

(No Model.)

E. T. SEDERHOLM.
STEAM BOILER.

No. 548,664.

Patented Oct. 29, 1895.

Fig. 1.

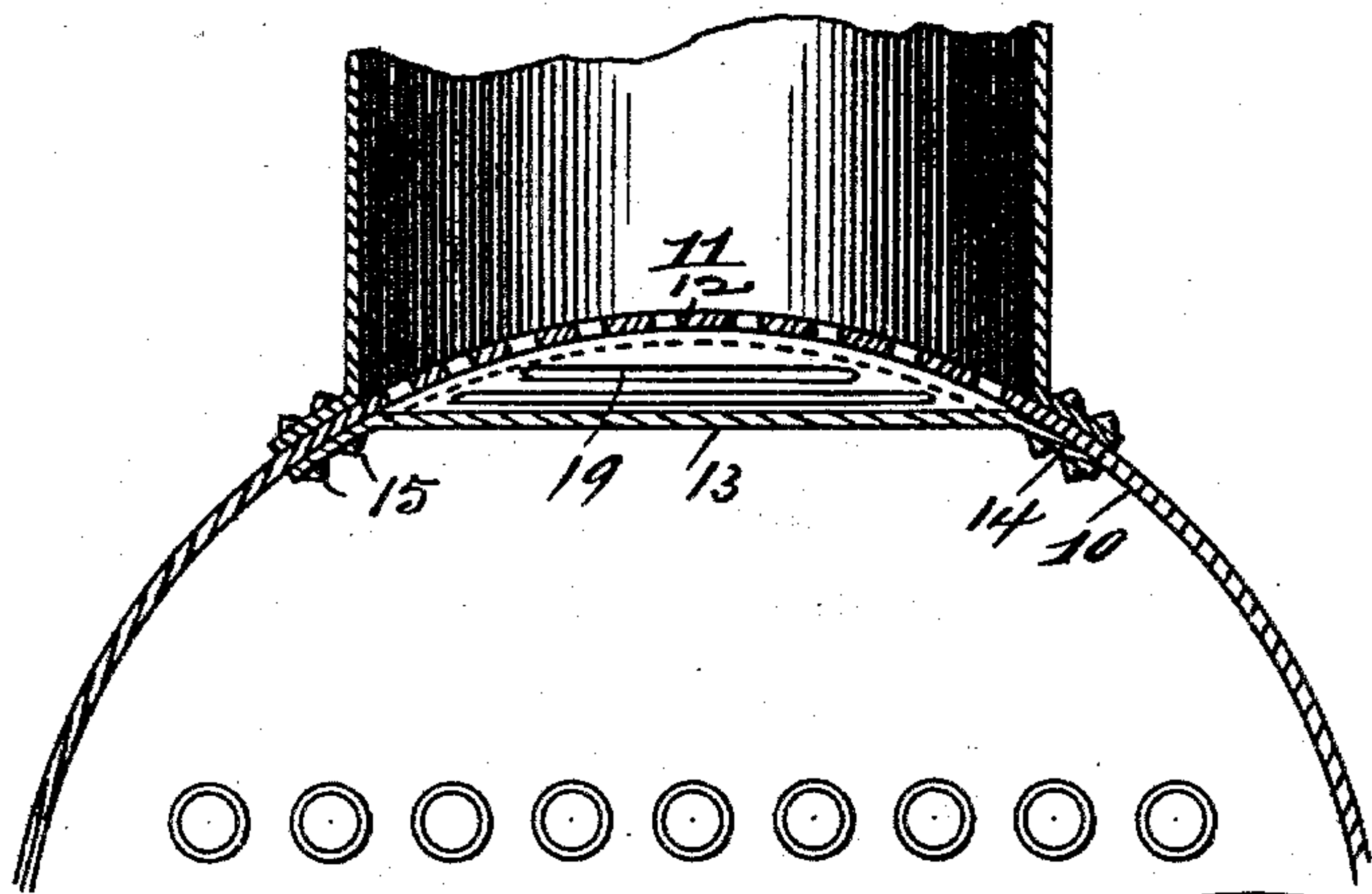


Fig. 2.

