

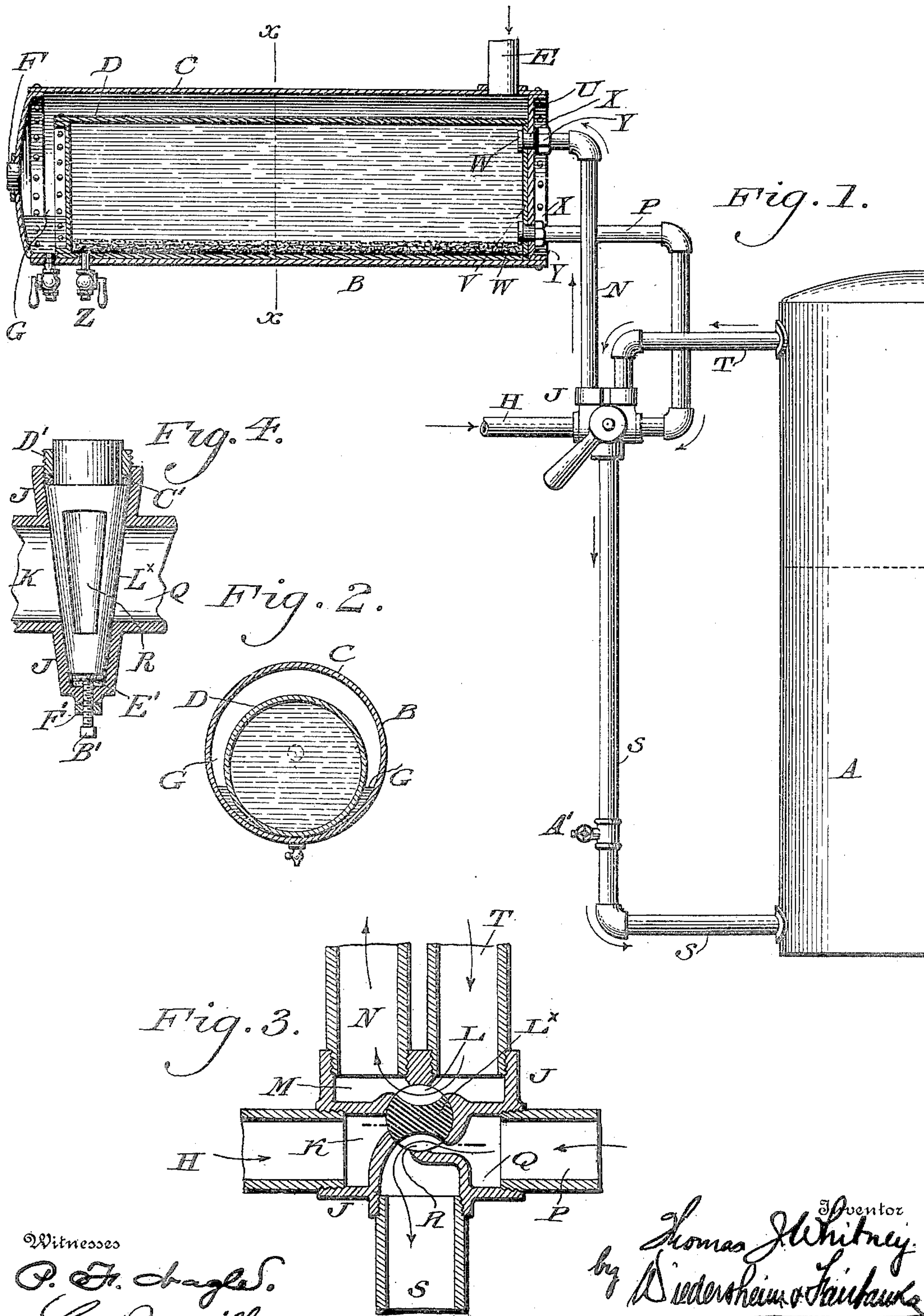
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T. J. WHITNEY.  
STEAM BOILER FEEDER.

(Application filed Feb. 2, 1899.)

(No Model.)



Witnesses

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# UNITED STATES PATENT OFFICE.

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## STEAM-BOILER FEEDER.

SPECIFICATION forming part of Letters Patent No. 640,434, dated January 2, 1900.

Application filed February 2, 1899. Serial No. 704,264. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS J. WHITNEY, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Steam-Boiler Feeders, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to a steam-boiler feeder; and it consists more especially of improvements upon a prior patent granted to me in this same class of invention, wherein I employ a different construction of auxiliary boiler and use an exterior auxiliary or supplemental casing which surrounds the internal boiler or heater and keeps the contents thereof constantly heated to the requisite degree, said internal boiler being heated externally by means of exhaust-steam within said casing and internally by means of live steam which is introduced within said internal boiler when desired, and provision being made by means of pipes and a suitable valve or valves for regulating the circulation between the main and supplemental boiler or heater.

