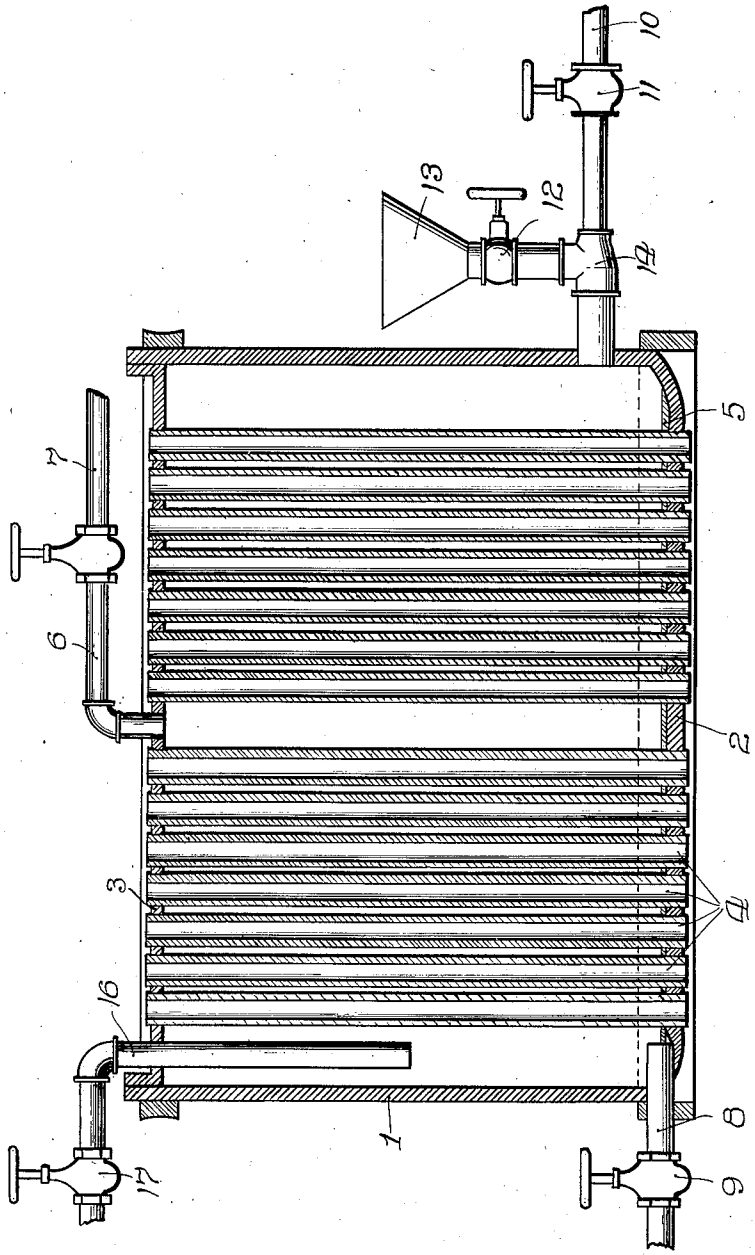
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METHOD OF STOPPING LEAKS IN BOILERS AND THE LIKE.

APPLICATION FILED JULY 9, 1917.

1,317,658. Patented Sept. 30, 1919.



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METHOD OF STOPPING LEAKS IN BOILERS AND THE LIKE.

1,317,658. Specification of Letters Patent. Patented Sept. 30, 1919.

Application filed July 9, 1917. Serial No. 179,584.

To all whom it may concern:

Be it known that I, PHILIP D. JOHNSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Methods of Stopping Leaks in Boilers and the like, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to a method of stopping leaks in boilers and the like.

It has been found in operating steam boilers of various types heretofore known that oil in the feed water of the boiler is likely to cause a leakage of the boiler. This has been ascribed to the fact that the oil when highly heated is more fluid and apparently has less cohesion and less adhesion than the water in the boiler. Whatever the explanation may be it is a fact that oil finds its way through minute cracks and crevices in the boiler quickly and apparently with great ease. In a well known make of steam automobile the practice of introducing oil with the feed water has been adopted and although the tubes are joined to the heads by brazing it has been found that the brazed joints do not remain tight. It seems that the contraction and expansion of the parts of the boiler cracks the brazed joints to a greater or less extent. As a consequence the oil in the feed water finds its way through these minute openings and as soon as the oil has gone through the openings it has been found that the water follows and leaks develop.

My invention teaches a method of treating the boiler so as to stop up these minute leaks after they are formed.

I shall now set out my invention in detail in connection with the accompanying drawings which form a part of the present specification in order that those skilled in the art may be apprised of the manner of practising my invention.