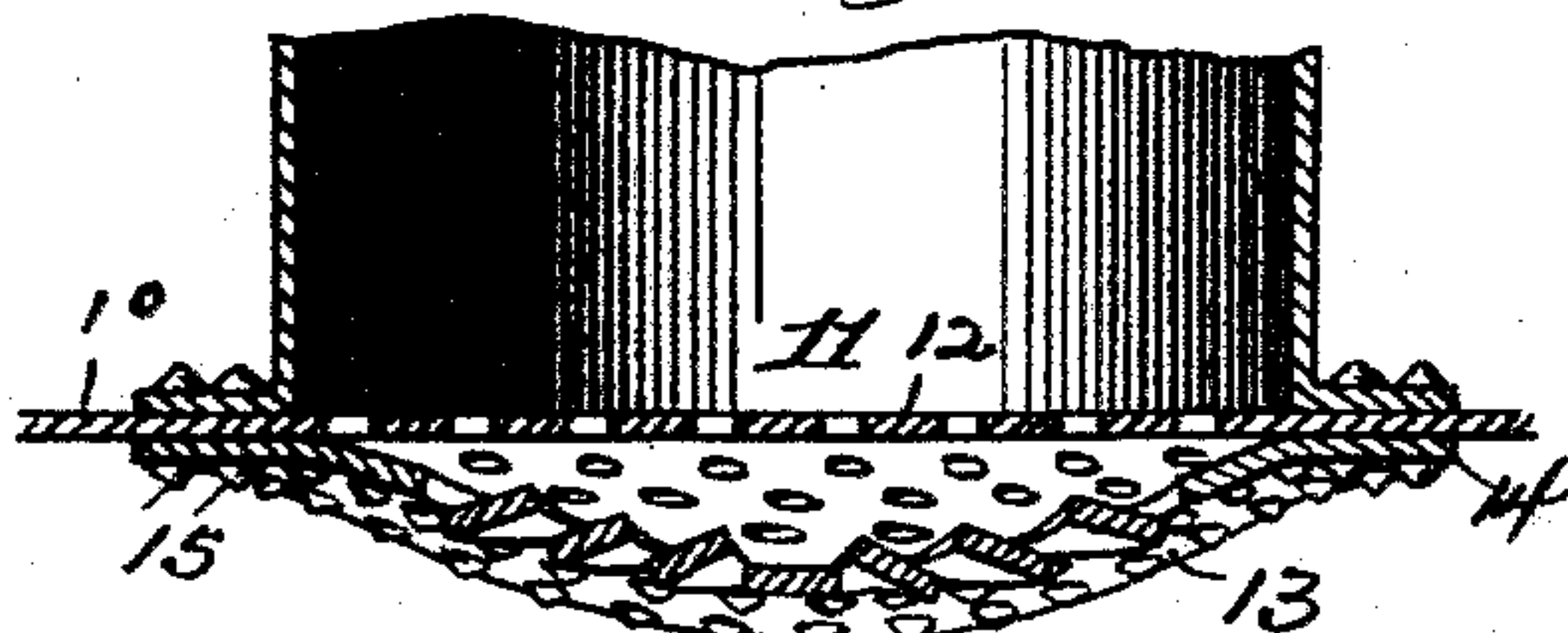


Fig. 4.

