(No Model.)

G. H. CONKLIN.

FEED WATER HEATER.

No. 493,981. Patented Mar. 21, 1893.

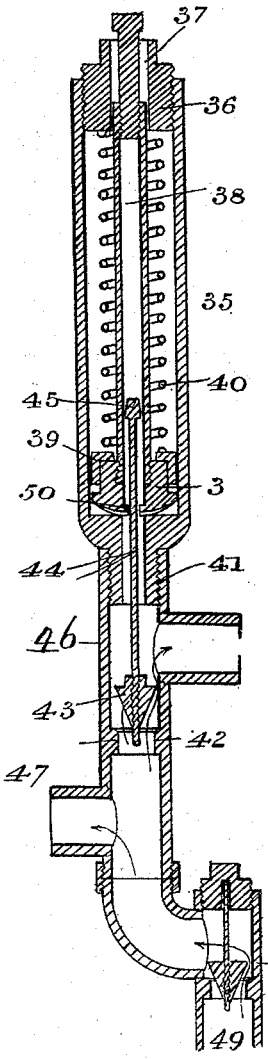

Fig. 5.

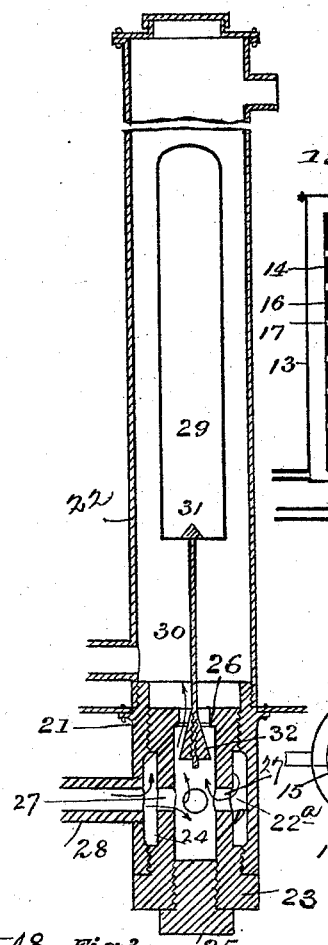

Fig. 3

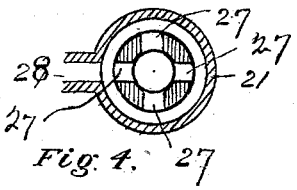

Fig. 4.

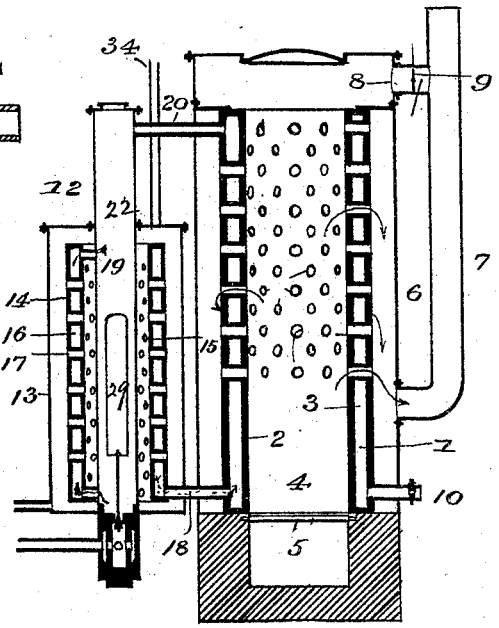

Fig. 1.

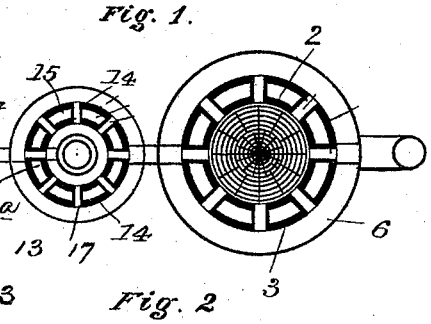

Fig. 2

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FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 493,981, dated March 21, 1893.

Application filed December 5, 1892. Serial No. 454,198. (No model.)

To all whom it may concern:

Be it known that I, GILBERT H. CONKLIN, a citizen of the United States, and a resident of Riverhead, in the county of Suffolk and State of New York, have invented certain new and useful Improvements in Feed-Water Heaters; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in feed-water heaters for steam boilers, the object being to provide an improved construction of the same whereby I secure superior results with respect to simplicity economy, and efficiency in operation.

The invention consists in the novel construction and combination of parts hereinafter fully described and claimed.

In the accompanying drawings: Figure 1 is a sectional elevation of a steam boiler and a feed-water heater constructed in accordance with my invention. Fig. 2 is a cross section of the same. Fig. 3 is a sectional elevation on an enlarged scale of the feed-water heater. Fig. 4 is a cross section of the same. Fig. 5 is a sectional elevation of a safety-valve used in connection with the force pump by which the feed water is supplied to the heater.

