

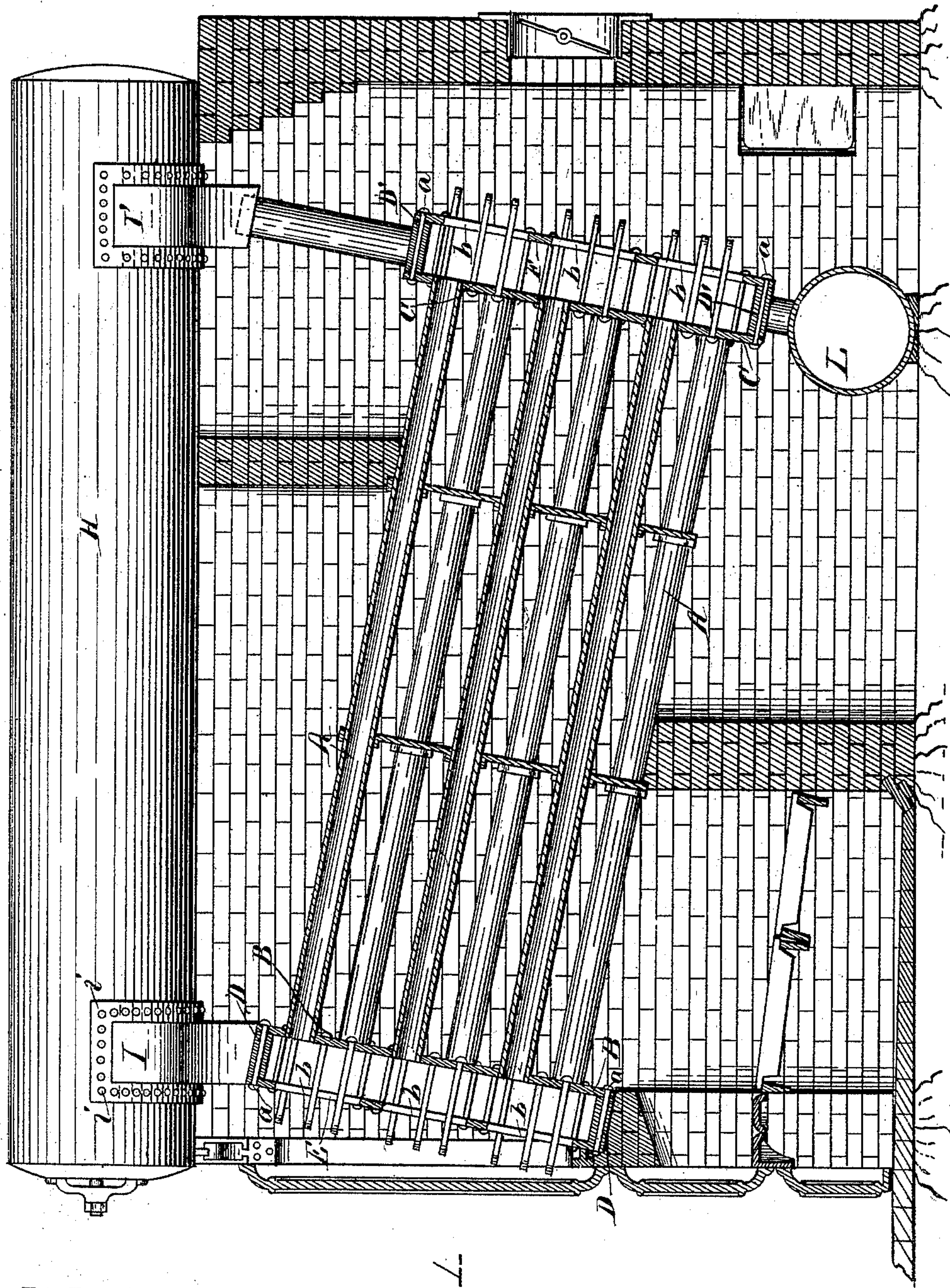
(No Model.)

2 Sheets—Sheet 1.

S. A. PRATT.
WATER TUBE BOILER.

No. 495,682.

Patented Apr. 18, 1893.



WITNESSES.
R. J. Wheeler
C. B. Barnziger.

Fig. 1

INVENTOR.
Stephen A. Pratt
By Edgar S. Wheeler
att'y.

(No Model.)

