(No Model.)

J. BARLET.

STEAM BOILER.

No. 462,613. Patented Nov. 3, 1891.

Fig. 2.

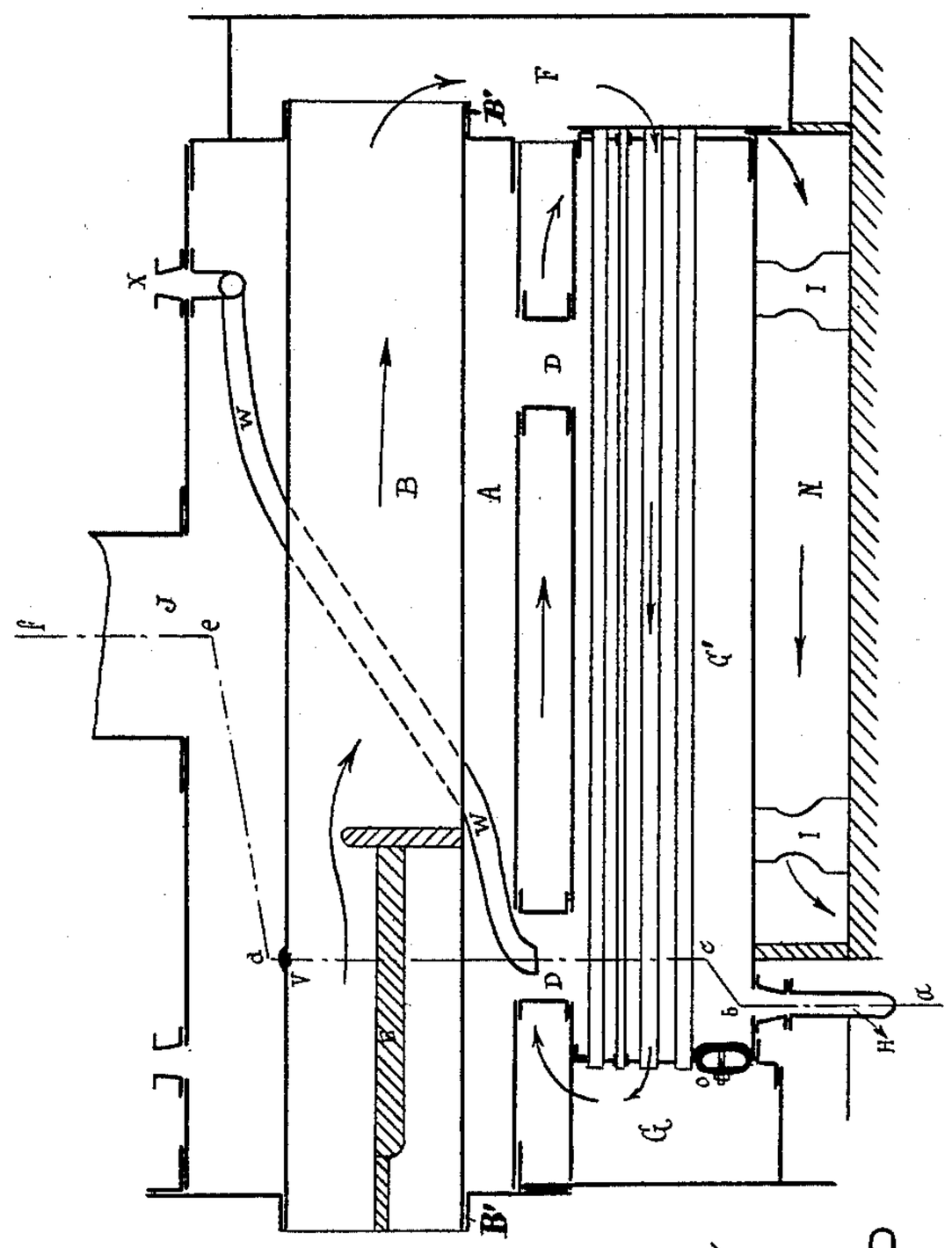
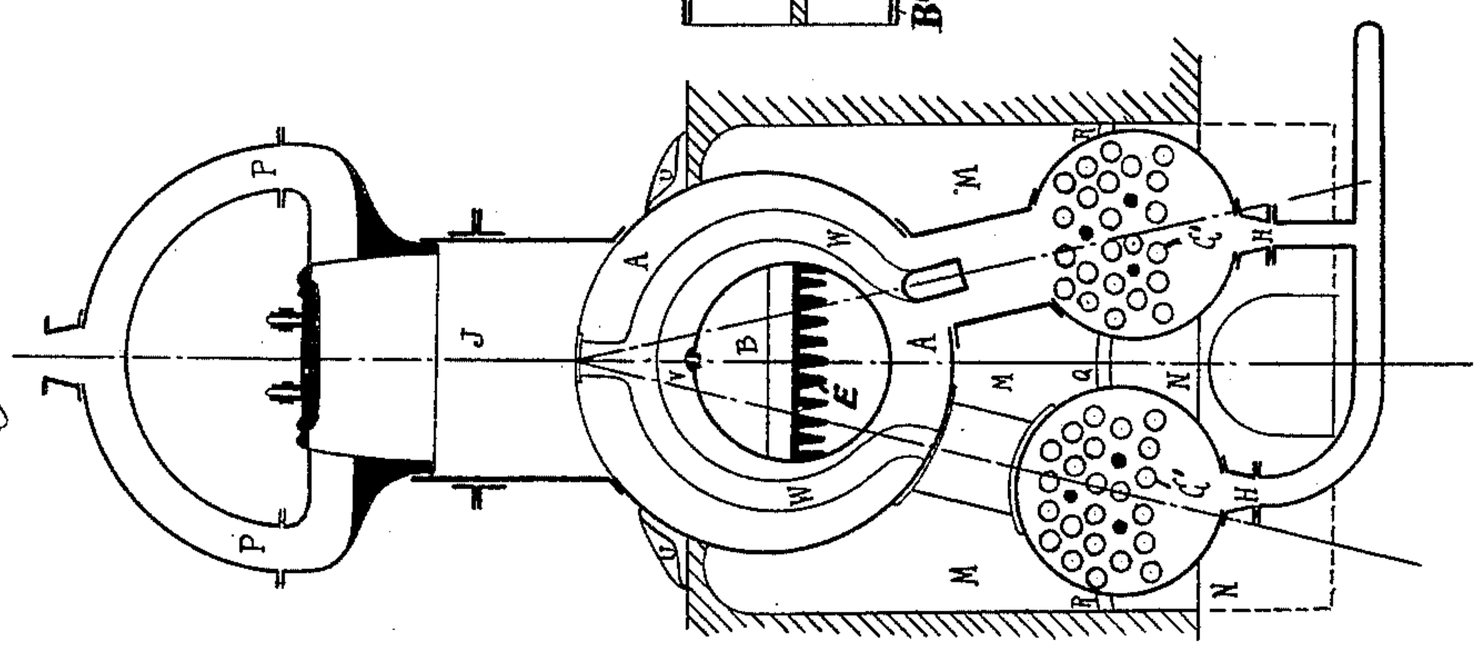


