S. L. Wiegand.

Drop Tube Boiler.

No. 111,596. Patented Feb. 7, 1871.

Fig. 1.

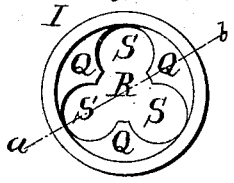


Fig. 2.

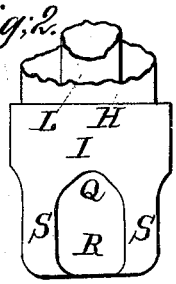


Fig. 3.

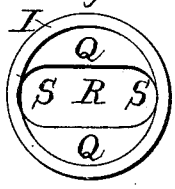


Fig. 4.

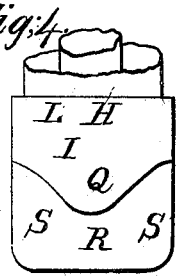


Fig. 5.

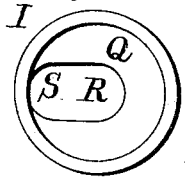


Fig. 6.

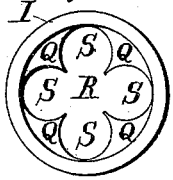
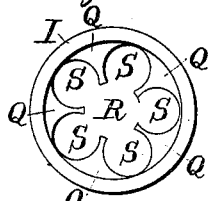


Fig. 7.



Section on line a. b. Fig 1.

Fig. 8.

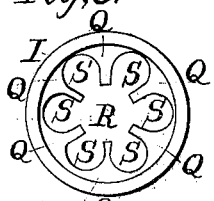


Fig. 9.

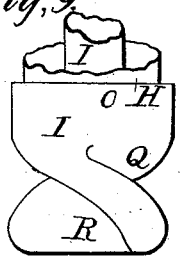


Fig. 10.

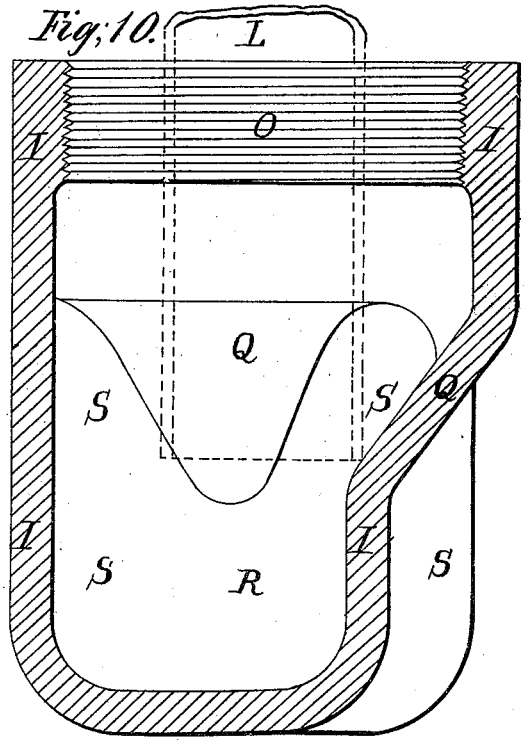
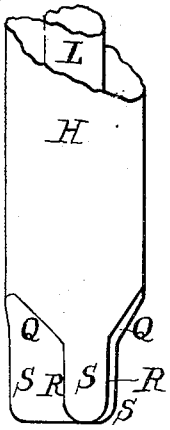


Fig. 11.



Witnesses.

Addison May Fahnestock

John B. Deane

Inventor.

S. L. Wiegand

UNITED STATES PATENT OFFICE.

S. LLOYD WIEGAND, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN DROP-TUBE STEAM-GENERATORS.

Specification forming part of Letters Patent No. **111,596**, dated February 7, 1871; antedated January 23, 1871.

To all whom it may concern:

Be it known that I, S. LLOYD WIEGAND, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Steam-Generators; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing and letters of reference marked thereon.

The nature of my invention consists in an improved cup or other lower termination for closing the bottoms of the tubes forming the heating-surface of steam-generators made with suspended tubes. This cup or termination is of such form that it affords a more free channel or channels for the return of the water from the descending column of the central portion of the tube to the rising column surrounding it.

Figures 1 and 2, respectively, show, in plan and elevation, one of the cups or caps. Figs. 3 and 4 show, in plan and elevation, modified form of the cup. Figs. 5, 6, 7, and 8 show plans of other modifications of the cup, and Fig. 9 shows, in elevation, another form of cup. Fig. 10 shows an enlarged vertical section of a cup; and Fig. 11 shows a tube closed at the lower end by its own material in the same form as the cup.

The construction of the caps I or lower terminations of the tubes H is the peculiarity of this invention. (Most readily seen in Fig. 10.) Below the cylindric portion O, forming the female screw or nut, it is made with a hollow inverted truncated conical or pyramidal body, Q, the base of which is nearly as large as the tube to which it is applied, and it is continued downward in the form of a cylindric or prismatic body, R, closed at the lower end, and of such dimensions as not to permit the lower end of the guides L to enter it.

One or more hollow wings, S, unite the sides of the cylinder or prism R to the sides of the cone Q, and establish a free fluid communication between R and Q through S.

The caps I should be made of nearly uniform thickness of metal in all parts, and as thin as is compatible with the requisite strength.

The advantages of this form of cup over those heretofore used are that a more free flow of current from the bottom to the annular spaces between the guides L and the tubes H is secured. They present no places for the lodgment of sediment, are more easily cast, and are easily held to screw and unscrew them by wrenches of small external dimensions, so that close contiguity does not hinder the unscrewing of them, and, in proportion to the extent of heating-surface they expose, require less weight of material in their production than others heretofore used.

The position of the internal tube or guide in the cap is shown in dotted lines in Fig. 10.

Figs. 3, 4, 5, 7, and 8 show a variety of forms of cups such as I have described, the difference between them consisting in the variations in numbers of wings or channels connecting the bottoms with the conical sides of the several caps.

Fig. 9 shows a cap with the wings of a spiral or twisted form, the effect of which is to produce rotation in the ascending annular water column in the tube to which it is applied, and, by the centrifugal force thus developed, compel a more intimate contact of the water with the heated metal of the tube.

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

A screw-cap for boiler drop-tubes, of uniform or nearly uniform thickness of metal, with internal projections adapted to sustain an inner tube or guide to promote circulation of water, and corresponding external depressions adapted to receive the claws of a wrench.

S. LLOYD WIEGAND.

Witnesses:
ADDISON MAY HAHN,
JOHN B. DEVINE.