It also consists of an improved construction of supplemental boiler and its adjuncts.

It further consists of novel details of construction, all as will be hereinafter fully set forth, and particularly pointed out in the claims.

Figure 1 represents a side elevation of a steam-boiler feeder embodying my invention, the auxiliary or supplemental boiler being shown in section. Fig. 2 represents a transverse section on line  $x x$ , Fig. 1. Fig. 3 represents, on an enlarged scale, a sectional view of the valve employed and its adjuncts. Fig. 4 represents a sectional view of the valve seen in Figs. 1 and 3.

Similar letters of reference indicate corresponding parts in the figures.

Referring to the drawings, A designates a main boiler, and B the supplemental boiler or feed-water heater, located above said main boiler, said supplemental boiler consisting of an outer shell or casing C, within which is contained the feed-water heater D, it being noticed that the latter is preferably located eccentrically therein, so that the lower portion of the heater D rests upon the adjacent portion of the shell or casing C, whereby a

chamber or receptacle G is formed upon either side for the reception of a body of hot water, as will be hereinafter explained.

E designates a steam-inlet pipe which leads into the upper portion of the space between the heater B and the casing C, whereby steam can be conducted thereinto, said steam leaving the casing C through the pipe F and being conducted to any desired point.

H designates an inlet-pipe for the feed-water, the same entering the valve-casing J through the passage K and passing when the valve is in the proper position through the port L of the valve-plug  $L^x$  into the passage M and pipe N to the upper portion of the heater D. After the heater D is filled to the desired extent the valve-plug  $L^x$  is turned into the position seen in Fig. 3, whereupon it will be seen that the water, which has in the meanwhile been heated to a high degree, flows from the lower portion of the heater, through the pipe P into the chamber Q of the valve, and thence through the port R and the pipe S into the lower portion of the main boiler A. The steam contained in the upper portion of the main boiler A flows therefrom through the pipe T and the passage L into the pipe N, and thence to the heater D, wherefrom it will be seen that the live steam from the main boiler when desired is directed into the feed-water heater or auxiliary boiler D for the desired period, the contents of which in a short time become heated to substantially the temperature of said live steam, which temperature is imparted to the contents of the chamber G, as is evident. By the novel manner of making the connections between the pipes N and P and the heads U and V of the casing C it will be seen that the heater D is held in place without necessitating the employment of other or extraneous fastenings, said pipes being headed internally, as at W, and having packing-washers X adjacent the exterior head U, said washers being held in place by the nuts Y.

It will be apparent from the foregoing that the water in the heater D will always be in a heated condition by reason of its contact with the steam contained in the casing C, and by securing the heater within its casing in the manner specified a body of hot water is retained adjacent the sides and end of the heater D, which also assists in heating the latter.



When the valve is in the position seen in Fig. 3, the water in the lower portion of the heater can readily flow therefrom, since it can flow into the lower portion of the boiler  
 5 A, the circulation being continued from the upper portion of the boiler through the pipe T, passage L, and pipe N to the upper portion of the heater, the effect of which is evident.

It is well known that the deposit or sediment in water if allowed to enter a steam-boiler and come directly in contact with the fire-surfaces is generally converted into scale, this action especially taking place when the water is heated to 275° or 325°; but by my  
 15 present improvement the feed-water is conducted from the heater D about two or three inches from the bottom thereof, and since the steam-pressure in the heater is the same as that in the main boiler the deposits or sediment in the water are precipitated and remain in the heater in a granulated form and are easily blown out by steam-pressure and not allowed to enter the main steam-boiler, the blow-off cock being indicated at Z, and  
 25 the pipe leading to the heater passing through the outer shell C serves to hold the heater D in position, as is evident. By thus keeping the main boiler clean and free from scale and sediment the safety and durability thereof  
 30 are greatly increased. I also provide a blow-off connection A' in the pipe S at a point near where the water enters the main boiler, said pipe being thus freed from any accumulation of cold water and allowing hot water only at  
 35 starting to enter the main boiler.

In Fig. 4 I have shown a longitudinal sectional view of the plug L<sup>x</sup> and its adjuncts, said plug being contained in the casing J and in contact with the set-screw B', whereby  
 40 said plug contacts with the packing C' when the stuffing-box, cap, or gland D' is screwed down. E' designates a washer interposed between the bottom of the plug L<sup>x</sup> and the end of the screw B', the latter being locked in the  
 45 desired position by means of the jam-nut F'.

