

No. 657,906.

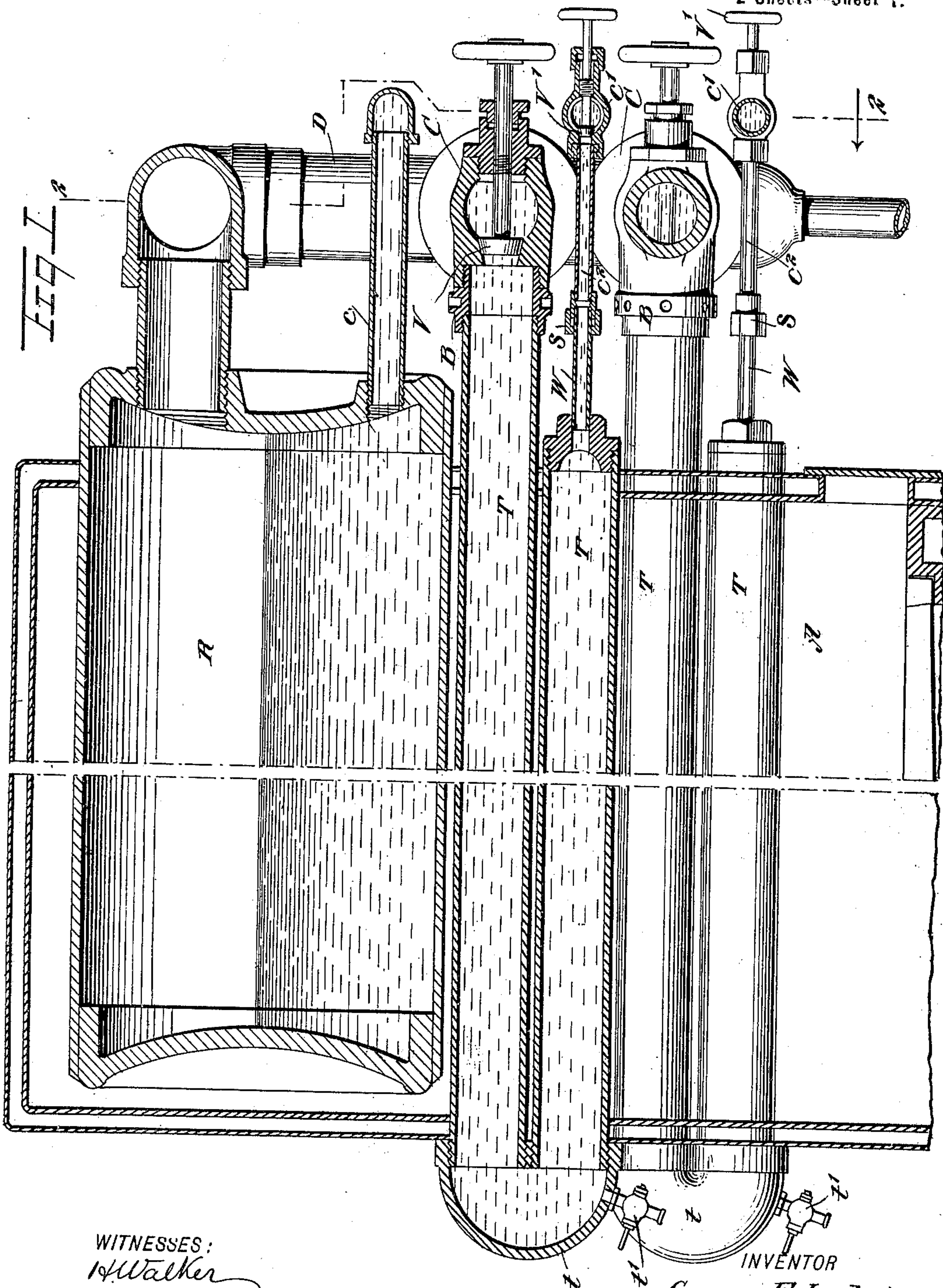
Patented Sept. 11, 1900.

G. E. LEDVINA.
BOILER.

(Application filed May 2, 1900.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

