

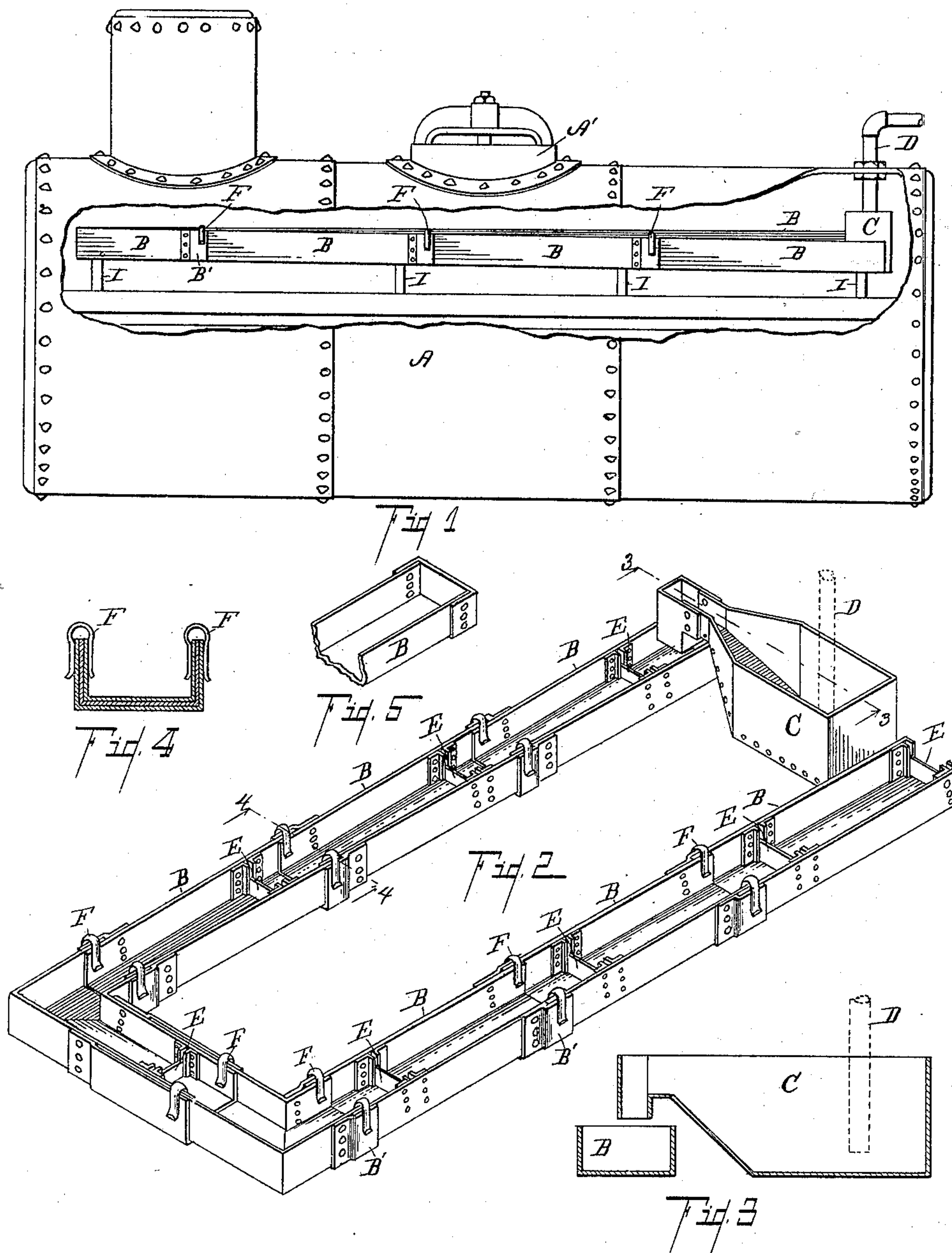
No. 627,198.

Patented June 20, 1899.

C. H. MILLER.  
FEED WATER HEATER AND PURIFIER.

(Application filed Feb. 25, 1897.)

(No Model.)



Witnesses.

W. S. Wood  
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# UNITED STATES PATENT OFFICE.

CHARLES H. MILLER, OF KALAMAZOO, MICHIGAN, ASSIGNOR TO THE FEED WATER PURIFIER COMPANY, OF SAME PLACE.

## FEED-WATER HEATER AND PURIFIER.

SPECIFICATION forming part of Letters Patent No. 627,198, dated June 20, 1899.

Application filed February 25, 1897. Serial No. 625,017. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. MILLER, a citizen of the United States, residing at the city of Kalamazoo, in the county of Kalamazoo and State of Michigan, have invented certain new and useful Improvements in Feed-Water Heaters and Purifiers, of which the following is a specification.

My invention relates to improvements in internal feed-water heaters and purifiers, and particularly to improvements in that class of internal feed-water heaters and purifiers shown and described in the Patent No. 569,362, issued to Jacob Struben October 13, 1896.

