

(No Model.)

W. L. TOBEY.

STEAM BOILER.

No. 338,805.

Patented Mar. 30, 1886.

Fig: 1.

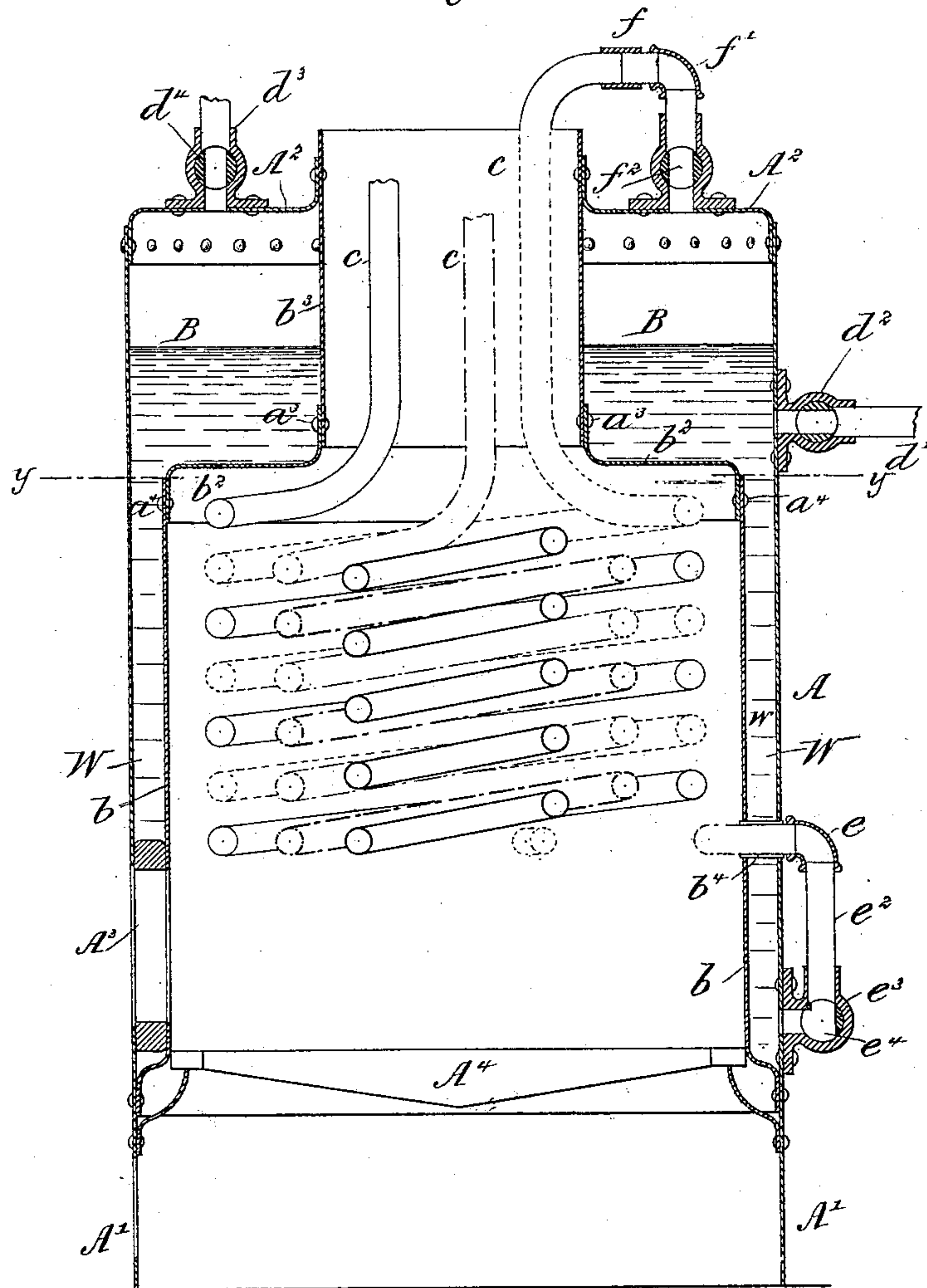
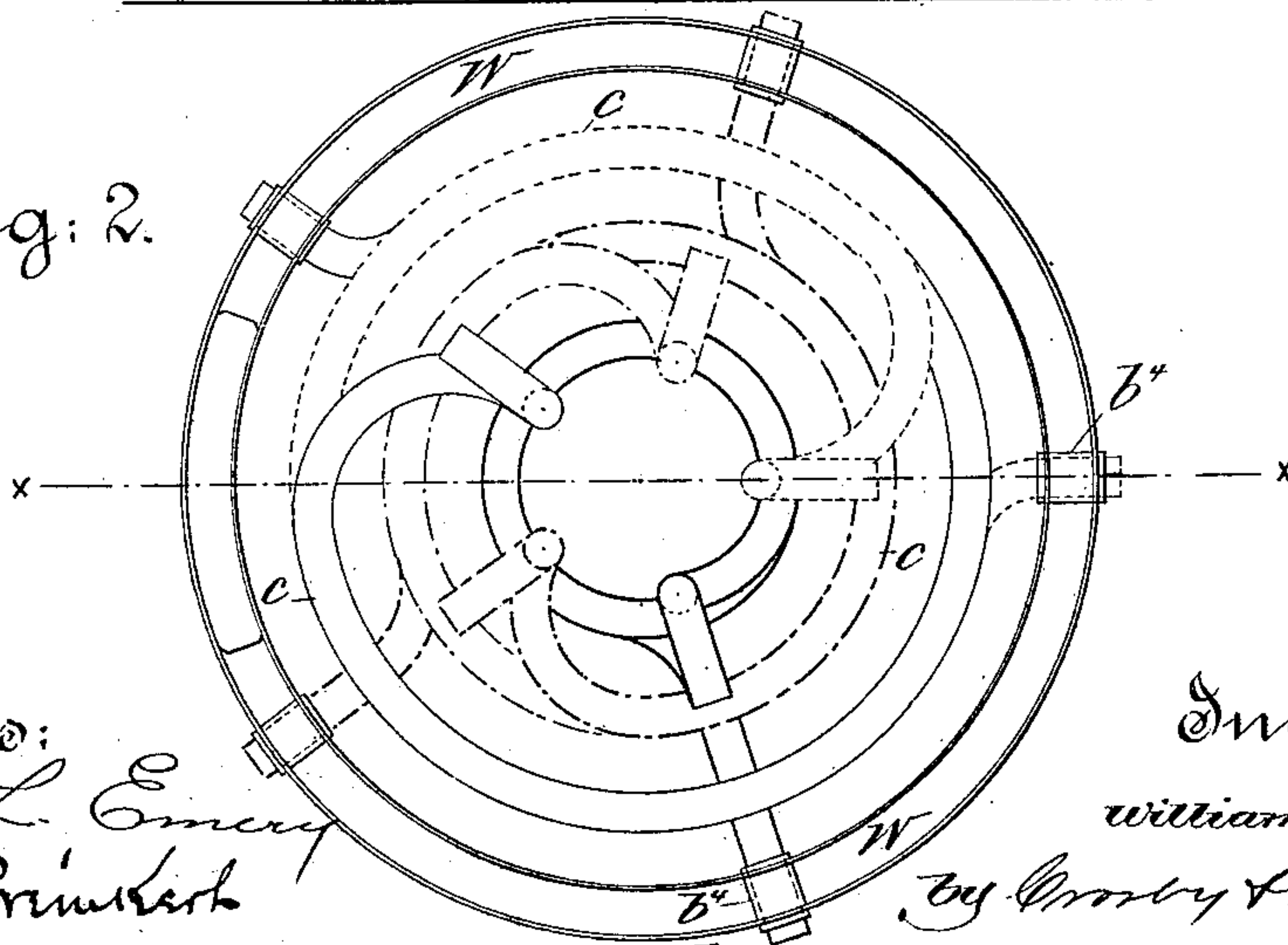


