(No Model.)

T. L. & T. J. STURTEVANT.

BOILER.

No. 488,229. Patented Dec. 20, 1892.

Fig. 1.

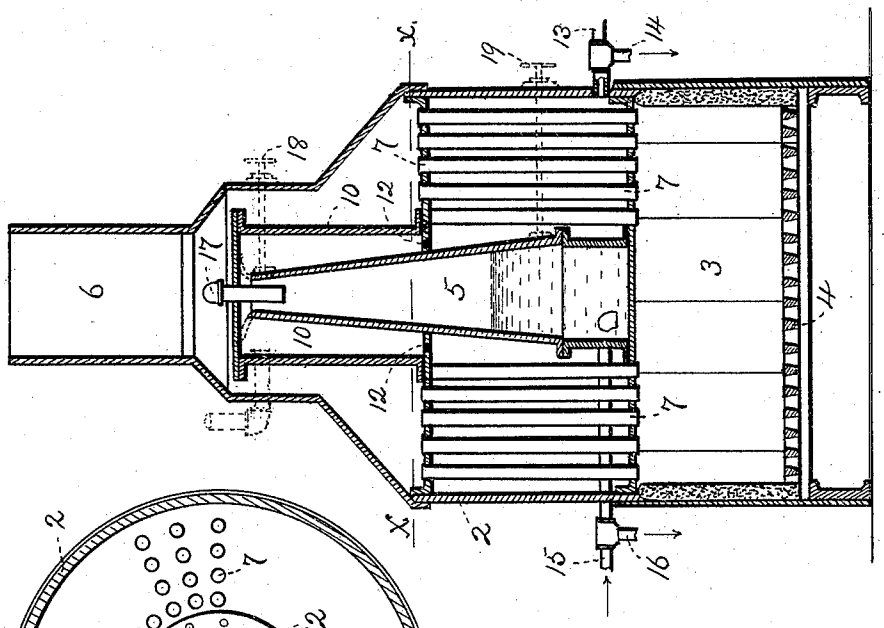


Fig. 3.

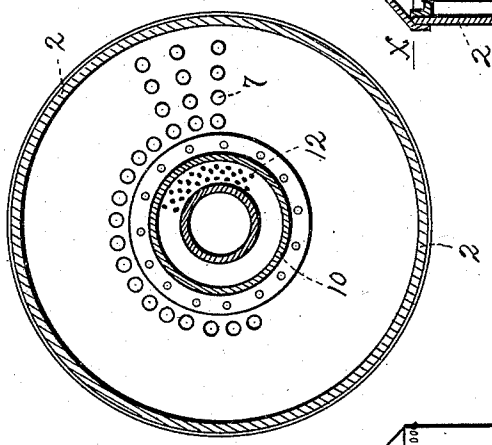
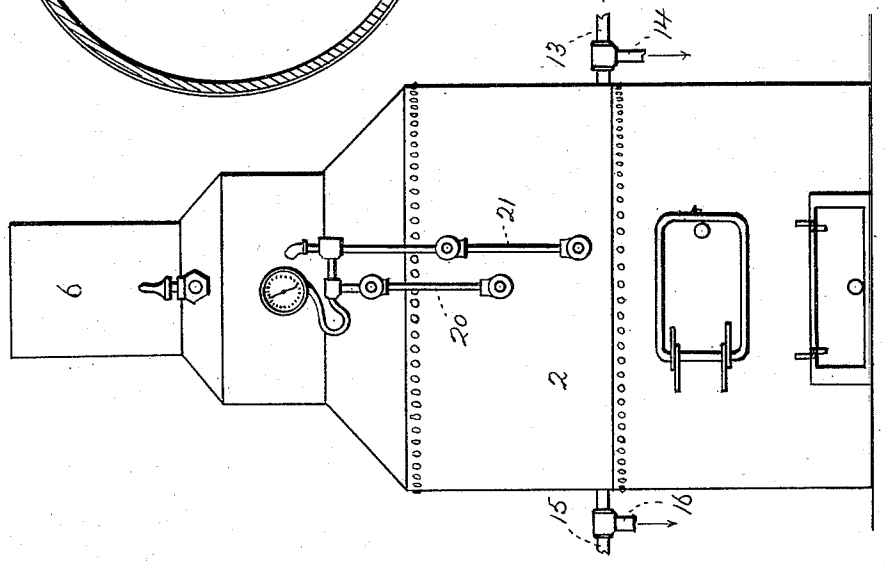


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

THOMAS L. STURTEVANT AND THOMAS J. STURTEVANT, OF FRAMINGHAM, MASSACHUSETTS.

BOILER.