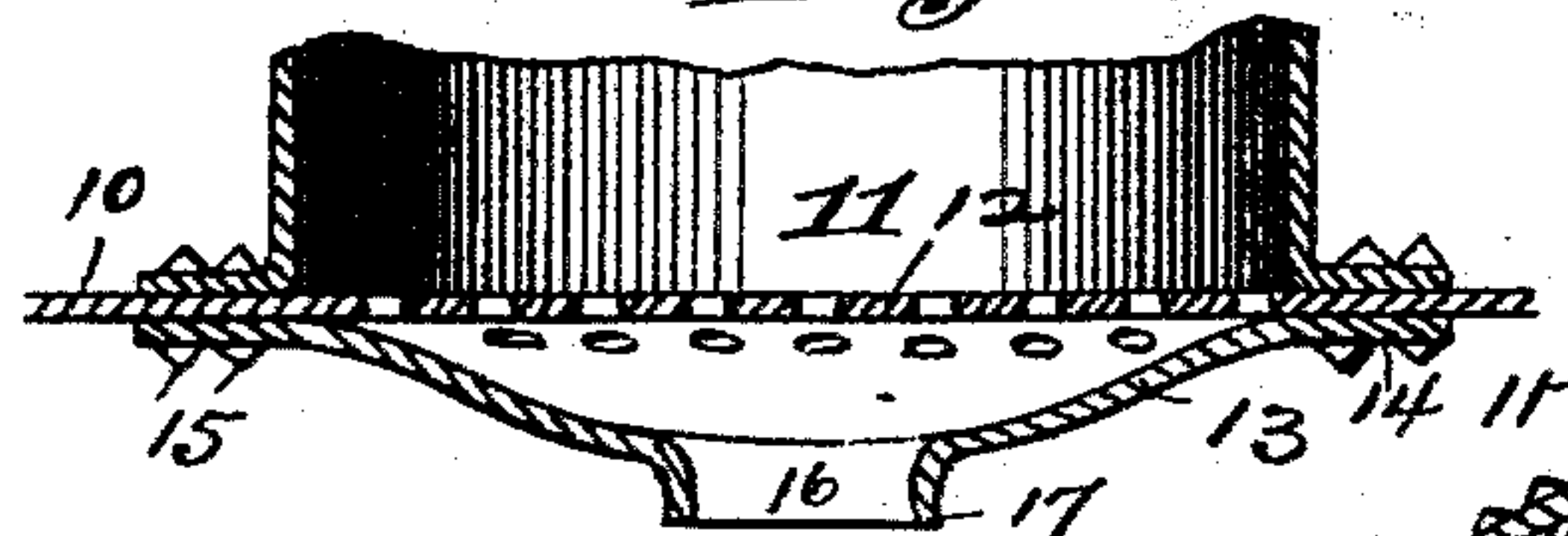


Fig. 5.

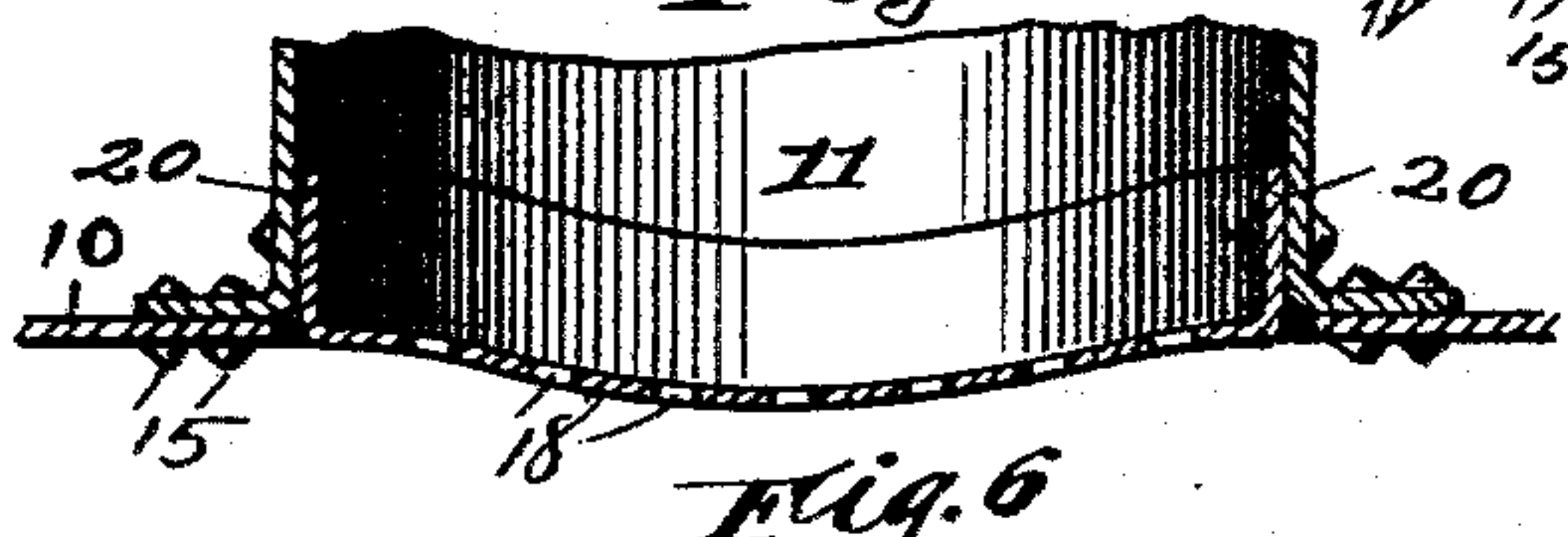


Fig. 6.

