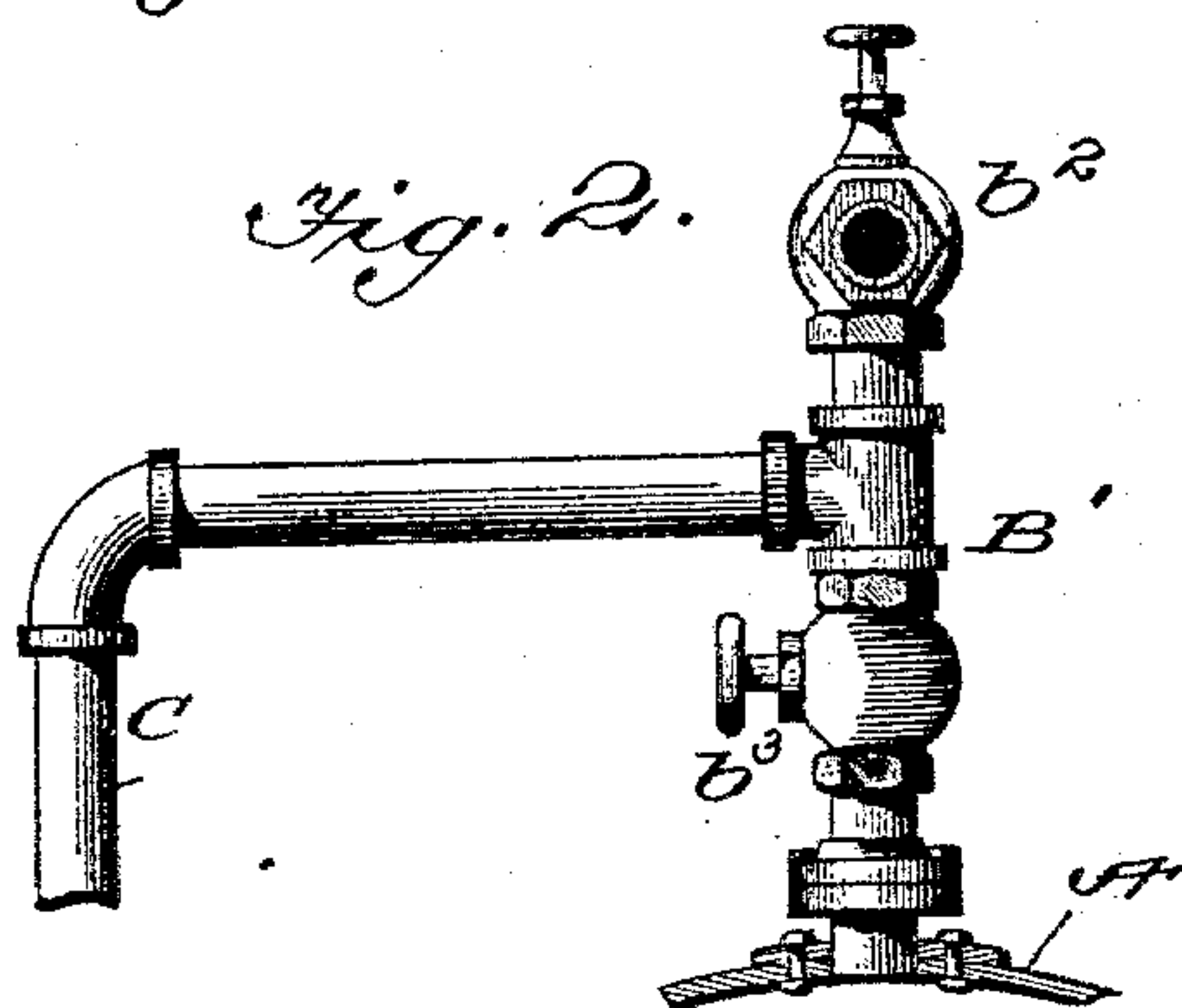