The single figure of the drawings is a vertical sectional view of a boiler of the type employed in a well known make of steam automobile. The boiler comprises an outer shell 1 which is cylindrical in shape. The lower head 2 which is next to the fire is formed integral with the side walls and the upper head 3 is secured by a flange to the rim of the shell 1. A plurality of fire tubes 4 are connected to the head of the boiler. The fire tubes 4 are secured as by means of brazing, as indicated at 5, to the head 2. The boiler is provided with a steam connection 6 which leads by way of a pipe 7 to the engine of the automobile. The lower part of the boiler is provided with a blow-off connection 8 which is controlled by a blow-off cock or valve 9, as is well understood in the art. A feed water connection 10 which may be controlled by means of a valve 11 is connected to the boiler and I have provided a feed connection 14 and a valve 12 for the purpose of introducing the caustic into the boiler as will be described later. For this purpose I employ a funnel 13 which is connected through the valve 12 and the T 14 to the boiler. The feed water connection 10 is connected to a feed pump which in turn is driven by the engine of the automobile.

I provide also a blow off pipe 16 having a valve 17 which pipe terminates at or below the normal water level, for drawing off the scum, oil and suds from the water.

It is to be understood that my invention is to be applicable to any type of boiler which employs joints or connections which are likely to leak, the particular boiler which I have illustrated being a particular boiler in connection with which I have found my invention to be highly useful.

As previously explained it has been found that leaks should develop particularly around the joints between the tubes 4 and the lower head or sheet 2. The leaks develop in spite of the spelter 5 by which the tubes are joined to the lower sheet.

I introduce feed water through the connection 10 to cover the tube sheet 2 and then introduce a strong caustic through the funnel 13 and the valve 12. The proportion of caustic to water is not of the greatest importance.

The caustic which I have employed is commercial concentrated lye, such as may be purchased at drug shops. It consists of a dense liquid solution of sodium hydroxid. I employ from one to two pints of this concentrated lye to seven gallons of water to make a strong alkaline solution capable of rapidly combining with the grease and oil which adhere to the tubes 4, the drum 1 and the heads 2 and 3. The exact proportions of water and caustic solution are not im-

portant as a weaker solution requires a longer time and a stronger solution acts in less time to unite with the grease and oil in the boiler.

The caustic solution in the boiler is then boiled and a pressure of upward of 100 pounds is usually generated in the boiler to expedite the operation.

As soon as the contents have boiled preferably under pressure the valve 17 in the pipe 16 is opened and the froth and suds which accumulate at the surface of the water are drawn off through the pipe 16 and blown off. It will be noticed that the pipe 16 projects down a short distance below the normal level of the water in the boiler so as to draw off the scum and suds as above described. The matter blown off through the pipe 16 at this time appears to be a low grade of soap. Considerable oil and uncombined alkali may be present in the soap and other materials may be present. I have not made an exact analysis to determine their composition.

I continue boiling and introducing more water and blowing off the scum until the blow-off is relatively free of soap and oil. It will be found at this time that the small leaks through which the water had been issuing are closed up and the boiler may then be emptied by means of the blow-off connection 8 and filled with clear water or the boiler may be gradually washed out by introducing water at the feed connection 10 and blowing off at the blow-off connection 8. The steam generated during this process is employed to run the pump for introducing feedwater.

It appears that the boiling of the lye and grease together under pressure forms a soap which is readily soluble and is carried out by blowing off and washing out. The formation of the soap removes the grease and oil particularly from the small cracks which have previously leaked. I am not certain of the exact action involved. Suffice it to state that the small leaks which existed before the above treatment are effectually stopped after this treatment.

I do not intend to be limited to the exact procedure described except as the same is set forth in the appended claims. I consider this method of stopping leaks in a boiler to be broadly new and intend that the claims be construed in the light of that fact.

I claim:

1. The process of closing leaks in a boiler which consists in partially filling the boiler with water, then adding lye to the water to form a strong caustic solution, then heating the solution in the boiler to the boiling point, and then blowing off the contents.

2. A process of closing leaks in a boiler which are caused by the presence of oil in the boiler, which consists in partially filling the boiler with a strong caustic solution, then boiling the caustic solution and then blowing off the contents.

3. A process of closing leaks in a boiler which are caused by the presence of oil in the boiler, which consists in partially filling the boiler with a strong caustic solution, then boiling the caustic solution, under pressure, then blowing off the scum and other foreign matter.

In witness whereof I hereunto subscribe my name this 7th day of July A. D. 1917.

PHILIP D. JOHNSON.