

(No Model.)

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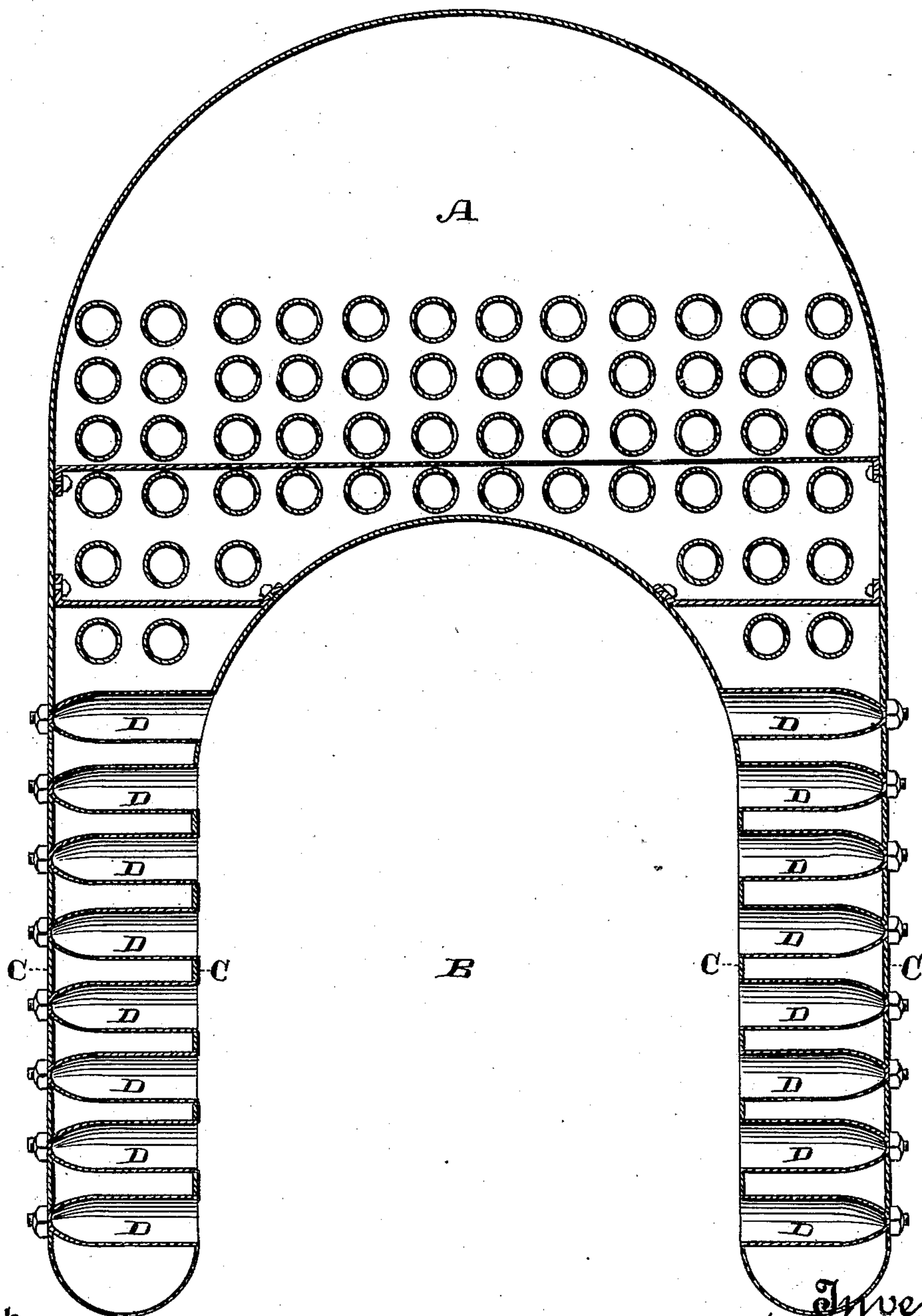
W. KINCAID.

STEAM BOILER.

No. 308,677.

Patented Dec. 2, 1884.

FIG. 1.



Witnesses,
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FIG. 2.