Fig. 1.



Witnesses:-
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UNITED STATES PATENT OFFICE.

JULES BARLET, OF VITRY-EN-ARTOIS, FRANCE.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 462,613, dated November 3, 1891.

Application filed January 2, 1891. Serial No. 376,443. (No model.) Patented in France June 21, 1890, No. 206,414.

To all whom it may concern:

Be it known that I, JULES BARLET, a citizen of the French Republic, residing at Vitry-en-Artois, Pas de Calais, France, have invented certain new and useful Improvements in or Relating to Steam-Boilers, (for which I have obtained Letters Patent in France, No. 206,414, dated June 21, 1890,) of which the following is a specification.

This invention relates to steam-boilers in which steam is generated partly by means of boiler-tubes or supplemental shells or boilers.

The invention consists in the construction, arrangement, and combination of parts, as hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims.

Figure 1 is a vertical transverse section, and Fig. 2 a vertical longitudinal section, of my boiler on line *a b c d e f* of Fig. 2.

The main body A of the improved boiler is connected with the boiler-tubes by four branch tubes D. The upper portion of the body is surmounted by a dome J, at the top of which there is a man-hole.

The cylindrical body is supported by preferably six side wings or brackets U, resting upon the masonry. The fire-grate E is arranged within the main body in a tube or flue B. It will be seen that the grate by simply resting within the tube B is adapted for ready removal through one end of the said tube. Above the grate there is a fusible plug V, the stopper or plug being preferably made of brass and recessed, the recess being filled with tin-solder. Under normal circumstances this plug is covered with water; but when the water-level sinks sufficiently to expose the plug to the action of the fire the solder melts, and thus admits steam, which, by rushing onto the flame, extinguishes it. To settle the boiler in operation again all that is necessary is to refill the recess of the plug with solder and admit a fresh supply of water to the boiler. The tube B, by resting at its ends within the cylindrical flange B′ of the end plates or headers of the boiler, renders said tube capable of removal from within the boiler. The lower boilers rest upon cast supports I and are internally provided with tubes G′ and closed by stayed tube-plates at either end. In the lower portion is provided a free space for cleaning purposes, as well as a man-hole. The entrance is at *o*, where an opening is provided, which under normal circumstances is closed by a safety-valve, such as is used in digesters. The tubes are expanded and protected against the action of the fire by a counter-plate. The blow-off pipes H, arranged at the front part of the masonry and at the lower portions of the boilers, enable the discharge to be effected without pressure. In front and behind the boiler-tubes are smoke-boxes F and G, which facilitate the circulation of the gases and afford access to the tubes and back part of the fire-box.

The operation is as follows: The gases arising from combustion pass through the first smoke-box F and the boiler-tubes and enter the second smoke-box G at the opposite end. They then rise between the boilers and the main body, and, owing to the arrangement of the deflecting walls or bridges R Q R, heat the upper portion of the boilers and the top of the main body M, whereupon they issue through the openings provided behind the said deflecting-walls and redescend to the space below the boilers, after heating the lower portion N of which they escape through the flue or chimney.

The feed-water is admitted into the upper part of the boiler through the opening X, and thence descends along the walls of the fire-box or flue by a bifurcated tube W and is discharged by the latter into the upright tubes at the front. The object of this arrangement is to heat the water by contact with the walls of the fire-box and to cause the impurities to be deposited in the vicinity of the discharge-cocks H, so that they can be readily carried away.

As the fire-box is only covered by a thin layer of water, the steam submitted to the practically direct action of the fire becomes superheated and gets rid of most of the water it contains. Steam is derived from the dome J through the pipes P, connected together at sufficient height above the dome not to interfere with the easy access to the man-hole.

I claim—

1. In a steam-boiler, the combination, with the main boiler A, provided with the internally-arranged fire-tube B, having a grate, of the supplemental boilers arranged below the

main boiler and in such positions relatively thereto as to leave a space between and around all said boilers, the short tubes D, connecting the water-space of the main boiler with the like spaces of the supplemental boilers, fire-tubes arranged within the latter boilers, smoke-boxes at each end of the latter and serving as a means of communication between the fire-tubes thereof and the fire-tube of the main boiler, and the feed-water pipe W, bifurcated and passing around the fire-tube of the main boiler and discharging into the water-space of the supplemental boilers, all said parts being arranged and combined for co-operation substantially as described.

2. In a steam-boiler, the combination, with the main boiler A, provided with the internally-arranged fire-tube B, the latter being adapted for removal through one end of the said boiler and provided with a grate, of the supplemental boilers arranged below the main boiler and in such positions relatively thereto as to leave a space between and around all said boilers, the short tubes D, connecting the water-space of the main boiler with the like spaces of the supplemental boilers, fire-tubes arranged within the latter boilers, smoke-boxes at each end of the latter and serving as a means of communication between the fire-tubes thereof and the fire-tube of the main boiler, and the feed-water pipe W, bifurcated and passing around the fire-tube of the main boiler and discharging into the water-space of the supplemental boilers, all arranged and combined for co-operation substantially as described.

3. In a steam-boiler, the combination, with the main boiler A, provided with the internally-arranged fire-tube B, having a grate, of the supplemental boilers arranged below the main boiler and in such positions relatively thereto as to leave a space between and around all said boilers, the short tubes D, connecting the water-spaces of the main and supplemental boilers, fire-tubes arranged within the latter boilers, smoke-boxes at each end of the latter and serving as a means of communication between the fire-tubes thereof and the fire-tube of the main boiler, the feed-water pipe W, bifurcated and passing around the fire-tube of the main boiler and discharging into the water-space of the supplemental boilers, and the blow-off pipes H, connecting the water-spaces of the supplemental boilers with each other near one end of the latter and in proximity to the discharge end of the water-pipe W, as described, for the purpose specified.

In witness whereof I have hereto set my hand in the presence of the two subscribing witnesses.

JULES BARLET.

Witnesses:
ANTOINE GENTZ,
EUGENE LOUIS JOSSERAND.