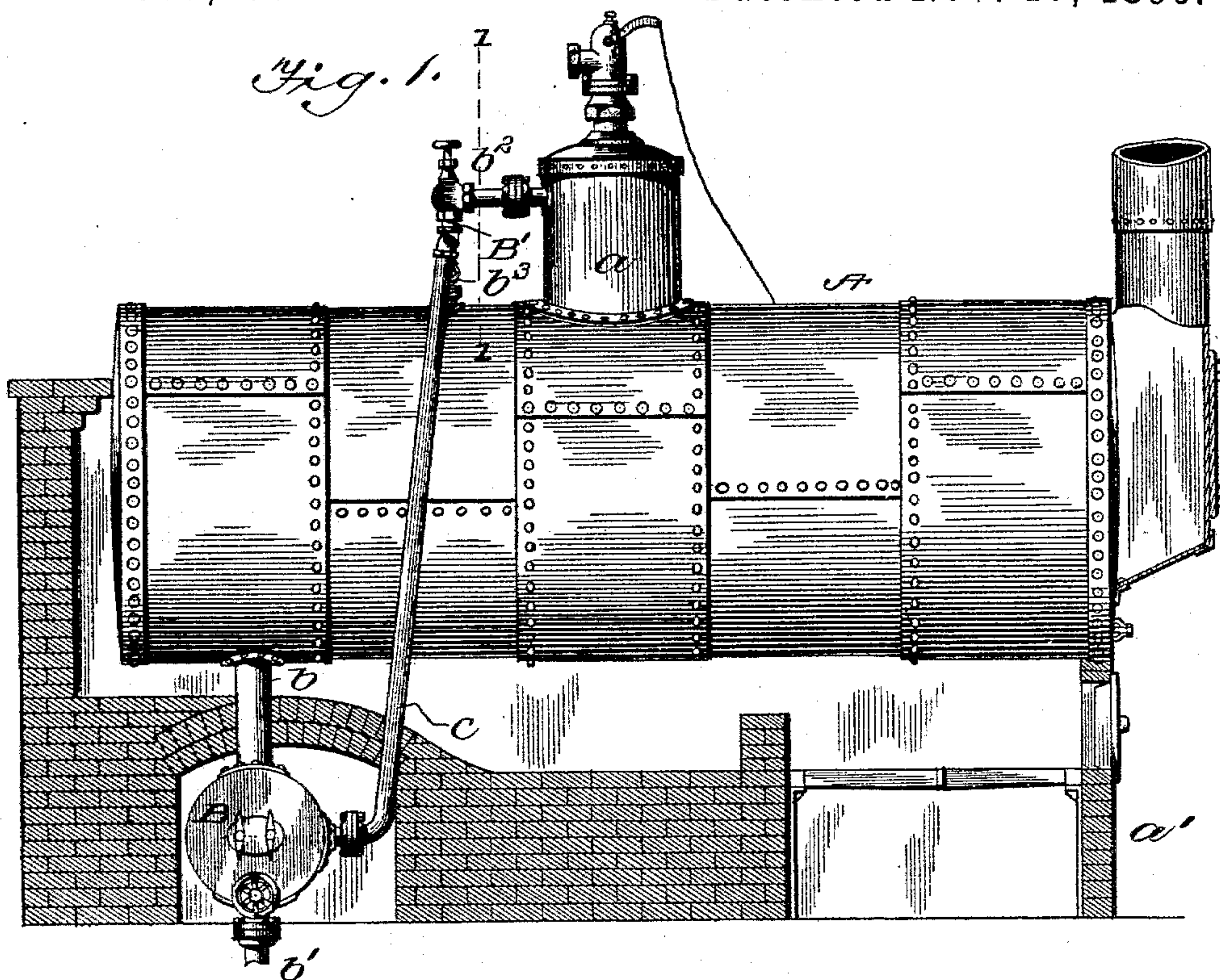