2 Sheets—Sheet 2.

S. A. PRATT.
WATER TUBE BOILER.

No. 495,682.

Patented Apr. 18, 1893.

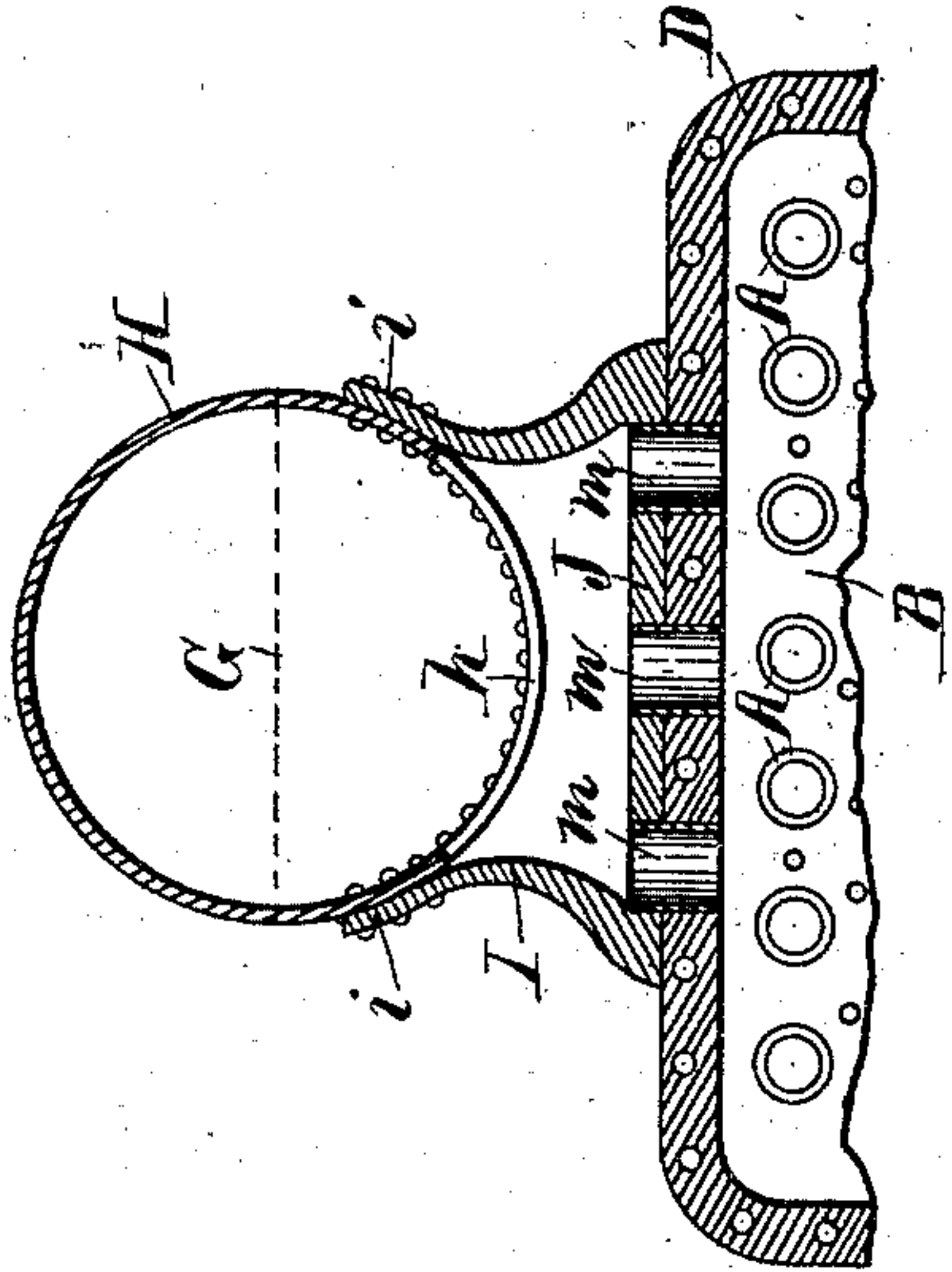


Fig. 4.