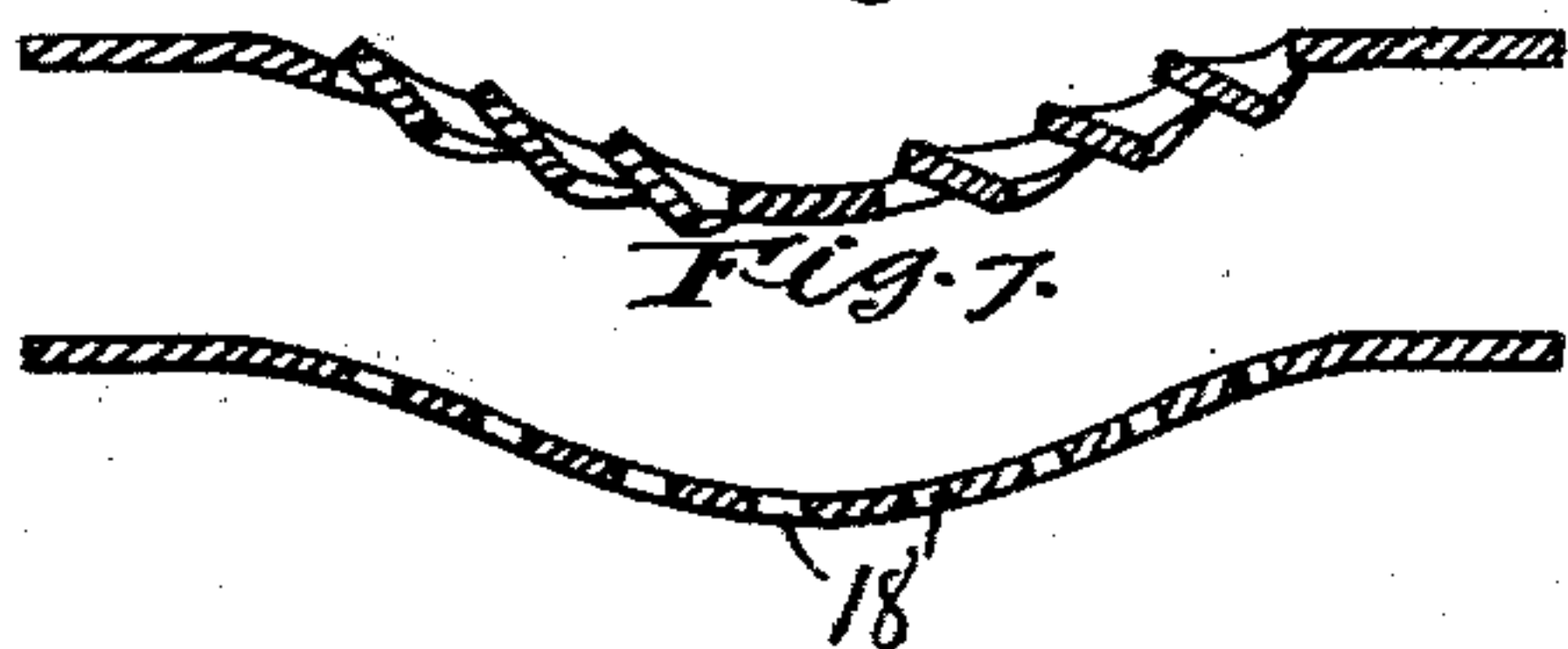


Fig. 7.

Fig. 8.