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

1. In a steam-boiler feeder, a main boiler, a supplemental boiler located above the same and communicating therewith, said supplemental boiler consisting of a shell or casing, an inner heater eccentric thereto, said casing being provided with chambers at its sides and  
 55 upper end, and inlet and outlet pipes communicating with said chambers, in combination with means substantially as described for conducting alternately steam or feed-water into said supplemental boiler.

pipes communicating with the space between said heater and shell or casing.

3. In a steam-boiler feeder, a main boiler, a supplemental boiler located above the same and communicating therewith, said supplemental boiler comprising a heater and a surrounding shell or casing eccentric thereto, the heater resting on the lower side of said shell or casing, and said shell or casing extending  
 75 beyond one end of the heater, and inlet and outlet pipes communicating with said shell or casing.

4. In a steam-boiler feeder, a main boiler, a supplemental boiler located above the same, said supplemental boiler comprising a heater and an outer shell or casing, and pipes communicating with said main and supplemental boilers, said pipes being connected with the walls of said shell or casing and heater for  
 85 holding said parts in assembled position.

5. In a steam-boiler feeder, a main boiler, a supplemental boiler located above the same, said supplemental boiler comprising a heater and an outer shell or casing having heads at  
 90 one end thereof situated adjacent to each other, and pipes communicating with the boiler and supplemental boiler, said pipes passing through and being secured to said adjacent heads to hold said heater and shell  
 95 or casing together.

6. In a steam-boiler feeder, a main boiler, a supplemental boiler located above the same, said supplemental boiler comprising a heater and a surrounding shell or casing with the  
 100 heads at one end thereof situated adjacent to each other, and pipes communicating with said boiler and supplemental boiler, the ends of said pipes communicating with the supplemental boiler passing through the adjacent  
 105 heads and being headed on their inner ends, packing around said pipes exterior to said shell or casing-head, and a gland for compressing said packing and securing said heads together.

7. The combination of a main boiler, a supplemental boiler located above the same, pipes common to said boilers, a valve common to said pipes, said valve consisting of a casing J, a plug L<sup>x</sup>, a stuffing-box, cap or  
 115 gland, D', packing intermediate said plug and stuffing-box, a screw adapted to engage said plug, a washer intermediate said plug and screw, and a jam-nut for locking said screw.

8. In a steam-boiler feeder, a main boiler, a supplemental boiler located above the same, said supplemental boiler comprising a heater and a surrounding shell or casing located eccentrically thereto whereby water-holding  
 125



portion of said main boiler, in combination with a blow-off cock located in said last-mentioned pipe and in the bottom of said heater for withdrawing sediments and precipitates therefrom.

9. In a steam-boiler feeder, the combination of a main boiler, a supplemental boiler located above the same, the latter consisting of a heater and a surrounding shell or casing located eccentrically with respect thereto, means for introducing and withdrawing steam from said casing, an inlet-pipe leading to the upper portion of said heater, a discharge-pipe leading from the lower portion thereof, a short distance above the base of said heater, a valve common to said pipes, a main boiler having a pipe leading from the upper portion thereof to said valve, a pipe leading from the lower portion of the latter to said main boiler, an inlet-pipe leading to said valve for the introduction of feed-water, the pipe leading from said valve to the upper portion of said heater serving both to conduct feed-water to said heater and also as a conduit for steam from the main boiler to said heater, and blow-offs for the inlet-pipe to said main boiler and for said heater.

10. The combination with a main boiler and a supplemental boiler located above the latter of pipes common thereto and a valve controlling the passage of water through said pipes, said valve comprising a casing, a recessed plug located therein, said plug having a shoulder, a gland engaging the casing, packing intermediates said gland and plug, a washer located adjacent the opposite end of said plug and a set-screw engaging said washer, said set-screw being provided with a jam-nut for locking the same.

11. In a steam-boiler feeder, a main boiler, a supplemental boiler located above the same, said supplemental boiler consisting of a casing having chambers at its sides and upper end and an inner heater located eccentrically in said casing, and inlet and outlet pipes communicating with said chambers, in combination with means for conducting live steam from said main boiler to the interior of said supplemental boiler and means for conducting feed-water also to said supplemental boiler.

12. In a boiler-feeder, a main boiler, a supplemental boiler located above the same, said supplemental boiler comprising an inner heater and a surrounding shell or casing eccentric thereto, inlet and outlet pipes in communication with the space between said heater and shell or casing and pipes N and P and T and S communicating with the upper and lower portion of said supplemental boiler and main boiler respectively, in combination with a controlling device for controlling the flow of steam from said main boiler to the supplemental boiler and the flow of water from said supplemental boiler to said main boiler respectively.

13. In a steam-boiler feeder, a main boiler, a supplemental boiler located above the same and communicating therewith, said supplemental boiler consisting of a shell or casing, an inner heater eccentric thereto, said casing being provided with chambers at its sides and upper end and inlet and outlet pipes communicating with said chambers.

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