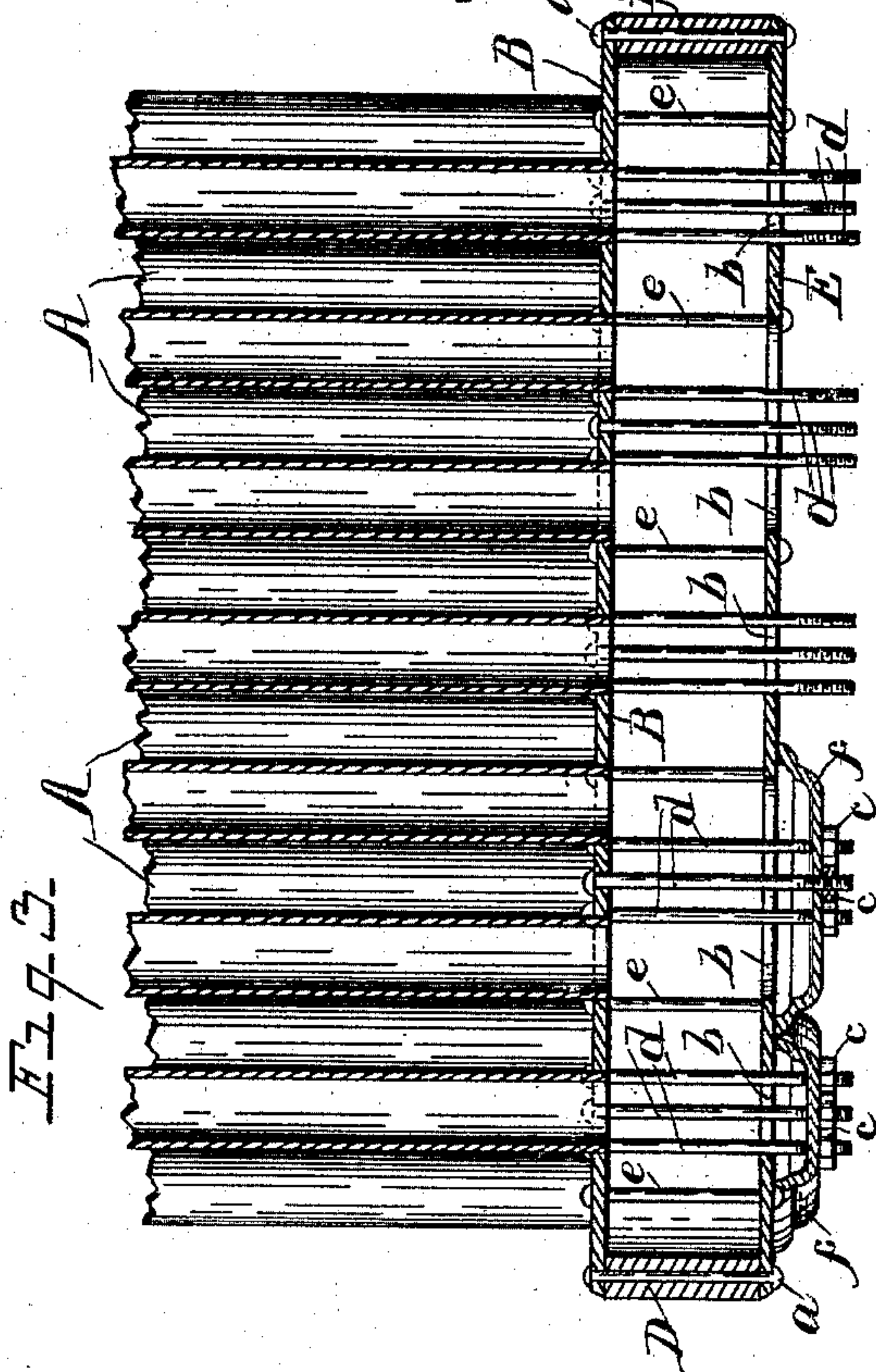


Fig. 3.