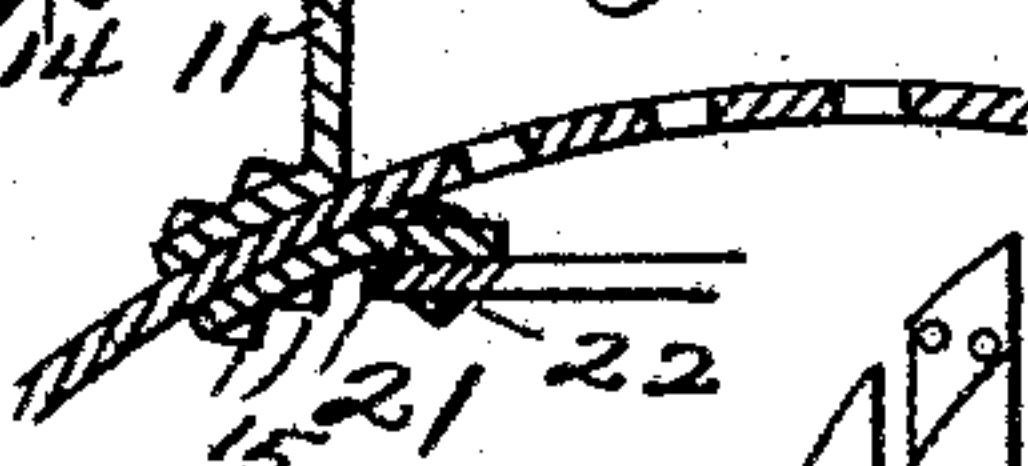


Fig. 3.

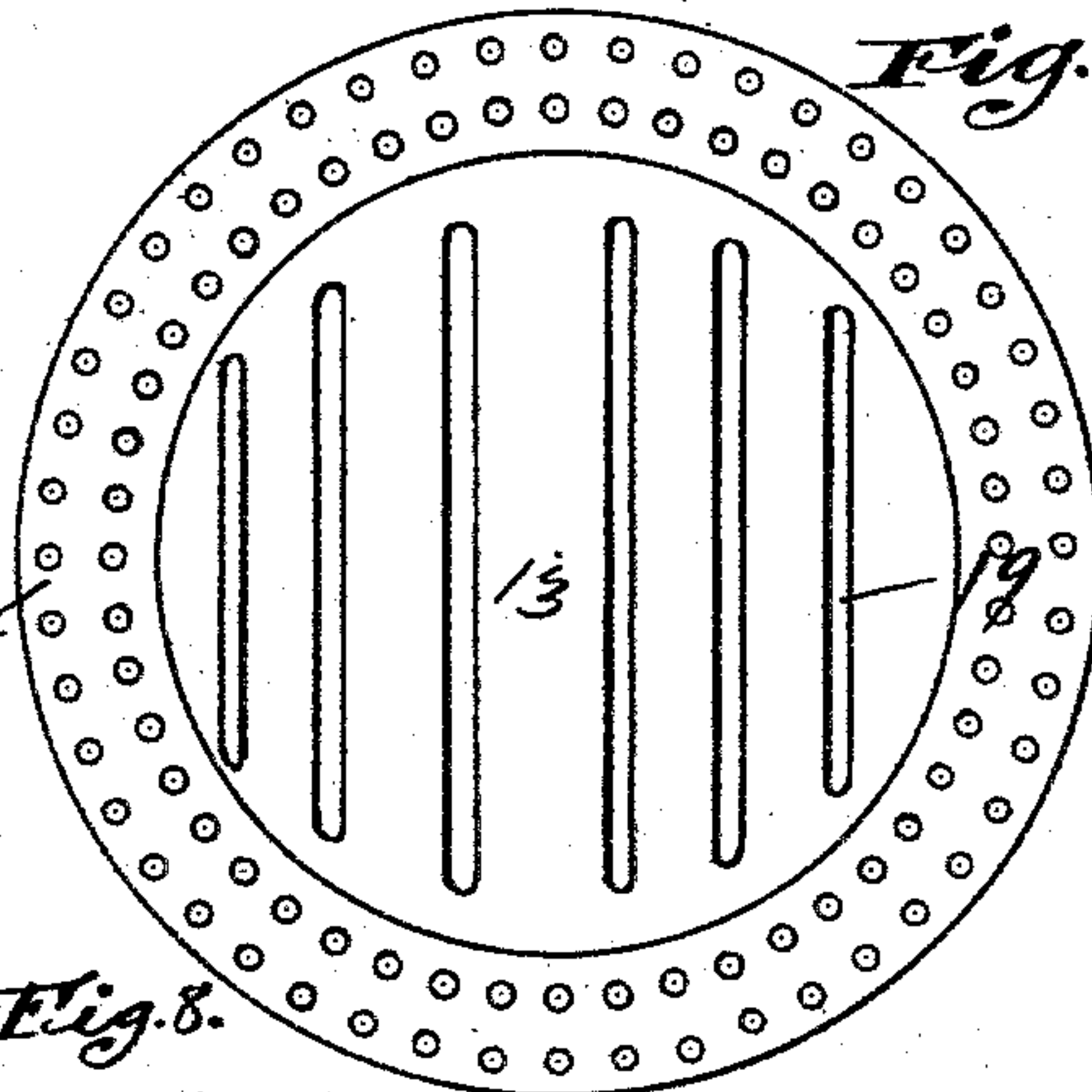


Fig. 9.

