C. STEWART.

Steam Boilers.

No. 142,180. Patented August 26, 1873.

Fig. 2.

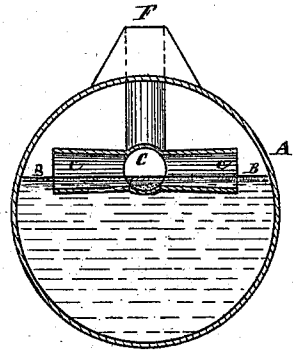


Fig. 1.

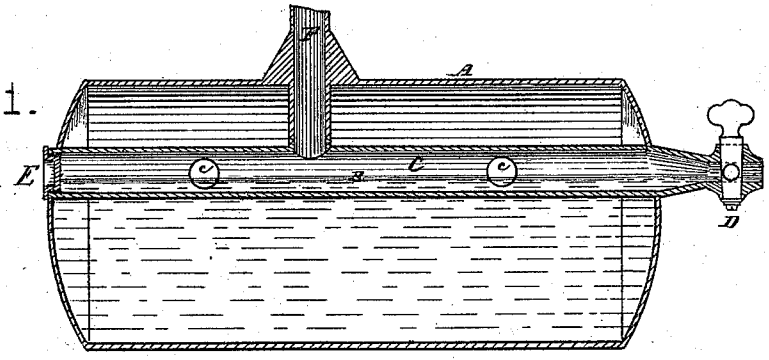
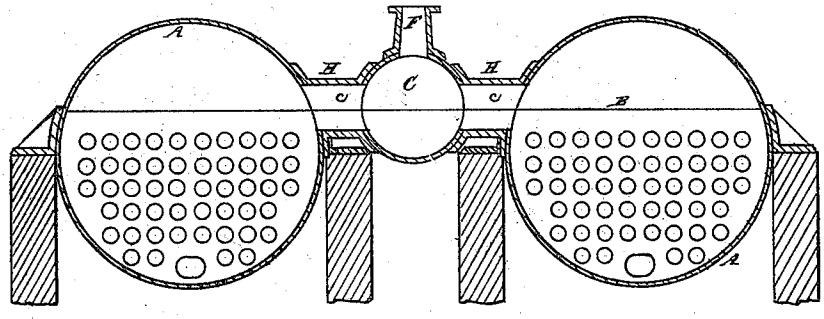


Fig. 3.



Witnesses.

Chas. F. Burleigh
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Inventor.

Charles Stewart

UNITED STATES PATENT OFFICE.

CHARLES STEWART, OF WORCESTER, MASSACHUSETTS, ASSIGNOR OF ONE-HALF HIS RIGHT TO WILLIAM ALLEN, OF SAME PLACE.

IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. **142,180**, dated August 26, 1873; application filed July 1, 1873.

To all whom it may concern:

Be it known that I, CHARLES STEWART, of the city and county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 represents a longitudinal section of a steam-boiler embracing my invention. Fig. 2 represents a transverse section of the same, and Fig. 3 illustrates my invention as applied to a pair of boilers.

The object of my invention is to provide a device for the prevention of the deposit of earthy matter and the formation of scale or incrustation upon the interior of the boiler-shell, and also to facilitate the removal of mud and scum from the water within the boiler. My invention consists in the combination, with the boiler and steam-pipe, of a peculiarly-arranged scum-collecting chamber and blow-off, substantially as hereinafter described.

In the drawings, A denotes the boiler-shell, and B indicates the line of water-level within the boiler. C indicates the scum-collecting chamber, which, in the present instance, consists of a hollow cylinder arranged longitudinally throughout the length of the boiler coincident with the water-level B, and with its ends extending through the heads of the boiler. At the rear end a blow-off cock, D, is provided, and at its front end a hand-hole having a cap, E, secured by screwing it into the end of the chamber or otherwise in such a manner that it can readily be removed when desired. The chamber C is provided with lateral openings *c* at the water-line of sufficient size to admit both steam and water to the interior of the chamber C, while the pipe F, which conveys the steam from the boiler to the engine, is connected with the interior of the chamber C near its central part, instead of leading from the upper part of the boiler, so that all of the steam used leaves the boiler by passing through the lateral openings *c c* and through the scum-collecting chamber C. The result of this arrangement is that as the steam passes into the chamber C on its way to the engine it tends to create a current inward through the openings *c* at the water-level, and to carry into the chamber anything floating upon the surface of the water; consequently the scum which rises to the surface of the water is immediately drawn into the chamber C as fast as it forms and before it has sufficient time to adhere to the shell of the boiler, and the mud and other impurities are thus caused to deposit within the chamber C, from which they can be readily removed by opening the blow-off cock D; or, should the deposit adhere to the interior of the chamber with sufficient tenacity to resist the action of blowing off, the hand-hole cap can be taken out and the incrustation removed by means of a suitable scraper.

When the cock D is opened the water, scum, and mud in the chamber are immediately ejected through the blow-off pipe by the pressure of steam, and the water at the surface of the boiler is also blown off clear without materially lessening the quantity of water within the boiler, so that the operation can be performed as many times during the day as may be required, and this, too, without stopping the engine or interfering with the constant working of the boiler.

The size of the scum-collecting chamber C and the number of openings *c* may be arranged to suit the requirements of the boiler in which they are to be used, a chamber of eighteen inches being sufficient for an ordinary boiler of four or five feet diameter.

The openings *c* may simply be cut through the shell of the chamber; but I prefer to extend them toward the sides of the boiler in the form of tubes or funnels, as indicated in the drawings. If desired, the chamber C may be placed outside the boiler-shell, the openings *c* being formed through said shell to the interior.

When two boilers are used together, the chamber C may be arranged between the two, and be connected to each by pipes H at the water-line, as illustrated in Fig. 3, the steam-pipe F being arranged from the top of the chamber, as shown.

The chamber C may be of other than cylindrical form, or the cylindrical form may be used

in a vertical position, with the openings arranged around the circumference. This latter form would be adapted to upright boilers. In all cases, however, the steam-supply should be drawn from the interior of the chamber C, and the openings *c* should be partially above and partially below the water-level.

By the use of my invention the mud and other impurities which are drawn into the boiler with the water can be quickly removed, leaving the water in the main portion of the boiler clear, thus preventing the formation of scales upon the boiler-shell, and greatly facilitating the operation of the boiler.

Having described my improvement in steam-boilers, what I claim therein as new and of my invention, and desire to secure by Letters Patent, is—

1. The combination, with a steam-boiler, of a scum-collecting chamber connected with the steam-supply pipe, and communicating with the interior of the boiler by openings arranged partly above and partly below the line of water-level, substantially for the purpose set forth.

2. The combination, with the boiler A and steam-supply pipe F, of the scum-collecting chamber C, provided with lateral openings *c*, blow-off cock D, and hand-hole and cap E, substantially as and for the purpose set forth.

CHARLES STEWART.

Witnesses:
CHAS. H. BURLEIGH,
O. C. WHITE.