J. CHANDLER.

Improvement in Compound and Apparatus for the Removal of Incrustations in Steam-Boilers.

No. 132,439. Patented Oct. 22, 1872.

Fig. 1.

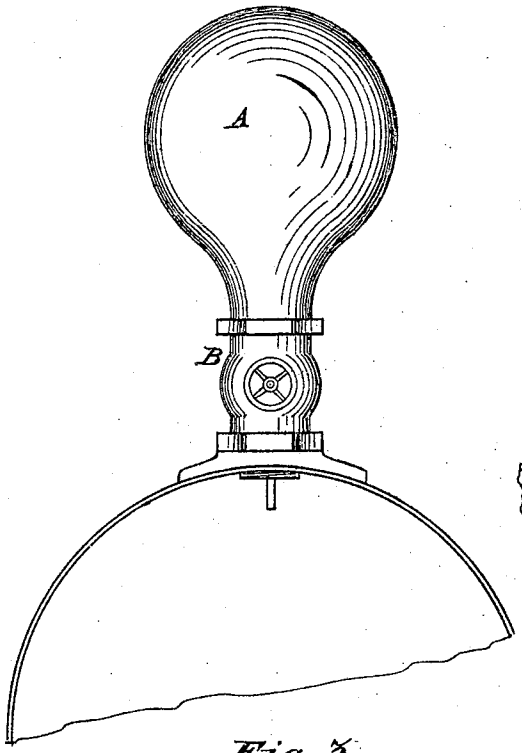


Fig. 2.

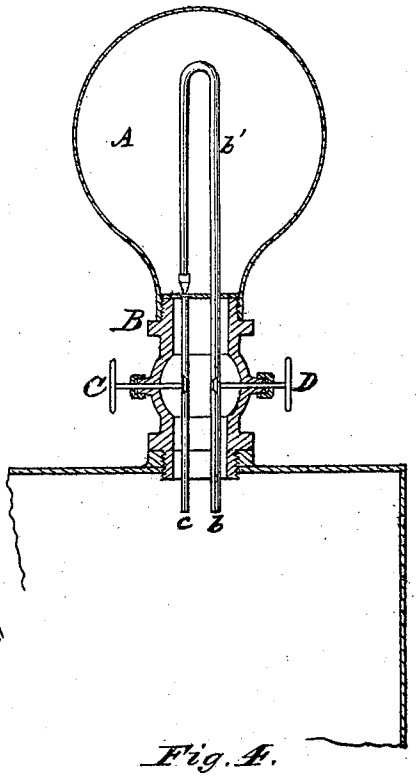


Fig. 3.

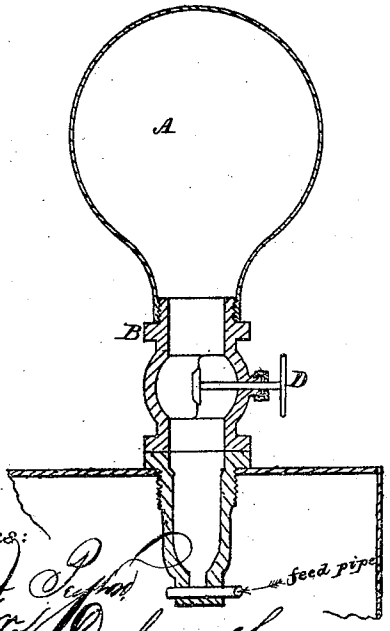
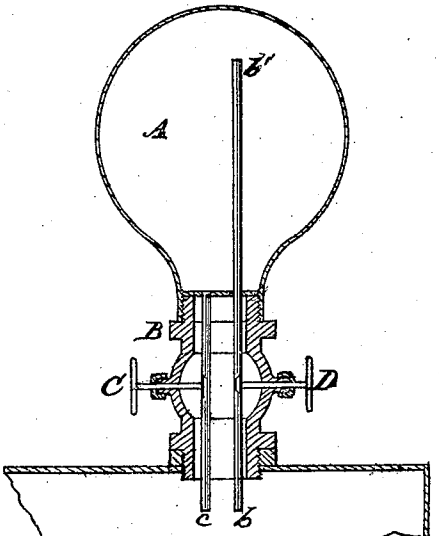


Fig. 4.



Witnesses:

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Wm. R. Dunham

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UNITED STATES PATENT OFFICE.

JOSEPHUS CHANDLER, OF PIONEER, PENNSYLVANIA.