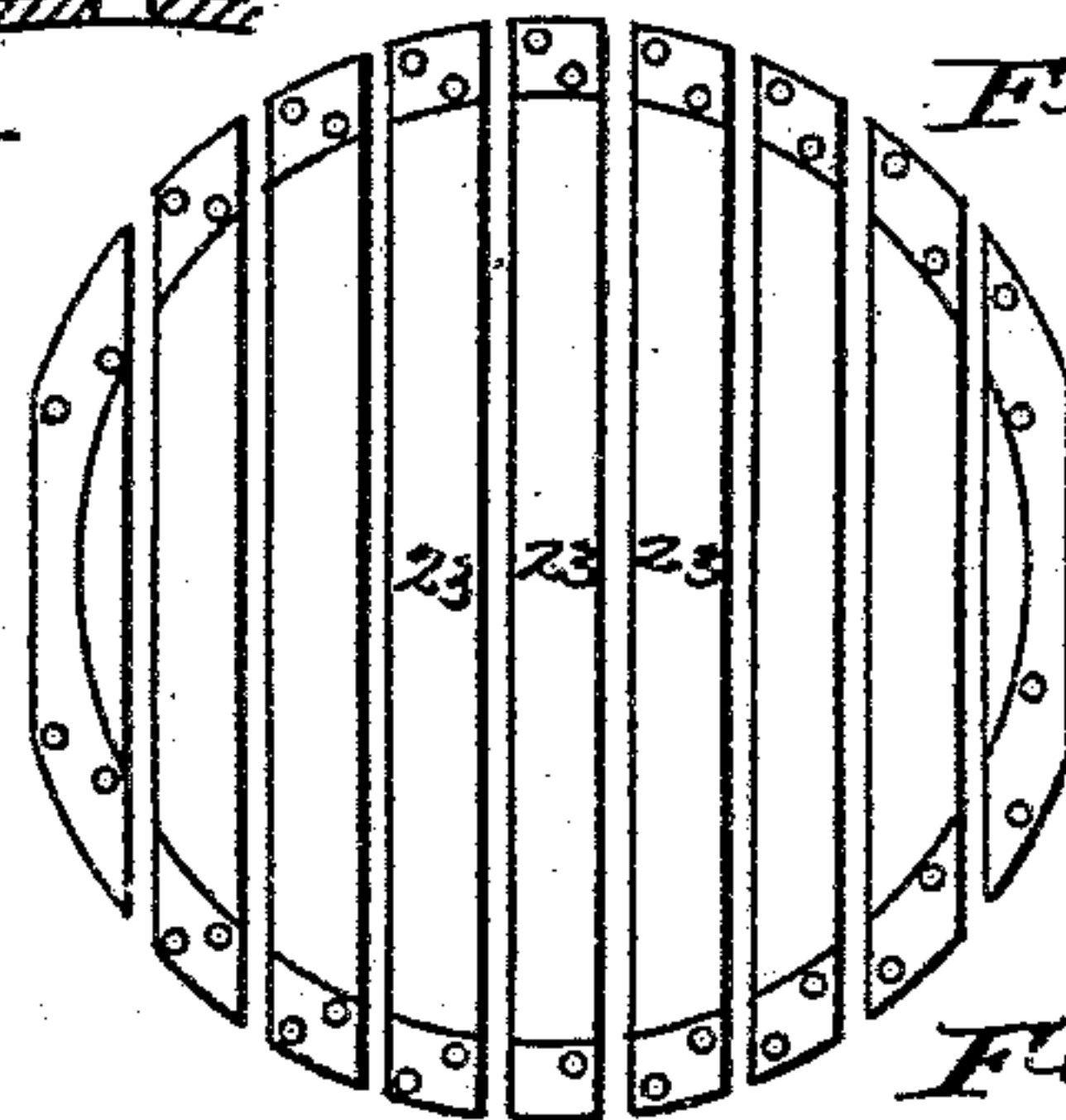
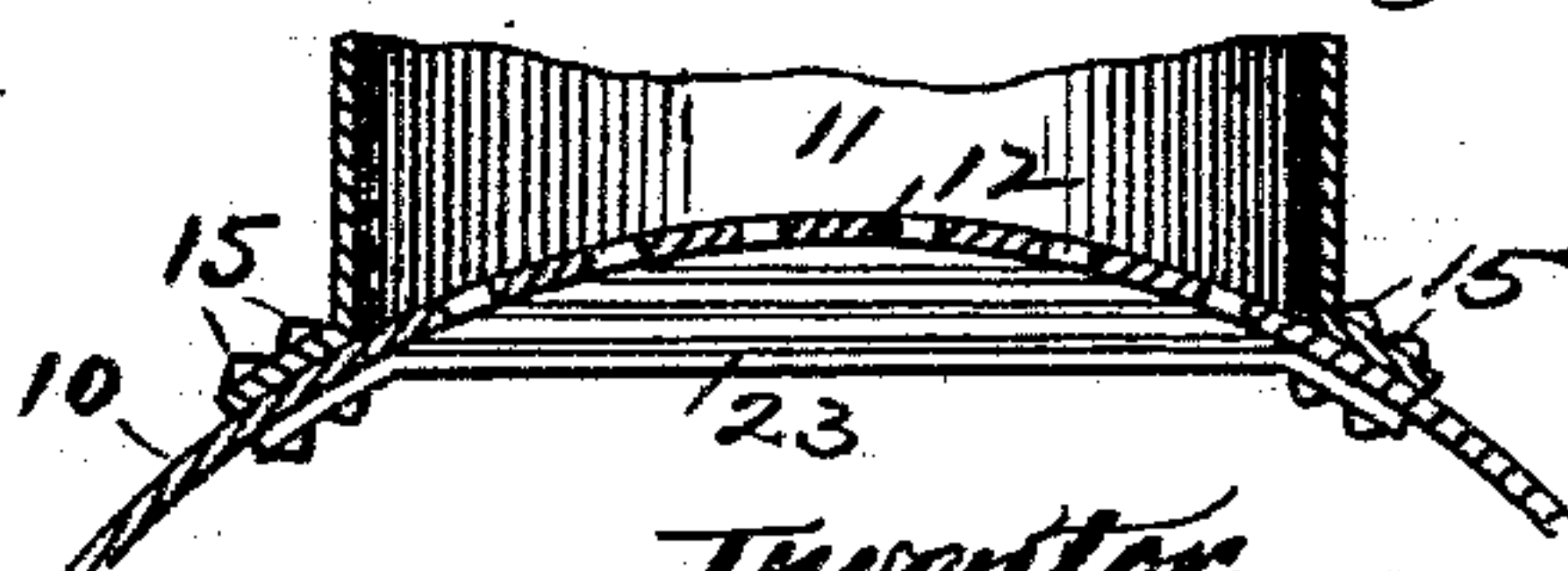