(No Model.)

T. GUNNING.  
STEAM BOILER.

No. 571,660.

Patented Nov. 17, 1896.



Inventor

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Witnesses  
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Wm. D. Dodge



# UNITED STATES PATENT OFFICE.

THOMAS GUNNING, OF PITTSBURG, PENNSYLVANIA.

## STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 571,660, dated November 17, 1896.

Application filed February 10, 1896. Serial No. 578,764. (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 certain  
5 new and useful Improvements in Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and  
10 use the same.

This invention contemplates certain new and useful improvements in steam-boilers.

It has for its object to provide for the constant agitation of the sediment in the boiler,  
15 whereby the same may be prevented from adhering therein, thus increasing the horsepower of the boiler and resulting in a great saving of fuel.

A further object is the production of simple and highly efficient means of maintaining the temperature of the mud-drum at or about the same as that of the boiler or steam-dome, thereby allowing for the expansion of the mud-drum. Ordinarily the mud-drums  
20 of steam-boilers are usually kept at a lower temperature than the boilers, the heat not coming directly in contact therewith. In consequence there is no allowance for expansion and contraction of the mud-drums, and  
25 the sediment collected in the latter adheres to the sides or walls thereof. Hence the mud-drums quickly wear out and their serviceability is quickly impaired. By means of my invention the mud-drums will last as long as  
30 the boilers, and the sediment therein and within the boiler being constantly agitated is prevented from settling and adhering to the walls of the drum and boiler.

These objects I accomplish by means of a  
40 pipe or pipes leading from the mud-drum at a point about on a line with the center of the latter and up around the side of the boiler through the line of passage of the products of combustion and opening into the steam-space  
45 of the boiler or the dome of the latter, whereby constant circulation between the mud-drum and the top of the boiler is had, and the temperature of said mud-drum is maintained at about the same as that of the steam space or  
50 dome of the boiler and sediment is prevented

from settling in the boiler. A blow-off pipe is occasionally opened to permit of the mud and the like being expelled.

The invention will be hereinafter fully set forth, and particularly pointed out in the  
55 claim.

In the accompanying drawings, Figure 1 is a view in side elevation, parts being shown broken away, of a boiler constructed in accordance with my improvements. Fig. 2 is a  
60 detail section on line 1 1, Fig. 1.

Referring to the drawings, A designates a steam-boiler which may be of any preferred construction, *a* the steam-dome, and *a'* the  
65 inclosing wall or housing, preferably formed of brick.

B is a mud-drum located within the lower portion of the housing and communicating with the boiler A by vertical pipes *b*. From this mud-drum leads a blow-off pipe *b'*.  
70

B' designates a right-angular pipe, which at its lower end opens into the steam-space of the boiler and at its upper end into the dome  
75 *a*. In this pipe are upper and lower valves *b<sup>2</sup>* *b<sup>3</sup>*.

C is a pipe which leads diagonally from the pipe B' at a point between the valve thereof and opens at its lower end into the mud-drum B at a point about on a line with the center  
80 of the latter. Steam is admitted from this pipe into the dome by opening the valve *b<sup>2</sup>* and closing valve *b<sup>3</sup>*, or with the latter open and the former closed steam will pass to the steam-space of the boiler. Thus circulation  
85 can be constantly passing from the mud-drum to the boiler, thereby keeping the temperature of the latter the same as the boiler. This circulation-pipe passes up on the outside of the boiler through the line of passage  
90 of the products of combustion, and being directly acted upon and entirely surrounded by the latter the water in said pipe, which is at the same level as the water in the boiler, is quickly heated to a high degree, and the  
95 steam constantly generated therefrom passes through the upper portion of the pipe into the steam-dome of the boiler-shell or directly into the steam-space of the latter, and as the steam is generated in the pipe the water continues to rise therein, remaining always at the  
100



same level as the water in the boiler, the supply being directly from the mud-drum. By thus creating a continuous circulation between the mud-drum and the boiler the temperature of the mud-drum is raised to that of the steam-dome and the constant circulation serves to keep the sediment in the drum continuously agitated and prevents the same from lodging or adhering to the walls of said drum.

The advantages of my invention are apparent to those skilled in the art, and it will be observed that I have provided extremely simple means whereby the mud-drum can be maintained at the same temperature as the steam-dome, thereby allowing for the expansion and contraction of the latter and resulting in prolonging the utility of the mud-drum, and also by reason of this constant circulation sediment is prevented from accumulating on the walls of the drum and boiler, the horse-power

of the boiler is increased, and a saving in fuel is effected.

I claim as my invention—

The combination with a boiler having a steam-dome, and a mud-drum connecting with said boiler, of an angular pipe opening at its ends in said dome and also in the steam-space of the boiler, a valve or valves in said angular pipe, and a pipe leading from said mud-drum into said angular pipe, whereby a constant circulation between said mud-drum and boiler may be maintained, substantially as and for the purpose set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

THOMAS GUNNING.

Witnesses:

CHARLES F. RANKIN,  
CHARLES H. RHODES.