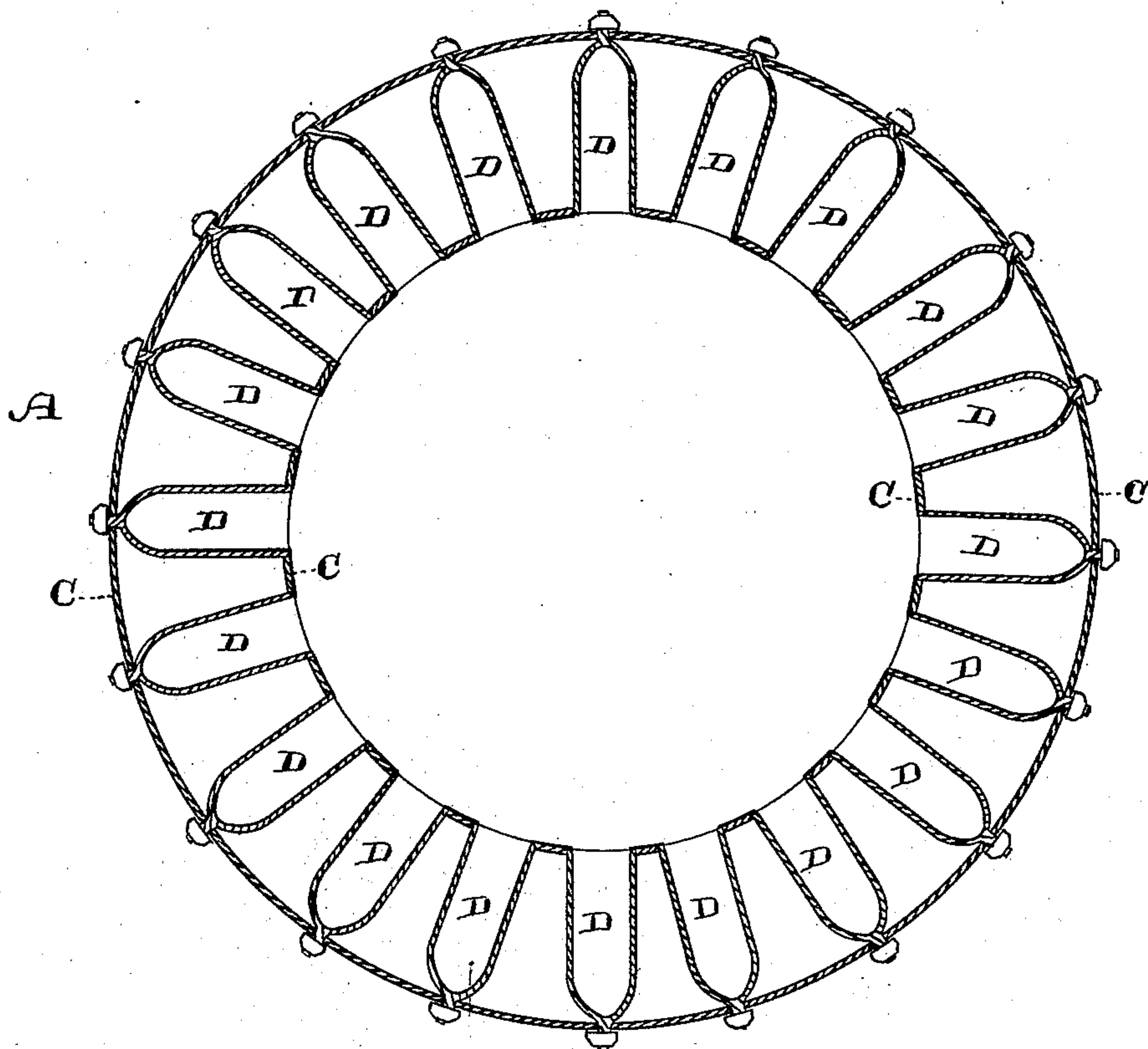
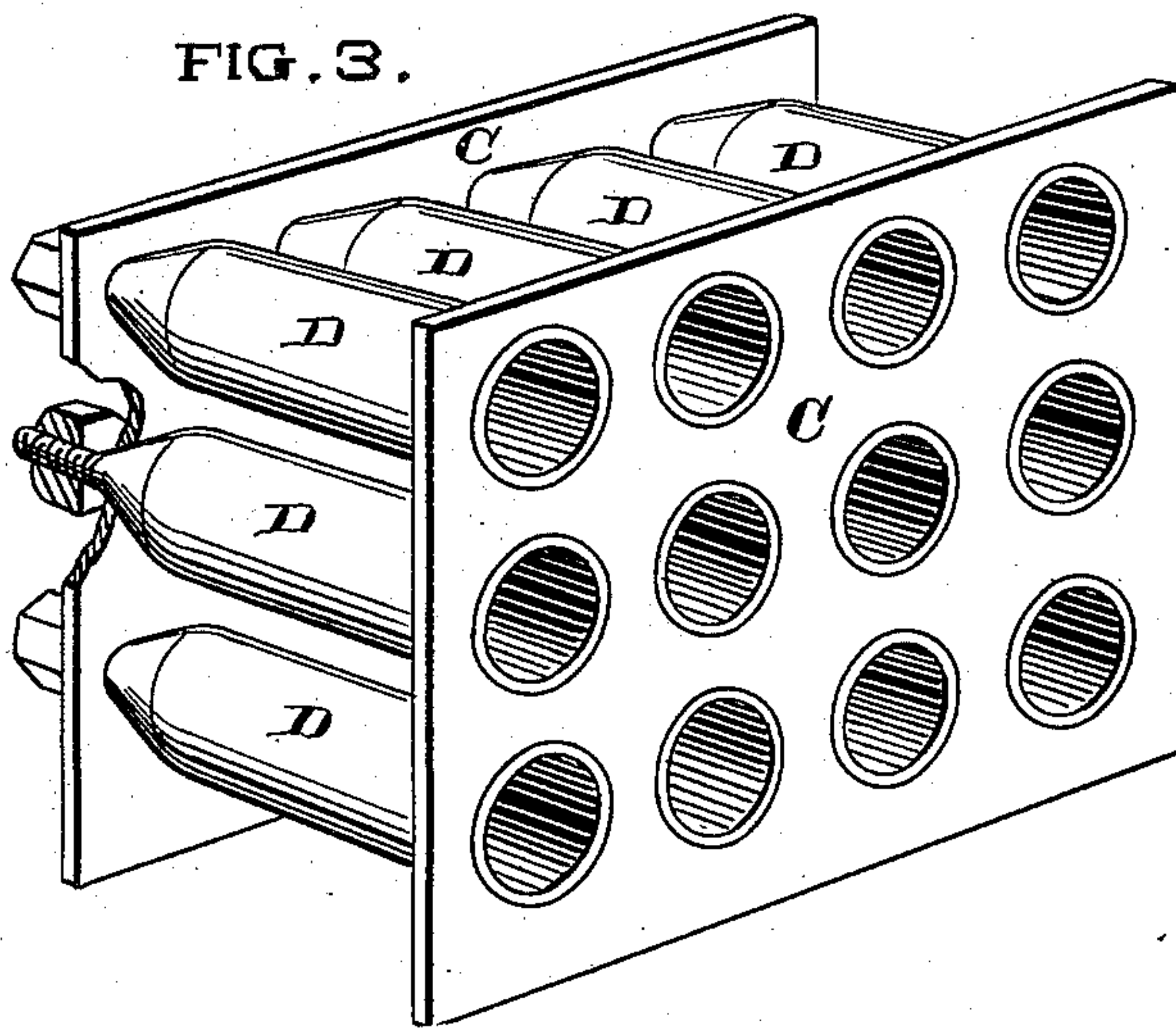