Fig. 9a.



Witnesses,
J. D. Mann.
Frederick Goodwin.

Inventor,
Edward T. Sederholm
By field, Towle & Lathrop,
attys.

UNITED STATES PATENT OFFICE.

EDWARD T. SEDERHOLM, OF CHICAGO, ILLINOIS.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 548,664, dated October 29, 1895.

Application filed July 22, 1895. Serial No. 556,692. (No model.)

To all whom it may concern:

Be it known that I, EDWARD T. SEDERHOLM, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification.

My invention relates to that class of steam-boilers which are provided with a dome, and the object of the invention is to improve the construction of such boilers by strengthening the shell at that portion which is weakened by the application of the dome.

Boilers of the class above mentioned have, usually, cylindrical shells, and the dome is also cylindrical in form and is applied to the top of the shell, and a circular section of the boiler is either perforated for the admission of steam to the dome or else such section bounded by the base is removed. In either case the boiler-shell is considerably weakened. Where the shell is perforated, the steam-pressure is equal above and below and the latter loses its distinctive feature of a pressure-resisting shell and becomes merely a curved brace. Where a portion of the shell is removed, there is no bracing to resist the steam-pressure, except such as results from the connection of the base to the shell around the opening, and the strain therefore tends to distort the base and the boiler will not stand the full pressure which it otherwise would. Various expedients have been tried for overcoming this weakness, such as the employment of annular flanged braces of various forms secured to the shell and base of the dome concentric to the opening.

