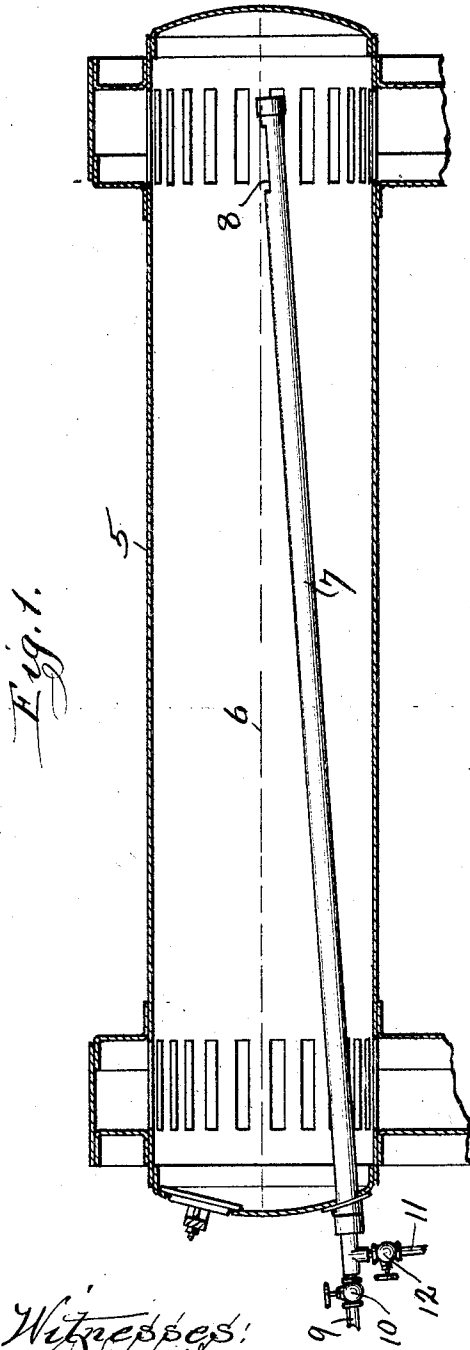


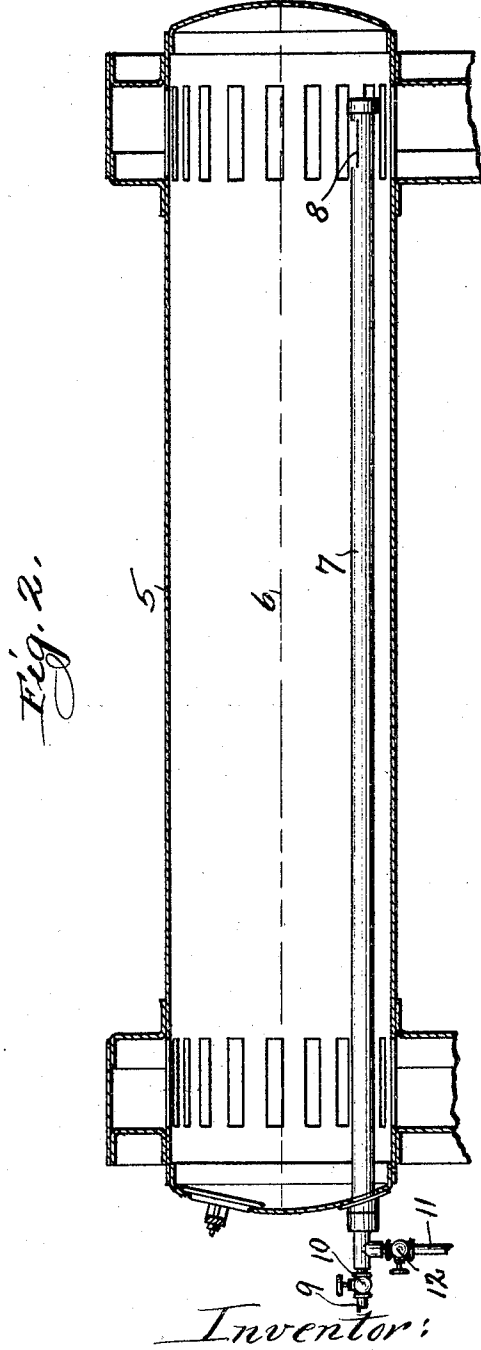
No. 790,816.

PATENTED MAY 23, 1905.

G. Y. BONUS.  
HOT WATER PURIFIER FOR BOILERS.  
APPLICATION FILED MAY 12, 1904.



*Witnesses:*  
*M. J. Griffin*  
*Raymond*



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*By R. J. Jacobs*  
*Att'y.*

# UNITED STATES PATENT OFFICE.

GEORGE Y. BONUS, OF CHICAGO, ILLINOIS.

## HOT-WATER PURIFIER FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 790,816, dated May 23, 1905.

Application filed May 12, 1904. Serial No. 207,676.

