

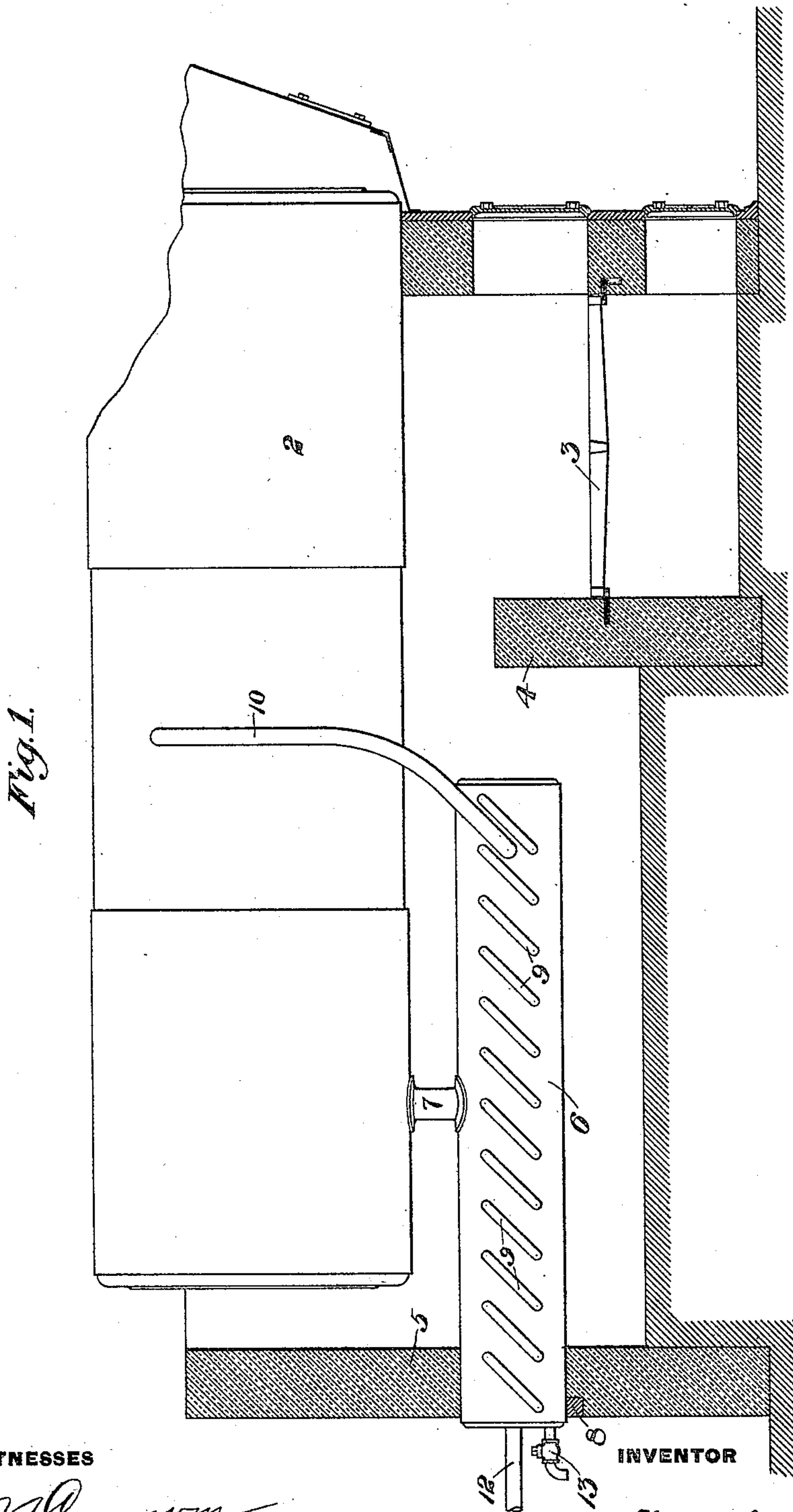
(No Model.)

2 Sheets—Sheet 1.

T. GUNNING.  
STEAM BOILER.

No. 529,529.

Patented Nov. 20, 1894.



**WITNESSES**

J. F. McCombs  
W. B. Conning

**INVENTOR**

Thomas Gunning  
by M. Bakewell & Sons  
his attorneys

(No Model.)