The objects of this invention are to provide an improved internal feed-water heater and purifier which can be inserted and removed from the boiler and which when placed in the boiler will be toward the outside of the same, so that it shall be easily accessible to a man entering at the manhole of the boiler, particularly in the case of horizontal boilers; second, to provide an internal feed-water heater and purifier which can be easily taken apart and joined together again in sections; third, to provide an improved feed-water heater and purifier in which the retarding-partitions are easily removable to facilitate the cleaning of the same, and, fourth, to provide an improved feed-water heater and purifier in which the passage-way for the same is extended out in a single trough, so that the water introduced in one part will not have the effect of cooling the water in another part adjacent, as in the construction above referred to. Further objects will appear in the detailed description. I accomplish these objects of my invention by the devices and means described in the following specification, pointed out in the claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a horizontal boiler with a portion of its walls broken away to show one of my improved feed-water heaters and purifiers. Fig. 2 is an enlarged detail perspective view of the feed-water heater and purifier removed from the boiler, the supporting-bridging not being shown. Fig. 3 is an enlarged detail sectional view on line 3 3 of Fig. 2, showing the construction of the re-

ceiver-pan for the feed-water heater. Fig. 4 is a transverse sectional view taken on line 4 4 of Fig. 2. Fig. 5 is an enlarged detail view of the end of the trough, showing a modification.

In the drawings similar letters of reference refer to similar parts throughout the several views, all of the sectional views being taken looking in the direction of the little arrows at the ends of the section-lines.

Referring to the lettered parts of the drawings, A represents the boiler in the usual form. A' is the manhole thereof in the usual partition.

D is a supply-pipe leading into the boiler from any desired position, preferably from the top.

C is the receiving-pan, into which the water is to be delivered.

A long trough, in which the feed-water is heated and purified, is made up in sections B B B B. Around one end of each section is secured an additional sheet-metal plate B', which is securely riveted or joined thereto, leaving an open space between the ends of the same and the section. This is to receive the end of the next section B. When the next section B is inserted into the same, the split keys F are fitted over the two parts and join the same securely together. Low partitions E E are inserted into suitable guide-ways or ways at intervals in the trough formed of the sections B to retard the flow of water there-through. These partitions are lifted out by the engineer or his assistant, and the slime and incrusting material that are deposited therein can then be easily washed out of the same into a pail or the lower part of the boiler, where it is washed out in the usual way. A spout is formed on receiving-pan C, having a suitable deflector to throw the water down into the trough formed by the sections B. It will be observed that the water is pumped through the delivery-pipe D into the pan C, where it immediately overflows into the trough formed by the sections B, and the water is retarded step by step until it passes around through the same, as will clearly appear from an inspection of the view shown in Fig. 2. An examination of the view shown in Fig. 1 indicates that the front end of the



trough is a little raised above the opposite end to insure a prompt flow of the water from one compartment to the next as it passes through the heater. This device has advantages over  
 5 any other in that the cold water introduced has no effect on the adjacent troughs until it overflows, and a broad surface is exposed for the overflow to secure a quick heating and consequent complete precipitation of all in-  
 10 crusting material.

I desire to state that my improved heater and purifier can be in a single section or might be joined together by other means, though the means I have shown is preferred by me.  
 15 Where the manhole of the boiler admits, the sections could be made very much larger, and in fact where the manhole is in the end of the boiler the whole could be made in two sections and separated at the middle of the end  
 20 where the long telescopic joint is shown, suitable partitions being placed within the same, as before. The receiving-receptacle C for receiving the water might be integral with the remaining parts of the device. The pipe D  
 25 could be made to deliver directly in the end of the sections B and work very satisfactorily. It is preferred to provide some means to prevent the slopping over of the water.

The exact material from which my device is  
 30 constructed is not essential. It may be sheet metal, cast metal, wood, pottery, or other material, some good conductor being preferred.

The exact form of the trough in cross-sections can be varied. The same may be rounded

like an eaves-trough or may be made any  
 35 other desired shape. The exact form I have shown, however, is preferred and possesses great advantage over any other.

Having thus described my invention, what I claim as new, and desire to secure by Letters  
 40 Patent, is—

1. In an internal feed-water heater and purifier the combination of a trough made up of sections B, having slip-joints between them  
 45 formed by the strip B'', and retained by the split keys F, thereon; partitions E, removably supported in suitable guides in said trough; a receiving-pan C, with a spout opening into said trough; and a suitable supply-  
 50 pipe opening into said receiver coacting as specified.

2. In an internal feed-water heater and purifier, the combination of a casing forming a long continuous single trough; suitable removable partitions extending transversely  
 55 across the same at intervals extending to near the top thereof, dividing the same into compartments; and a suitable supply-passage leading into the same to deliver water so that it shall flow through by the force of gravity  
 60 for the purpose specified.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

CHARLES H. MILLER. [L. S.]

Witnesses:

W. S. WOOD,  
 D. E. WOOD.