FIG. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM KINCAID, OF OAKLAND, CALIFORNIA.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 308,677, dated December 2, 1884.

Application filed September 26, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM KINCAID, of Oakland, in the county of Alameda and State of California, have invented an Improvement in Steam-Boilers; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to certain improvements in steam-boilers or apparatus for heating water; and it consists of a series of short tubes closed at one end and open at the other. These tubes are used in connection with the double walls or water-legs of boilers, the open ends opening through the inner wall into the furnace or fire-box, while the rear or closed ends have bolts extending outward from them and through the outer wall, so as to form stays for holding the walls in place, as well as providing an extra heating-surface.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a view showing my invention applied to a horizontal boiler. Fig. 2 shows its application to a vertical boiler. Fig. 3 shows a part of the boiler in perspective with the tubes.

A is a boiler having a furnace or fire-place, B, which may be constructed in the usual or any suitable manner, and C C are the walls forming the water-leg, which extends down around or along the sides of the furnace, according to its shape. Through the inner wall, C, holes are made of sufficient size to receive the inner ends of short tubes D, which are secured in the manner usual for securing flues and making them water-tight. The opposite or outer ends of these tubes are tapered and closed, having screw-bolts extending outward from them, as shown. The tubes when in place are of sufficient length to extend across

the water-leg from the inner to the outer walls, and the latter are perforated with holes of sufficient size to allow the screw-bolts to pass through them. Nuts are then applied to the outer ends of these screw-bolts and screwed up tight against the outer walls, thus holding the two walls rigidly with relation to each other, and each tube serves two purposes: first, by presenting its open end toward the fire in the furnace it provides a considerable increase in the heating-surface, around which the water circulates between the sides of the water-leg; and, secondly, the tubes themselves, by reason of the bolts at the rear and being secured to the inner wall, serve as stay-bolts to hold the walls rigidly in place and prevent their spreading under the pressure which may be brought upon them. By this construction I am enabled to do without any stay-bolts between the tubes, and the spaces between them are conveniently accessible for cleaning purposes when necessary.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

In a steam-boiler, a water leg or space surrounding the furnace or fire-place having inner and outer walls, together with short tubes extending transversely from the inner to the outer wall, their inner ends being opened toward the furnace, while the opposite ends are closed and provided with extensions or bolts which pass through the outer wall, where they are secured, substantially as herein described.

In witness whereof I have hereunto set my hand.

WM. KINCAID.

Witnesses:

S. H. NOURSE,
H. C. LEE.