SPECIFICATION forming part of Letters Patent No. 488,229, dated December 20, 1892.

Application filed September 7, 1892. Serial No. 445,290. (No model.)

To all whom it may concern:

Be it known that we, THOMAS L. STURTEVANT and THOMAS J. STURTEVANT, citizens of the United States, residing at Framingham, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Boilers; and we do hereby 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 figures of reference marked thereon, which form a part of this specification.

This invention relates to that class of boilers termed vertical submerged tubular, or such class as have water protected tubes, and it may be considered as pertaining to an improvement upon that shown and described under Serial No. 432,264, filed May 9, 1892, jointly in our names.

The essential characteristics consist in a common steam space together with a central steam dome, independent water levels and a steam discharge in common. In connection therewith we provide an annular tubular portion with an extended steam space formed by a closed drum, also an inner steam generating receptacle, which extends from the crown-plate to or not quite to the top of the drum, when there is an opening to connect the steam spaces, in order to allow the steam therefrom to commingle with that generated in the tubular portion. Other details of construction will be hereinafter described.

The drawings show in Figure 1 a vertical central sectional elevation of a boiler embodying our invention. Fig. 2 is an elevation. Fig. 3 is a horizontal cross-section.

The principal component parts consist of an outer shell 2, a combustion chamber 3, grate-bars 4, a central generating receptacle 5, a stack 6, and flues 7. A crown-plate 8 and a tube-plate 9 together with the said flues form the main steam generating portion, the flues being arranged in an annular group having the central part without them. Attached to the tube plate by a steam joint rises a cylindrical drum 10, which serves as an extended steam space; said drum is above that portion unoccupied by flues, and receives the steam through the openings 12 in the tube-plate 9. Centrally of this boiler is placed the generating receptacle 5 before mentioned, and this is united to the crown-plate by a steam joint being open at the top in order that a common steam space may be provided for. Moreover said receptacle is made tapering in order to afford space in the top plate to allow for passage of steam thereabout into the drum. Independent supply and discharge pipes 13, 14 enter the tubular portion of the boiler, while similar pipes 15, 16 serve to supply water to the central receptacle 5.

In Fig. 1, we have shown the boiler as adapted for separate water-levels with a common steam space, but each may be operated, separately, in which event the tapered inner receptacle 5 may be united at the top to the drum and valves 18, 19 (indicated in broken lines) employed to permit communication or not as may be desired. That is, if the valve 18 is open the water levels are independent with a common steam space; but with the valve 19 open, a common water level, and steam space in common is obtained. In connection with these valves separate water gages 20, 21 are attached when two water-levels are to be carried. In this type of boiler one of the essential points is the arrangement of the parts, whereby separate water-levels are carried with a steam space in common. Hence impure water can be used in the inner receptacle of simple construction, which can be readily cleansed, of impurities, while the tubular and more complicated portion will contain pure water, and the steam made will commingle when wanted.

What we claim is:

1. In a boiler the combination with a steam generator, and a drum for extended steam space of a second steam and water receptacle inclosed by said steam generator and adapted to extend within the drum, a common steam delivery together with separate supply and discharge pipes adapted to maintain independent water levels, substantially as explained.

2. In a compound boiler, the combination with a steam and water receptacle having a series of vertical flues which interconnect the fire-box and stack, of a second receptacle in-

closed by the first, and a steam drum common to both receptacles and which is surmounted on the first-named receptacle and covers the part thereof not furnished with flues, substantially as set forth.

3. In a compound boiler, an exterior steam generating section, having supply and discharge pipes, a series of flues, a stack which co-operates with said flues, and a drum for extended steam, space within said stack, combined with a cylindrical, steam generating section inclosed within the first, independent supply and discharge pipes, therefor, a fire-box in common to both sections, and a common steam delivery, substantially as set forth.

4. A compound boiler, composed of an exterior steam generating section, having a series of flues therethrough, an apertured top portion, and a drum which surmounts said apertured portion, combined with a coniform section secured to the bottom of the exterior section and adapted to extend within the drum, and communicate therewith, a steam delivery common to both sections, and separate supply and discharge pipes, as likewise separate water-gages for independent water levels, substantially as described.

5. In a boiler the combination with an exterior water and steam receptacle, its independent feed and discharge pipes, and drum for extended steam space, of an interior cone-shaped partition attached to the base of said receptacle, and extending into the drum with which it communicates, feed and discharge pipes to maintain a separate water-level within said partition, and a fire-box, and steam delivery pipe in common to both steam-generating portions, substantially as explained.

In testimony whereof we affix our signatures in presence of two witnesses.

THOS. L. STURTEVANT.
THOMAS J. STURTEVANT.

Witnesses:
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