H. Walker
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INVENTOR

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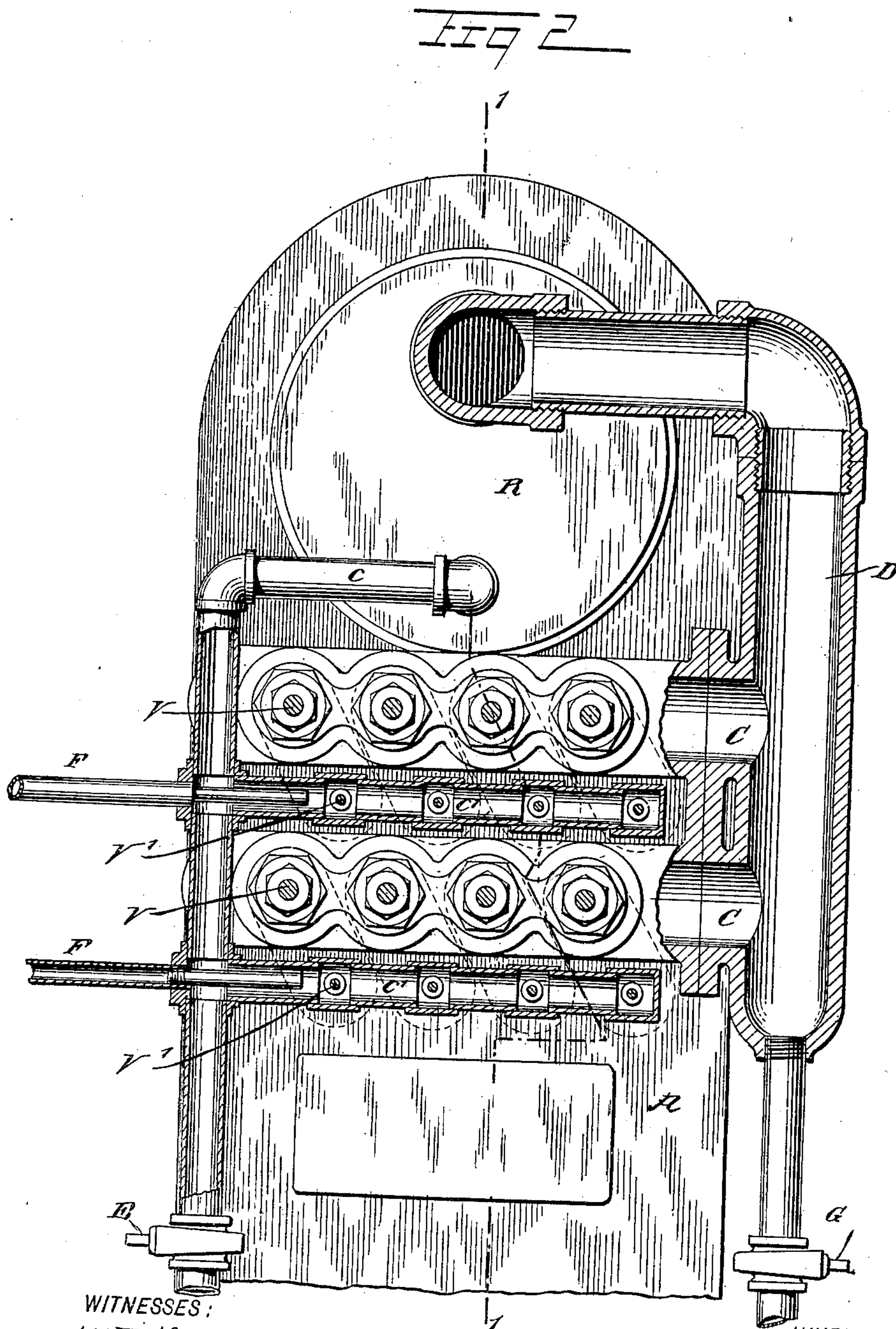
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UNITED STATES PATENT OFFICE.

GEORGE E. LEDVINA, OF NEW YORK, N. Y., ASSIGNOR OF ONE-FIFTH TO
HENRY FISCHER, OF MOUNT VERNON, INDIANA.

BOILER.

SPECIFICATION forming part of Letters Patent No. 657,906, dated September 11, 1900.

Application filed May 2, 1900. Serial No. 15,204. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. LEDVINA, a citizen of the United States, and a resident of the city of New York, (Stapleton,) borough of Richmond, in the county of Richmond and State of New York, have invented a new and Improved Boiler, of which the following is a full, clear, and exact description.

This invention relates to a boiler adapted especially for marine purposes; and the object is to provide a construction which may be readily repaired while the boiler is in use and without necessitating putting out the fires.

This specification is the disclosure of one form of my invention, while the claims define the actual scope thereof.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both views.

Figure 1 is a sectional view of the invention on the line 1 1 in Fig. 2; and Fig. 2 is a sectional view of the invention on the line 2 2 in Fig. 1, parts being shown in elevation, as indicated by the arrow on such line in Fig. 1.

The boiler has a fire-box A of any suitable form and employing any desired fuel. This fire-box incloses the boiler-tubes T and a drum R, which forms a steam-reservoir and may be constructed with a steam-dome and other appliances, as will be understood by persons skilled in the art. The tubes T are connected in pairs by elbows t, which pass outside of the walls of the fire-box A and which are provided with cocks t' for withdrawing the water from the pairs of tubes. In the drawings I have shown eight pairs of tubes T. These tubes are slidably mounted in the walls of the fire-box and have their front ends projected through the front wall of the fire-box, as shown. The drum R is also projected through the front of the fire-box. Passing from the drum R is a circulating-pipe c, which extends forwardly and then turns laterally and downward to communicate with two transversely-extending pipes c', which are one for each tier of pairs of tubes T. It will be seen that there are two tiers of these pairs of tubes. The pipes c' are fitted with rearwardly-extending tubes c², which are one for each pair of tubes T, and these tubes c² are provided at

their inner ends with packings S, in which tubes W are slidably fitted, such tubes communicating with the lower member of each pair of boiler-tubes T, the tubes W being fastened to the boiler-tubes, so as to move therewith. It will thus be seen that the tubes W are given a sliding connection with the tubes c², thus compensating for the relative expansion and contraction of these parts and also permitting of the withdrawal of the boiler-tubes from their operative positions, as will be fully described hereinafter. Valves V' are arranged in the pipes c', so as to respectively command the tubes c², and by closing any one of these valves the pipes c' may be shut off from the boiler-tube to which said valve is related.

