figure 1 represents a plan view of a tube-sheet constructed in accordance with my invention.

Fig. 2 represents a vertical central section thereof enlarged. Fig. 3 represents a reverse plan view enlarged.

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

Referring to the drawings, 1 designates a tube-sheet having the usual series of perforations 2 2 to receive the ends of a series of fire-tubes. The sheet represented is the upper tube-sheet of a small steam-boiler of the type employed in steam-driven automobile vehicles, and in accordance with common practice in the construction of such boilers the tube-sheet 1 is provided at or near its center with an aperture 3, in which the steam-pipe which conducts steam from the boiler to the engine is affixed.

My invention consists in the structure afforded by drawing down an annular flange 4 around the aperture 3, said flange projecting or standing out from the plane of the sheet 1, the flange and sheet inclosing an elongated aperture, the wall of which is provided with a female screw-thread 5. An increased base of attachment is thus afforded for the threaded end of the steam-pipe.

I am well aware that it is not new to form an outstanding flange on the cast-metal wall of a steam-chamber for the purpose of obtaining an elongated threaded opening for the attachment of a pipe. I am also aware that

flanges have been drawn out or spun on sheet-metal disks or plates and screw-threaded on the inside in various arts other than the boiler art. I disclaim all such prior constructions.

It is well known that tube-sheets of fire-tube boilers for reasons of strength and durability cannot with advantage be made of cast metal. Said tube-sheets are commonly made of rolled sheet metal or "boiler-plate." The shell, including the tube-sheets, of a small boiler, such as an automobile-boiler, is for reasons of lightness, durability, quick steaming, &c., made as thin as consistent with the necessary degree of strength, and the upper tube-sheet is commonly made so thin as to afford very little base or hold for the attachment of the steam-pipe when the length of the screw-threaded aperture is confined to the thickness of the tube-sheet. By flanging a tube-sheet of the ordinary thickness around the steam-pipe aperture and screw-threading said aperture for its whole length I am enabled to strengthen the joint between the tube-sheet and the steam-pipe without adding appreciably to the cost of constructing the boiler. The flange 4 may be turned out of the tube-sheet by any well-known or suitable process. The flange preferably comes on the under side of the tube-sheet, so as to be within the boiler.

I claim—

A tube-sheet for automobile-boilers, said sheet having a series of unflanged openings for receiving the ends of the fire tubes or flues, and a flange turned out of the plane of the sheet on the inner side thereof, said flange inclosing an elongated aperture communicating with the interior of the boiler and internally threaded for the attachment of the steam-pipe.

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

JOHN C. SPEIRS.

Witnesses:

H. L. ROBBINS,  
A. D. HARRISON.