IMPROVEMENT IN COMPOUNDS AND APPARATUS FOR THE REMOVAL OF INCRUSTATIONS IN STEAM-BOILERS.

Specification forming part of Letters Patent No. **132,439**, dated October 22, 1872.

To all whom it may concern:

Be it known that I, JOSEPHUS CHANDLER, of Pioneer, in the county of Venango, State of Pennsylvania, have invented certain Improvements in a Compound and Apparatus for the Prevention of Scale in Steam-Boilers, of which the following is a specification:

This invention relates to the means employed for the prevention of scale in steam-boilers and for the removal of such scale or incrustation when already formed; and it consists, first, in an apparatus for containing and feeding the chemicals to the water in the boilers, which apparatus can likewise be used with good effect as a cylinder-cup; and second, in the employment of petroleum-tar, or its equivalent petrolerine, commonly called "B S" oil, to prevent the formation of scale and to disintegrate and decompose that already formed.

It is a well-known fact that almost all waters contain lime and other salts in solution, and that these are deposited in the form of incrustation or scale upon the inner surfaces of steam-boilers, seriously interfering with the transmission of heat and impairing the durability and safety of the boiler. This mineral matter may be carbonates or sulphates of lime, iron, magnesia, &c., which the heat and evaporation causes to be deposited in the form of scale. The deposit to be dreaded more especially is the sulphate of lime, and this is a salt that will form deposits at all temperatures and all densities. To prevent the formation of these incrustations I employ petroleum-tar or "petrolerine," which may be introduced into the boiler previous to heating, but is preferably introduced at a later stage, and by means of an apparatus to be hereinafter described.

Petrolerine is a material which separates from crude petroleum by standing in contact with water, and is also an ingredient of petroleum-tar. The addition of these ingredients to the water in the boiler is at once followed by the precipitation of the mineral matter contained in the form of a light dirty scum, in which condition it settles in the "mud-drum" and is readily blown off.

I will now proceed to describe the apparatus I employ for introducing the petrolerine into the boiler, and will simply premise that it is equally useful for the introduction of other chemicals, and needs no modification to render it efficient as a cylinder-cup.

In the drawing, Figure 1 is a side view of my improved apparatus; Fig. 2 is a vertical section of the same; Fig. 3 is a vertical section of a modified form, in which a jet of feed-water is employed to carry in the tar; Fig. 4 is a modification, in which steam is admitted to the tar-chamber and acts by equalizing pressure instead of as an injector.

A is the chamber for the reception of the petrolerine or other chemical. B is the solid portion or base, which is perforated by two tubes or channels, *b* and *c*. The channels *b* and *c* are provided with stop-cocks C and D. From the tube *b* a pipe, *b'*, projects into the chamber A, and, after rising to near the top thereof, is bent down so as to bring the nozzle within the slightly-cupped entrance of channel *c*. In Fig. 4 the pipe *b'* is shown as terminating in the upper part of chamber A.

The chamber A being filled with the chemical, and the stop-cocks C and D opened, steam from the boiler will enter the pipe *b* and (in Fig. 2) pass through the pipe *b'*, and from the nozzle thereof into the channel *c*, carrying the chemical with it, into the boiler, on the injector principle; or (in Fig. 4) it will escape into the upper part of chamber A, equalizing the pressure and permitting a flow of petrolerine into the boiler.

In Fig. 3 is shown a modified form of the apparatus, in which there is but one channel or outlet from chamber A, and this outlet is into the feed-water pipe, and it is so arranged that a jet of feed-water impinges on the tar in the jet-tube leading from chamber A and carries a portion of the petrolerine along with it into the boiler.

I do not claim the employment of petroleum for preventing incrustation in steam-boilers, for such is not new, it being set forth in the Letters Patent granted to Josiah Allen, dated April 2, 1867.

Claims.

1. The process herein described for the prevention of incrustation in steam-boilers by the

use of petroleum-tar or petrolerine, substantially as set forth.

2. The combination of chamber A and base B, provided with channels *b* and *c*, as specified.

3. The chamber A provided with the outlet *b'*, in combination with the feed-pipe of a boiler, as specified.

4. The chemical-chamber provided with an inlet and outlet tube and suitable stop-cocks, as and for the purpose set forth.

To the above specification I have signed my name this 20th day of March, 1872, before two subscribing witnesses.

JOSEPHUS CHANDLER.

Witnesses:
FRANK M. CHANDLER,
H. S. PERRY.