The upper member of each pair of boiler-tubes T is joined by a right and left hand threaded union B, with return-tubes C. These return-tubes are, like the pipes c', one for each tier of pairs of boiler-tubes T. The return-tubes C are of greater capacity than the pipes c', so as to facilitate the passage of the steam therethrough, and these tubes C communicate with a collector-tube D, which passes back to the drum R to conduct the steam thereto. Valves V are placed in the return-tubes C and respectively command the pairs of boiler-tubes T, so that by closing these valves the communication of the boiler-tubes with the tubes C may be cut off. The feed-water is introduced into the boiler through pipes F, which pass into the lower branch of the water-circulating pipe c and respectively project into the pipes c'. By suitable controlling means the water-feed may be regulated according to the consumption of the water, as will be understood. The water passes from the drum R through the pipes c and c' and into the pairs of boiler-tubes, the water entering the lower member of each pair and passing therefrom through the upper member and into the return-tubes C and collector-tube D. The steam is generated in the tubes T, C, and D and passes therefrom into the drum R, which constitutes the-steam reservoir. Valves E and G may be placed, respectively, in the lower parts of the pipes c and D to close the same, and by a suitable arrangement of other valves the entire circulation in the boiler may be con-

trolled and the boiler may be blown out and manipulated in other respects, as will be understood by persons skilled in the art. I have not gone into the details of these features
5 for this reason.

In connection with this construction it is pointed out that each pair of boiler-tubes T forms in itself an independent section of the boiler and that any one of these pairs of
10 boiler-tubes may be readily withdrawn from the boiler without in any way interfering with the operation of the same or with the generation of steam by the other boiler-tubes. Assuming that in the operation of the apparatus one of the tubes T should become injured, the engineer has only to close the
15 valves V and V', which valves communicate with that pair of tubes T in which the injured tube is included. The cock t', which relates to this pair of boiler-tubes, should now be opened, so as to drain the water therefrom, and then by unscrewing the coupling B the pair of tubes may be drawn rearward out of
20 the boiler for repair or other purposes, as desired. When the valves V and V' are closed, the water and steam pass through the pipes c' and through the pipe c without hindrance of any sort, and the operation of the boiler goes on the same as before. It is for this reason
25 that my invention is especially adapted for marine purposes, for a complete breakdown in the boiler cannot occur with the construction which I have shown. The injury of one or two pipes will not materially interfere
30 with the steam-producing capacity.

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

1. A boiler, having a steam-reservoir, a circulating-pipe passing therefrom, a return-pipe passing thereto, the circulating and return pipes having orifices therein, a plurality of independent boiler-sections removably connected with the circulating and return
40 pipes and respectively communicating with the orifices therein, and independently-operative valves commanding the orifices in the circulating and return pipes.

2. A boiler having a steam-reservoir, a circulating-pipe passing therefrom, a return-pipe passing thereto, such pipes lying paral-

lel with each other and having orifices therein, independently-operative valves commanding such orifices, and independent boiler-sections each formed of two tubes connected with each
55 other at one end by an elbow, the other ends of the tubes being in communication with the respective orifices in the circulating and return pipes, and the tubes of said boiler-sections being removably connected with the
60 circulating and return tubes so that they may be independently removed from the boiler, as specified.

3. A boiler having a steam-reservoir, a plurality of independent boiler-sections each independently and removably connected with the steam-reservoir, a feed-water supply directing the feed-water to each boiler-section, and independent valves commanding the
65 respective boiler-sections and capable of operation to cut off such boiler-sections from the steam-reservoir and from the feed-water supply, whereby to permit the removal of any one of the boiler-sections from the boiler.

4. A boiler having a steam-reservoir, a number of independent boiler-sections each independently and removably connected with the boiler and communicating with the steam-reservoir, and valves commanding the
75 respective boiler-sections and capable of cutting off their communications with the steam-reservoir, whereby to permit the removal of any one of the boiler-sections from the boiler.

5. A boiler, having a steam-reservoir, a circulating-pipe passing from the same, a return-tube leading to the steam-reservoir, a plurality of boiler-sections each having two portions respectively removably connected with the circulating-pipe and return-tube so that
85 any one of the boiler-sections may be removed from the boiler, and valves working with the circulating-pipe and return-tube and movable to cut off the communications of such tubes with the boiler-sections, for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE E. LEDVINA.

Witnesses:

I. B. OWENS,

JNO. M. RITTER.