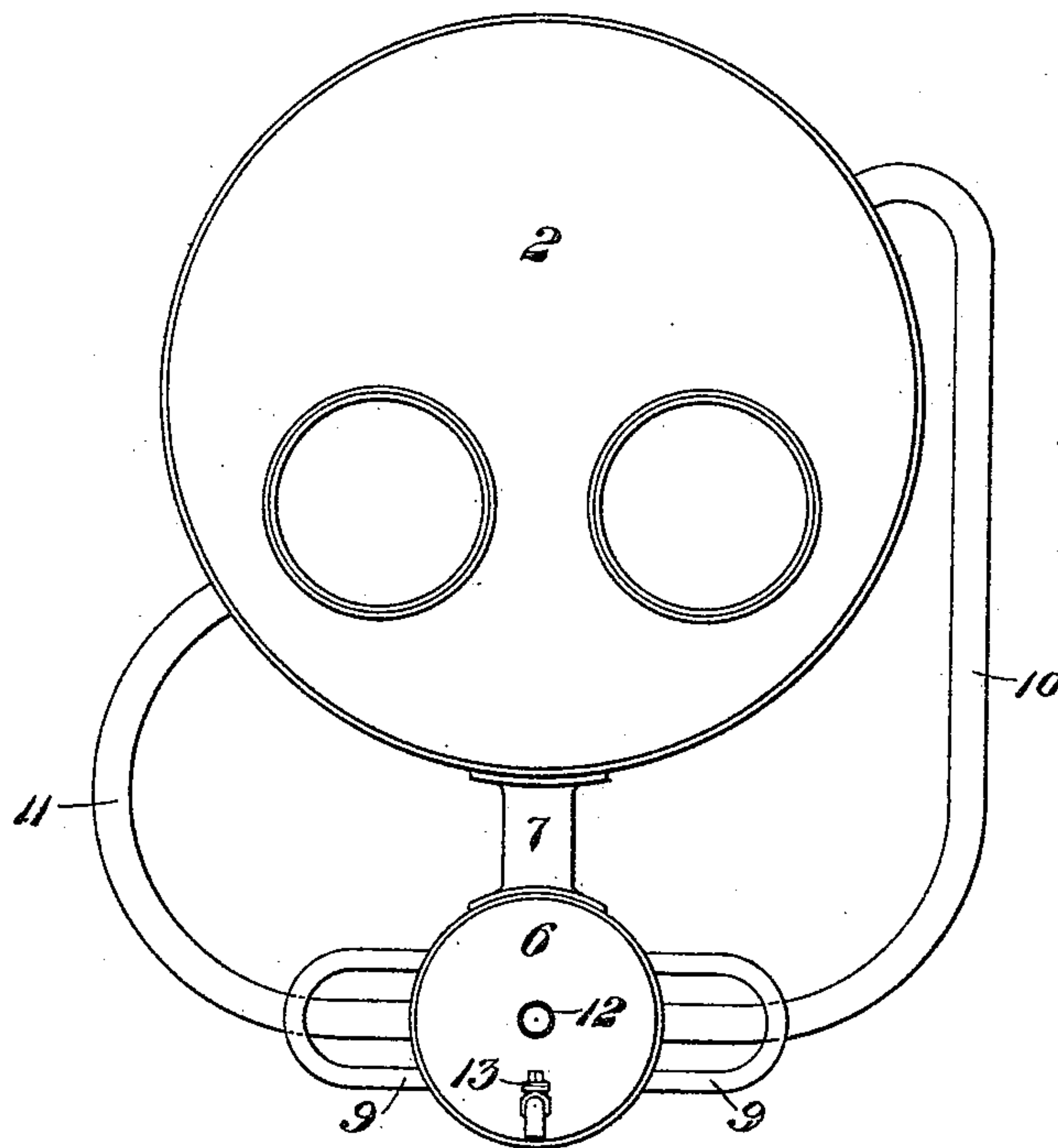
T. GUNNING.  
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*Fig. 2.*



WITNESSES

*J. M. Corwin*  
*W. B. Corwin*

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*Thomas Gunning*  
*by W. Bakewell & Sons*  
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# UNITED STATES PATENT OFFICE.

THOMAS GUNNING, OF PITTSBURG, PENNSYLVANIA.

## STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 529,529, dated November 20, 1894.

Application filed July 12, 1893. Serial No. 480,234. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS GUNNING, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Steam-Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, partly broken away, of my improved boiler; and Fig. 2 is a rear elevation of the same, on a larger scale.

My invention relates to the construction of horizontal steam boilers, and is designed to greatly increase their available heating surface without enlarging the space required for the setting, and at the same time economize in fuel.

In the drawings, 2 indicates an ordinary horizontal tubular boiler, having the usual grate 3, bridge-wall 4, and rear wall 5. Below the boiler proper and at the rear of the bridge-wall, I place a longitudinal drum 6, which is supported by the water leg 7 connecting with the boiler, and rests at its rear end upon a semi-circular plate 8, built into the rear wall. This drum is provided on each side with one or more series of bent return tubes 9, which project therefrom and are inclined as shown in Fig. 1. This drum is also connected with the boiler by two tubes 10 and 11, one of which enters the boiler below and the other above the water line. The drum projects through the rear wall and the feed-water preferably passes thereto through a pipe 12, so that all sediment collects in the drum before passing to the boiler. A suitable blow-off cock 13 is provided for cleaning out the drum when it becomes clogged with scale or sediment.

The advantages of the device result from the

large increase in the heating surface without increase in the space required for the setting. This heating surface may be increased as desired, by adding more tubes and a perfect circulation is insured by the return portion of the tubes, there being no dead-water space. The bend in the tubes I have found makes a perfect expansion joint, so that there is no strain upon these tubes, while expansion of the drum is allowed for by its being free to move rearwardly over the rest-plate.

The device is easily applied to boilers already set up, as all that is necessary is to make a hole in the rear wall of the same size as the drum, slide the drum in, and connect up, the side tubes being inserted and expanded on the inside of the drum.

Many variations in the form and arrangement of the parts may be made by the skilled mechanic without departure from my invention, since

What I claim is—

The combination with a horizontal boiler, of a horizontal drum located beneath the same in the rear of the bridge-wall return-tubes extending laterally from the sides of the drum, the connections of the tubes being out of vertical alignment, a water-leg connecting the drum and boiler, a pipe leading from one side of the drum to the boiler below its water line, and another pipe leading from the other side of the drum to the boiler above its water-line; substantially as described.

In testimony whereof I have hereunto set my hand.

THOMAS GUNNING.

Witnesses:

W. B. CORWIN,  
C. BYRNES.