*To all whom it may concern:*

Be it known that I, GEORGE Y. BONUS, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a new and useful Combined Feed-Pipe, Water-Heater, Settling-Chamber, and Hot-Water Purifier for Boilers, of which the following is a specification.

My invention relates to a combination of several separate and distinct devices used in connection with steam-boilers. It serves as a feed-pipe and blow-off through which water is supplied to the boiler. It serves as a water-heater to heat the water previous to allowing it to mix with the water in the boiler. It serves as a settling-chamber in which the heavier impurities in the heated water precipitate, and it serves as a hot-water purifier or skimmer to remove the lighter impurities and scum from the surface of the hot water within the boiler; and the objects of my improvement are, first, to provide a single device which will replace or accomplish the results of several devices; second, to produce a cheap, durable, and effective device, and other objects which will become apparent from the description to follow. I attain these objects by the construction shown in the accompanying sheet of drawings, forming a part of this specification, in which—

Figure 1 is a fragmental longitudinal vertical section of a boiler having my invention applied thereto, and Fig. 2 is a similar view showing a modified form of my invention.

Heretofore an ordinary feed-pipe was used to feed the fresh supply of water into the boiler, a special heater was located near the boiler to heat the water to a certain temperature before admitting it through the feed-pipe into the boiler, a specially-designed settling-chamber was provided, usually in connection with the heater, into which the heavier impurities of the heated water precipitated, and a special skimmer or purifier was provided on the surface of the water within the boiler to remove the lighter impurities and scum from the water; but with my invention applied to a boiler all these results are attained in a simpler and cheaper manner.

My invention consists, substantially, of

making the feed-pipe of a large size and extending it a considerable distance inside of the boiler, having its end terminate on or below the water-line and provided with a large opening.

Referring to the drawings, similar reference characters refer to similar parts throughout both views.

In Fig. 1, 5 is the drum connecting the headers of a water-tube boiler, the water-line being represented by the dotted line 6.

While I have shown and will describe my invention in connection with a water-tube boiler, it will be understood that it can be used with any kind of a boiler.

A large pipe 7 is provided within the drum 5 and has one end extending to the exterior, preferably through the front head of the drum 5. The remaining end of the pipe 7 is provided with a large opening 8 at or near the water-line. A sufficient length of the pipe 7 is located within the boiler or drum 5 to thoroughly heat the water which is being fed in through the pipe 7. On the exterior of the boiler the end of the pipe 7 is provided with a connection to the ordinary feed-pipe 9, which is provided with a valve 10. It is also connected to a blow-off pipe 11, which is provided with a valve 12.

I prefer to have the pipe 7 on an incline, the inner end having the hole 8 being the highest—i. e., on the water-line.

If the entire length of the pipe 7 were to extend in a horizontal plane instead of being on an incline, it would still serve the purposes enumerated above and be within the scope of the invention embodied in the appended claims.

Fig. 2 shows a modification where the inner end of the pipe 7, having the opening 8, is below the water-line. This construction is to be used when the device is not intended to serve as a skimmer.

In operation the valve 12 is normally closed. The valve 10 is open to allow the water to be fed into the boiler at such a rate of speed which will compensate for the amount of steam escaping from the boiler to always keep the water at the predetermined water-line. The pipe 9 being considerably smaller

than the pipe 7, the water will travel slowly through the pipe 7, and thus become thoroughly heated before it escapes out through the opening 8 and mixes with the boiling water within the boiler and which surrounds the pipe 7. The heating of the water within the pipe 7 causes the heavier impurities in the water to precipitate in the pipe 7 and remain in said pipe. The lighter impurities rise in the pipe and finally pass out of the opening 8 and form a scum on the surface of the water within the boiler.

To remove the sediment within the pipe 7 and the scum on the surface of the water  $\alpha$ , the valve 10 is closed and the valve 12 is opened. The pressure within the boiler will force the scum into the opening 8 through the pipe 7, carrying all the sediment in said pipe with it, and out through the blow-off pipe 11, which is open to the atmosphere.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a device of the class described, a boiler, a large pipe passing through and secured to

one end of said boiler, said pipe terminating near the other end of said boiler, a large opening in said pipe near the terminal end, and means on the exterior of said boiler connected to said pipe whereby the water is fed through said pipe into the boiler and the sediment is forced through said pipe out of the boiler.

2. In a device of the class described, a boiler, a large pipe passing through and secured to one end of said boiler, said pipe being on an incline on the interior of said boiler, a water-feed pipe and a blow-off pipe connected to the exterior end of said large pipe whereby water is fed to the boiler and sediment is blown out from the boiler through the said large pipe.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 30th day of April, 1904, at Chicago, Illinois.

GEORGE Y. BONUS.

Witnesses:

JOHN J. ROONEY,  
R. J. JACKER.