In the said drawings the reference numeral 1 designates a steam boiler of any suitable construction, being shown in the present instance as an upright consisting of two concentric cylinders 2 and 3 connected together at their top and bottom, forming a fire chamber 4, provided with a grate 5. These cylinders are surrounded by a cylindrical casing or jacket 6, with which and the fire chamber, communication is established by means of a number of radial tubes passing through the cylinders 2 and 3.

The casing or shell is provided with a smoke-stack 7, and a short pipe 8, near the upper end provided with a damper 9. At its lower end the boiler is provided with a blow-off pipe 10.

The numeral 12 denotes the feed-water heater, consisting of a casing 13, two concentric cylinders 14 and 15 connected together at top and bottom forming a water space 16. Passing radially through the cylinders are a number of radial tubes or flues 17. At its lower end the water receptacle is provided with a pipe 18, leading to the boiler.

Located within the inner cylinder 14 is a vertical water tube 22 connected with the water receptacle by means of a pipe 19, and at its upper end is connected with the boiler by means of a pipe 20.

To the lower end of the casing 13 is secured an extension 21, formed with an intermediate annular recess 22^a. In this extension is located a plug 23, provided with a peripheral recess 24, coinciding with recess 22^a. This plug is hollow, being closed at its lower end by a screw plug 25, and at its upper end provided with a valve-seat 26, and intermediate its end is formed with a number of holes or passages 27, for the passage of water from supply pipe 28.

In the water tube 22 is located a bob-float 29 secured to a valve-stem 30, provided with a conical head 31. The lower end of this valve stem is provided with a conical valve 32.

The numeral 34, denotes a pipe by which the exhaust steam from the cylinder is carried to the water-heater.

The operation is as follows: The water is fed to the heater and boiler by means of a force-pump or other suitable device, raising the bob-float and the valve-stem and its valve and cutting off the supply of water. The exhaust steam from the engine will be carried to the shell or casing 13 by pipe 34 and passing through the pipes or flues 17, will heat the water in the water receptacle. As the water level in the boiler and heater lowers, the bob-float will be correspondingly lowered opening the valve and allowing the water to again be fed until the proper level is reached.

In Fig. 5 I have shown an improved safety-valve to be used in connection with my invention. In said figure the numeral 35 designates a cylindrical casing or tube having a screw-plug 36, at its upper end, provided with a central bore or aperture 37 in which works a hollow piston-rod 38, provided at its lower end with a piston 39. Surrounding the piston rod is a coiled spring 40, which presses the piston or valve 39 down upon its seat. Connected with the lower end of the cylinder 35,

is a valve casing 41, having a valve seat 42, and a valve 43, secured to a valve-rod 44, passing up through the bottom of casing 35, into the hollow piston-rod 38, and provided with a head 45. Intermediate of the valve 43 and the bottom of casing 35 is the pipe 46 connected with the supply pipe 28.

The numeral 47 designates a portion of the force pump, and 48 the pipe leading to the source of water supply provided with a valve 49.

The operation is as follows: When the boiler is to be supplied with water the pump is operated in any suitable manner, the valves 49 and 43 alternately opening and closing as usual. When the boiler has received the proper amount, the bob-float will close valve 32, causing the water from the source of supply to be forced up piston 39 until the shoulder 50 thereon strikes the head 45, raising valve 43 from its seat and retaining it in such position, and causing valve 49 to close, so that no water will be supplied to the pump. When the bob-float lowers, however, and opens valve 32, the piston will descend and valves 49 and and 43 again alternately open and close to supply the feed water heater and boiler.

Having thus described my invention, what I claim is—

1. In a feed-water attachment the combination with a steam boiler of an inner and an outer concentric cylinder forming a water receptacle connected with said boiler, a water tube located in said inner cylinder and connected with the water receptacle and with the boiler, the extension to said tube having an annular recess, the hollow plug located in said extension and provided with a corresponding recess and with water passages, the supply pipe, the bob-float, and the valve-stem secured thereto provided with a conical valve, substantially as described.

2. The combination with a steam boiler, of the feed water attachment comprising an inner and outer concentric cylinder forming a water receptacle connected with said boiler, a water tube located within the inner cylinder and connected with the water receptacle and boiler, the bob-float located in the water tube provided with the valve stem and valve, the hollow plug having a valve seat in its upper end and connected with a supply pipe, the safety valve comprising a casing a hollow piston rod, a coiled spring, a piston, having a central bore and a shoulder, the valve rod provided with a head, and a valve the valve casing connecting with the supply pipe leading to the water tube, and the pipe and valve communicating therewith and with the source of water supply, substantially as described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

GILBERT H. CONKLIN.

Witnesses:
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