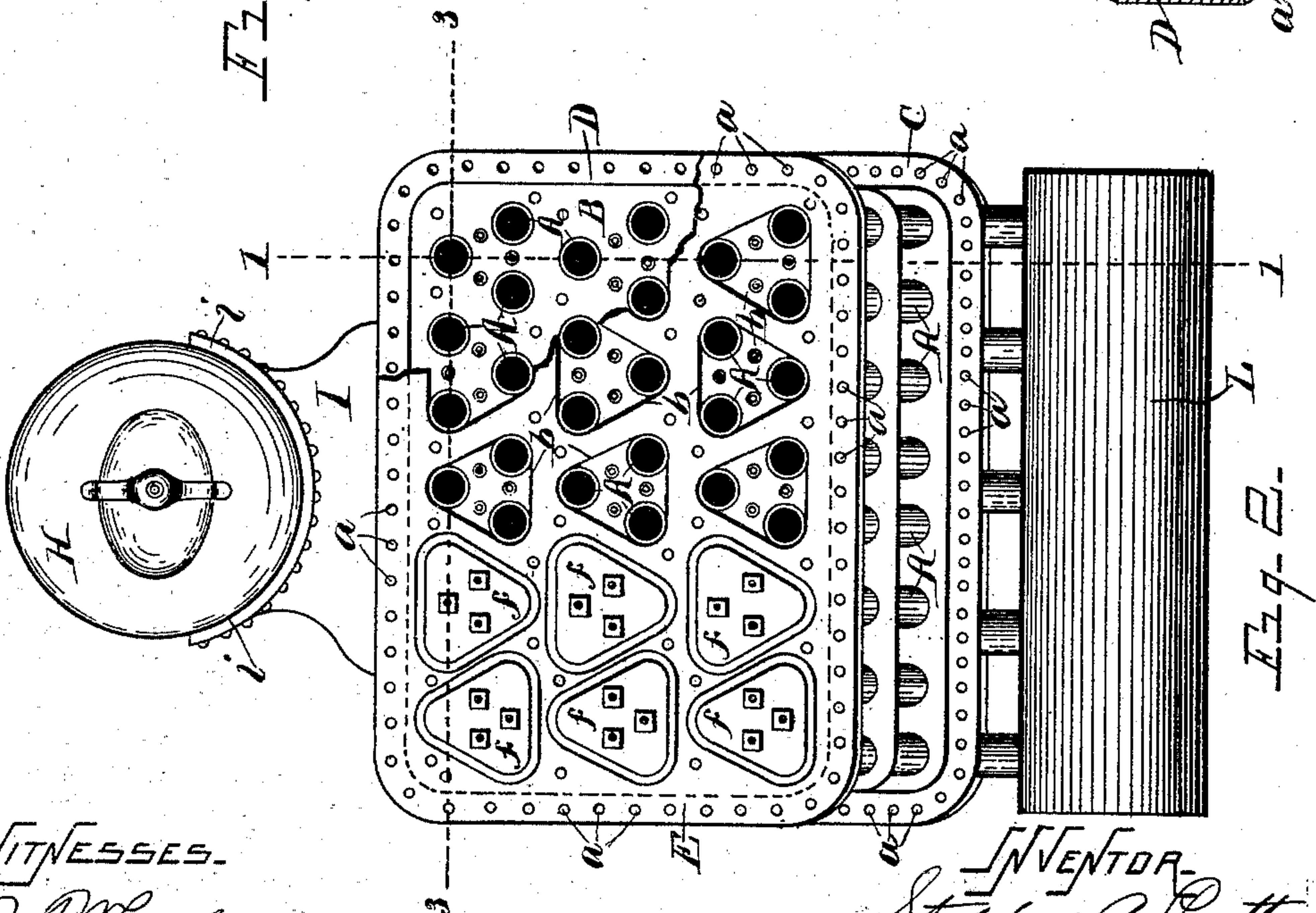


Fig. 2.

WITNESSES.

B. A. Wheeler
O. B. Baenziger.

INVENTOR.
Stephen A. Pratt
By Edgar S. Wheeler
att'y.

UNITED STATES PATENT OFFICE.

STEPHEN A. PRATT, OF DETROIT, MICHIGAN.

WATER-TUBE BOILER.

SPECIFICATION forming part of Letters Patent No. 495,682, dated April 18, 1893.

Application filed May 11, 1892. Serial No. 432,598. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN A. PRATT, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Water-Tube Boilers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in water tube boilers, and consists in a certain construction and arrangement of parts, as hereinafter fully set forth, the essential features of which being pointed out particularly in the claims.

The object of the invention is to produce a water-tube boiler, in which strength and durability are effected as well as economy in construction, and in which the water-tubes are made readily accessible for the purpose of cleaning or repair, and a perfect circulation of the water maintained within the boiler. This object is attained by the construction illustrated in the accompanying drawings, in which —

Figure 1 is a vertical longitudinal section through the boiler and inclosing brick-work, the boiler being sectioned as on dotted line 1—1 of Fig. 2. Fig. 2 is a front elevation of the boiler, showing some of the caps removed from the apertures in the outer plate of the boiler head, that command the ends of the tubes, and also showing a portion of said plate broken away. Fig. 3 is an enlarged horizontal section through the boiler as taken on dotted lines 3—3 of Fig. 2. Fig. 4 is an enlarged vertical section through the steam-drum and its connection with the water-front of the boiler.