My invention consists in a brace which is secured to the shell or dome, or both, and extended across the opening so as to span or bridge such opening, and thereby afford a boiler provided with a dome and capable of withstanding as high a pressure as a boiler without a dome.

In the accompanying drawings, Figure 1 is a transverse sectional elevation. Fig. 2 is a longitudinal sectional elevation through the boiler, dome, and brace. Fig. 3 is a plan view of the brace shown in Fig. 1; and Figs. 4 to 9, inclusive, are details showing modifications

in the form of the brace and the method of application.

In the drawings, 10 represents the shell of a boiler of the ordinary tubular construction and to which is applied the dome 11. As shown in Figs. 1, 2, and 4, the perforated portion of the dome (marked 12) is not removed, being utilized as a longitudinal brace. Below said perforated portion 12, I apply a brace 13, which is dished longitudinally, as shown in Fig. 2, and having a marginal flange 14 drooped or bent so as to conform to the curvature of the shell, to which it is secured by rivets 15 passing through the flange of the dome 11. A transverse cross-section of this brace presents a straight line, while in longitudinal cross-section it is downwardly curved, as will be apparent from Figs. 1 and 2, respectively. The extent of curvature depends upon the relative size of the dome and boiler. The brace, therefore, by reason of its form, is adapted to resist transverse strains without bending or buckling the metal, as occurs with the perforated portion of the boiler itself, which portion, being curved, retains but little strength to resist such lateral strains. This brace must, of course, be perforated to permit the passage of steam to the dome, and these perforations may be variously formed.

As shown in Figs. 1, 2, and 6, the body of the metal forming the brace is transversely slitted and the strips 13^a of the metal between the slits slightly twisted, so as to provide openings for the passage of the steam.

As shown in Fig. 4, the brace has a single central aperture 16, which may be bounded by the downwardly-turned marginal flange 17 to compensate in strength for the cutting away of the metal to provide the aperture.

As shown in Figs. 5 and 7, small apertures 18, of any desired form, are provided throughout the body of the plate, preferably being small in size, and the necessary area of opening provided by increasing the number of such openings. These openings may take the form of transverse slots, as shown at 19, Fig. 3. The brace may be secured to the shell or dome, or to both. In the construction shown in Figs. 1, 2 and 4 the brace is so connected by rivets passing through the flanges of the

brace and dome and through the shell at the margin of the perforated portion.

As shown in Fig. 5, the brace has an upwardly-turned flange fitting within and riveted to the base of the dome, as shown at 20.

In Fig. 8 an annular rivet-flange 21 is secured with the shell and base of the dome and has an inwardly-projecting portion, to which the straight margin of the plate is riveted or bolted, as shown at 22.

In Figs. 9 and 9^a I have shown a brace composed of a series of plates or bars 23, having their ends adapted for securement to the shell or dome and their body portions extending in the direction of the transverse axis of the shell and separated from each other to provide spaces for the passage of the steam. This construction may be preferred on account of economy in the material employed.

Other variations in the shape of the brace or form of the apertures and the method of securing the brace in position may be made, and I therefore do not limit my invention to these precise structural details.

In all of the forms of construction presented the effective strength of the parts is materially increased by the provision of the brace, which is so disposed as to attain the greatest strength of the metal in the resistance of transverse strains in the boiler.

I claim—

1. In a boiler of the class described, the combination with the shell and dome of a brace spanning the opening at the base of the dome and said brace having a body portion any transverse section of which is substantially parallel to the transverse axis of the shell, substantially as described.

2. In a boiler of the class described, the combination with the shell and dome, of a brace spanning the opening in the shell at the base of the dome and secured at its margins to the shell and provided with openings for the passage of steam, said brace having its body of such form and so disposed that any transverse section thereof is substantially parallel to the transverse axis of the shell, substantially as described.

3. In a boiler of the class described, the combination with the shell and dome, of a brace having a flanged margin angularly disposed with reference to its body and secured to the shell at the base of the dome and said body spanning the opening, provided with perforations and curved longitudinally of the shell, substantially as described.

EDWARD T. SEDERHOLM.

Witnesses:

C. C. LINTHICUM,

FREDERICK C. GOODWIN.