Fig: 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM L. TOBEY, OF BOSTON, MASSACHUSETTS.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 338,805, dated March 30, 1886.

Application filed August 31, 1885. Serial No. 175,757. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. TOBEY, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Steam-Boilers, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to boilers, and has for its object to construct a boiler which shall possess the distinctive advantages of the coil and tubular boilers, respectively, and at the same time be free from the disadvantages characteristic of each.

My invention consists of a wrought-metal fire-box surmounted by a wrought-metal jacket having a water and steam space above the fire-box and a water-space between its sides and the interior of the jacket, and one or more coils of pipe placed in the fire-box above its grate, and connected, respectively, with the water-space between the fire-box and jacket and with the steam-space referred to, the lower end of each of the said coils being preferably extended through sleeves placed in the fire-box and jacket, the said pipes being each connected by a short pipe outside the jacket with the lower part of the water-space between the fire-box and jacket. The pipes referred to contain suitable cocks, plugs, or valves, by which to cut the said pipes off from communication with the said water-space in case of injury to a coil.

Figure 1 is a vertical section of a boiler embodying my invention, the section being taken on the line *xx* of Fig. 2; and Fig. 2, a plan view of Fig. 1, with the boiler broken away on the line *yy*, showing the manner of connecting the coils.

The wrought-metal shell or jacket A, of suitable height and diameter, has preferably a base part, A', which jacket at its upper end is provided with a crown-sheet, A², and with an opening, A³, for fuel, the said opening being in practice covered by a suitable door, the base also in practice having a suitable door from which to take ashes which fall below the grate A⁴, of usual construction, supported upon usual lugs or projections secured to the base. This boiler sheet or jacket is provided internally with a fire-box, b, of sufficiently smaller diameter to leave a water-space, W,

or what may be called a "water-leg." The lower flanged end of the fire-box is riveted to the shell A. The fire-box, at a point below the crown-sheet A², has riveted to it at a⁴ a crown-sheet, b², the center part of which is cut out and flanged, and the said flange has riveted to it at a³ a flue, b³, thus leaving a steam and water chamber, B. The water leg or space between the circumference of the fire-box and shell is provided with one or more sleeves, b⁴, preferably made as short tubes, extended at each end to form the necessary sleeves and air-tight joint. Within the fire-box, and exposed to the fire, is placed one or more coils, c, preferably, however, a series of coils. The present drawings, in Fig. 2, show five coils, each of which at the lower end is extended through one of the sleeves b⁴ and joined outside of the shell A by suitable fittings, e, and pipe e² with the cock e³, it having a plug, e⁴, of usual construction, the said cock being in communication with the water-space W. The upper end of each coil, as shown by the coil c at the right of Fig. 1, after passing out through the flue b³, is returned and connected through suitable fittings, f f', with a cock, f², in communication with the steam-space B. The steam generated in the space B is taken therefrom for use through the pipe d³, which will have in it a cock or valve, d⁴, and the water to be heated for the generation of steam will be introduced by the pipe d', having a suitable cock, d².

In the operation of my improved boiler the water enters the water-space by the pipe d', passing therefrom through the cocks e³ into the lower ends of the coils c, and being heated therein the steam rising from the water passes into the steam-space B through the cocks f².

In case of accident—such as the bursting of one of the pipes—the cocks connecting it with the steam and water spaces may be closed and the generation of steam be continued through the remaining coils until the injury has been repaired, this feature of not being obliged to stop the fire and remove the water being of very material advantage.

I am aware that coil-boilers have been constructed having the lower end of the coils therein connected to the inside casing or shell, the said coils communicating with the water-

space from the inside of the boiler; but this construction is objectionable, because of the great difficulty of repairs in case of leakage.

I am also aware that coil-boilers have been constructed wherein the upper end of the coils in the boiler have been projected into the steam-space of the said boiler between the outer and inner casing or shell.

I claim—

10 1. The combination, substantially as shown and described, of the shell A, being closed, fire-box *b*, the intervening water-space W, the steam-space B, and the series of coils of pipe *c*, connected at their lower ends by valves *e*¹ with the water-space, and extended up through the smoke-flue and connected to the steam-space at their upper ends by valves *f*², substantially as shown and described.

20 2. The fire-box *b* and the shell or jacket A surrounding it, leaving a water-space, W, between, and the cock or valve outside the shell and in communication with the said water-space, the pipe *e*² and the sleeve *b*⁴, extended through the fire-box and shell, combined with
25 a coil, *c*, of pipe, one end of which is extended through the said sleeve and opens into the said pipe *e*², the opposite end of the pipe after entering the flue being connected with the steam-space by a cock, whereby the said coil may be
30 cut off or rendered inoperative, substantially as described.

3. In a steam-generator, the wrought-metal case or shell and the wrought-metal fire-box therein shaped to leave a steam-space, B, and
35 water-space W, combined with one or more coils of pipe arranged in the fire-box above the grate and connected each at its opposite ends with both the said steam-space and the

said water-space by interposed valves, the ends of the coils connected to the steam-space being extended through the smoke-flue to the outside of the steam-space, and with connections to join the said ends to the outside of the steam-space, substantially as described. 40

4. In a steam-generator, a wrought-metal case or shell and a wrought-metal fire-box therein shaped to leave a steam-space, B, and water-space W, combined with one or more coils of pipe arranged in the fire-box above the grate and connected each at its opposite ends with both the said steam-space and the said water-space, the ends of the said coils connected to the water-space being extended to the outside of the water-space, and with connections to join the said ends to the outside of the water-space, substantially as described. 55

5. In a steam-generator, a wrought-metal case or shell and a wrought-metal fire-box therein shaped to leave a steam-space, B, and water-space W, combined with one or more coils of pipe arranged in the fire-box above the grate, and connected each at its opposite ends with both the said steam-space and the said water-space, the ends of the coils connected to the steam-space being extended through the smoke-flue to the outside of the steam-space, and with connections to join the said ends to the outside of the steam-space, substantially as described. 65

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses. 70

WM. L. TOBEY.

Witnesses:

G. W. GREGORY,
J. H. CHURCHILL.