Referring to the letters of reference, A indicates the tubes of the boiler, which are arranged alternately, and whose ends are expanded, at the front and rear, in the plates B and C respectively which form the inner

shells of the water space at the ends of the boiler.

Located adjacent to the plates B, C but separated therefrom by the dividing rings D, D', are the respective plates E, F, said plates being secured to said rings by means of the bolts or rivets *a* passing therethrough, as clearly shown in Figs. 1 and 3, and are provided with a series of triangular apertures *b* located directly opposite and commanding the ends of the water tubes A, in series of three, clearly shown in Fig. 2, said apertures being covered with the triangular caps *f* secured in place by the stay bolts *d* that are anchored in the inner plate B, C and which pass through said caps and receive the nuts *c*. These bolts *d* not only serve to secure the caps *f*, but assist in staying the plates B, C which are additionally stayed by the interposed bolts *e* crossing transversely between said plates. This formation and arrangement of parts produces a water space at both ends of the tubes A with which all of said tubes communicate, and renders either end of said tubes readily accessible by the removal of the cap from the opposed aperture in the outer plates.

H designates a steam-drum, which is located above the tubes of the boiler and communicates therewith through the water-front and water-back, the communication at the front being effected through the hollow cast coupling I, which is concaved at its upper end to receive the steam-drum H which lies therein, said coupling having the extending flange *i* through which it is riveted to the shell of said drum, whose lower arc is provided with an oblong aperture *h*, as shown in Fig. 4, that opens into the hollow of the coupling. The base J of said coupling rests upon the ring D apertured to receive the nipples *m* which pass therethrough and through said ring, as also shown in Fig. 4, whereby communication is established between the steam-drum and the water-front of the boiler.

The rear connection between the steam-drum and the water-back is accomplished in the same manner through the employment of a like coupling I' which communicates with the water-back through the tube or tubes K,

as shown in Fig. 1, by which means a perfect and unimpeded circulation is effected through the water tubes and the steam-drum of the boiler, which as will be understood are filled
5 with water, the normal water line being at the horizontal diameter of the steam drum, as shown by dotted line G in Fig. 4.

L indicates the mud-drum which is located below the water-back and connected directly
10 therewith.

While I have shown and described the removable caps *f* as triangular in form and as covering or commanding the ends of the water tubes in series of three; it is evident that
15 the number and location of the tubes in the boiler will determine the size and shape of said caps. They may be made to command four or more tubes or even less than three, if desired. As shown in Fig. 1, the boiler tubes
20 are located obliquely within suitable brick-work, above which the steam-drum is supported in a horizontal position.

Having thus fully set forth my invention, what I claim as new, and desire to secure by
25 Letters Patent, is—

1. In a boiler the combination of the tubes, the adjacent plates forming a water space with which said tubes communicate, the outer plate having a series of angular apertures
30 therein each of said apertures being opposite and commanding the ends of a plurality of said tubes, the angular caps adapted to independently close each of said apertures, and

being removably secured in place the stay bolts secured in the inner plate and passing
35 through said caps, substantially as specified.

2. In a boiler, the combination of the tubes, the outer and inner end plates, the interposed ring to which said plates are secured forming a water space with which said tubes commu-
40 nicate, the outer plate having a series of apertures therein each of said apertures being opposite the ends of a plurality of said tubes, the removable caps covering said apertures, the transverse stay bolts anchored in the in-
45 ner plate and passing through said caps to retain them in place, substantially as specified.

3. In a boiler, the combination of the alternating tubes, the adjacent plates and interposed ring forming a water-space with which
50 said tubes communicate, the outer plate having a series of angular apertures therein arranged opposite and commanding the ends of a plurality of said tubes, the angular caps adapted to close said apertures, and the stay-
55 bolts passing through the inner plate and through said caps, whereby the caps are retained in place over said apertures, and said plates are stayed, substantially as specified.

In testimony whereof I affix my signature in
60 presence of two witnesses.

STEPHEN A. PRATT.

Witnesses:

E. S. WHEELER,
H. R. WHEELER.