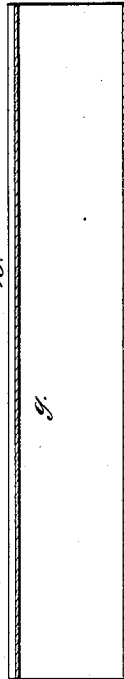
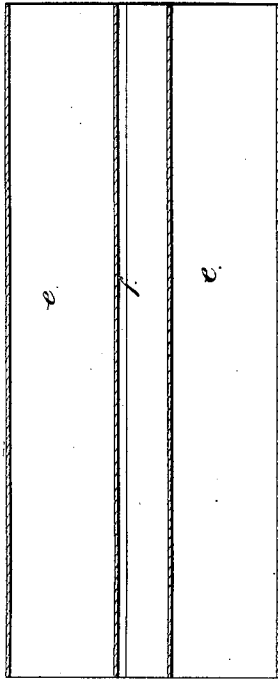
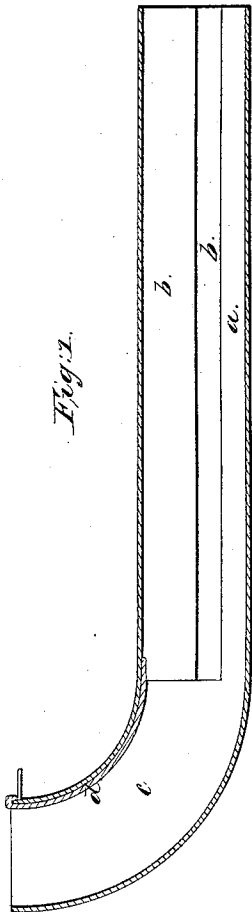
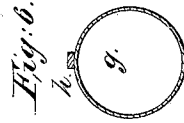
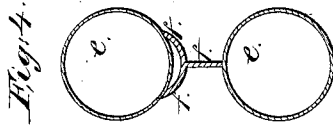
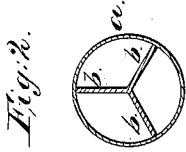


F. P. Dimmyfel,

Removing Incrustation from Steam Boilers.

No 13,488.

Patented Aug. 28, 1855.



Witnesses:
Wm. S. Bishop
Andrew Deacy

Inventor:
F. P. Dimmyfel

UNITED STATES PATENT OFFICE.

FREDERICK P. DIMPFL, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVED METHOD OF FACILITATING THE REMOVAL OF INCRUSTATION FROM STEAM-BOILERS.

Specification forming part of Letters Patent No. 13,488, dated August 28, 1855.

To all whom it may concern:

Be it known that I, FREDERICK P. DIMPFL, of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in the Method of Facilitating the Removal of Incrustation from the Tubes of Steam-Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a longitudinal section of a tube; Fig. 2, a cross-section thereof. Figs. 3 and 4 are like sections of a modification of my invention, and Figs. 5 and 6 like sections of another modification.

It is well known that the principal difficulty in removing the incrustation formed on the cylindrical surface of the tubes of steam-boilers, particularly on the inside, arises from the fact that the incrustation formed presents a complete circle which cannot be removed until it is broken. The adherence of the incrustation to the surface of some metals is very slight and to others greater, but will be overcome by expansion and contraction, and, if the incrustation can be prevented from forming on the entire circle of the tube, it can be readily removed.

In view of these well-known facts my invention consists in preventing the incrustation from forming on the entire circle of the internal or external surface of tubes or flues by placing strips of metal in contact with the metal surface to prevent the union of the incrustation along such line of contact, so that the scale formed may be readily removed.

In Figs. 1 and 2 of the accompanying drawings, *a* represents a water-tube, inside of which is placed a strip of metal forming three radial wings or feathers, *b b b*, extending the whole length of the tube, with the edges of the feathers in contact with the inner surface of the tube. Along the lines of contact of the feathers the incrustation will not be formed, so that by drawing out the wings the incrustation will present three segments of the circle, which in brass or smooth copper tubes will drop off and be washed out and in iron tubes will be readily scaled off and removed. When the tube is curved at one end, as at *c*, the wings only extend along the straight part, and to the end is attached a wire or other flexible substance, *d*, which extends up through the curved part and is secured at the upper end. In this way the

wings can be drawn out and inserted, and the wire *d* will be in contact with the bent surface and there make a break in the incrustation to admit of removing it.

The number of wings or feathers may be increased at pleasure, and, instead of being straight, they may be twisted, so that in the act of drawing out the wings the scale will be drawn out with them. The drawing out of the wings or feathers can be readily done, particularly when the tubes are slightly conical. When conical tubes are placed in a vertical or nearly vertical position, and with the larger end up, the edge of the wings may be made tapering—that is, so much thicker at the upper than the lower end that the segments of incrustation formed between the wings will drop freely out of the lower end of the tubes.

In the case of cylindrical or nearly cylindrical flues the wings or feathers should be applied to their outer surfaces, as represented in Figs. 3 and 4 of the accompanying drawings, where *e e* represent two tubular flues with three wings or feathers, *f f f*, one resting on the top of the lower flue and the other two bearing against the under surface of the upper flue. It will be obvious that the wings applied in this or any analogous way will leave breaks in the circle of the incrustation, which will facilitate its removal.

I contemplate also applying the principle of my invention as represented in Figs. 5 and 6, where *g* represents a water-tube with a strip of metal, *h*, in contact or nearly in contact with the external surface and along the entire length. This will prevent the forming of an incrustation along that part of the inner surface of the tube that is along that part of the surface which is immediately opposite the strip of metal.

I have thus described my invention and pointed out the various modes in which I have contemplated its application that the modes of operation may be distinguished from the mere modes of application.

What I claim as my invention, and desire to secure by Letters Patent, is—

The method, substantially as herein described, of facilitating the removal of incrustation in steam-boilers by inducing breaks in the circle of the incrustation, in the manner substantially as described.

Witnesses: F. P. DIMPFL.

JOHN THOMPSON,
WM. H. KISTERBOCK.