

Nov. 16, 1937.

C. GRAHAM

2,099,062

WATER CLARIFIER

Filed May 20, 1936

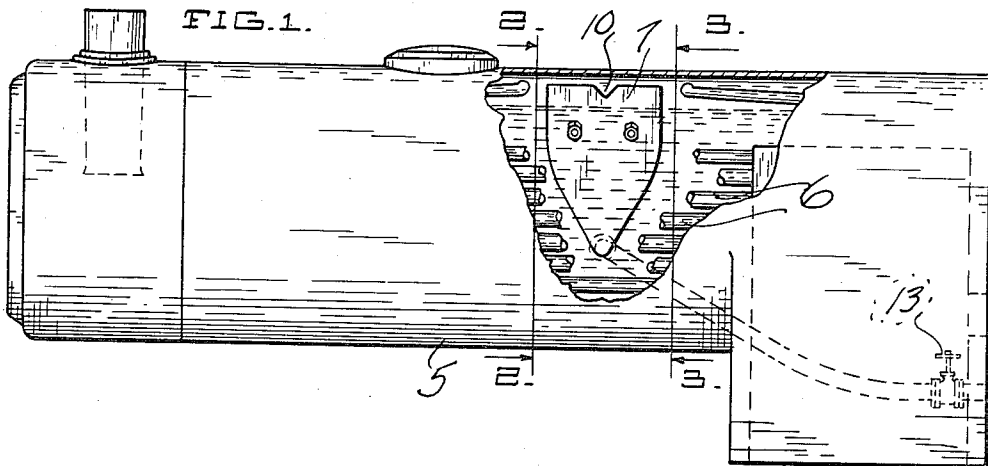


FIG. 2.

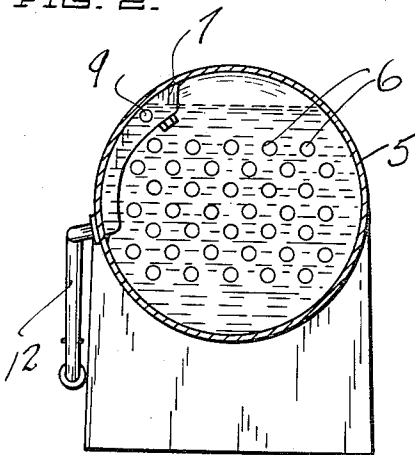


FIG. 3.

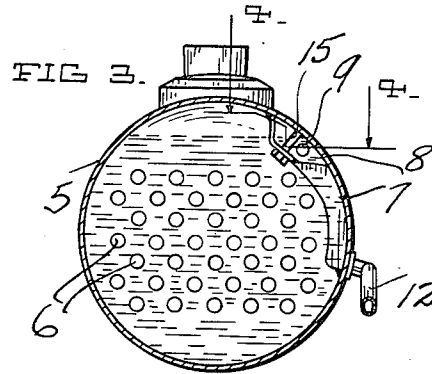
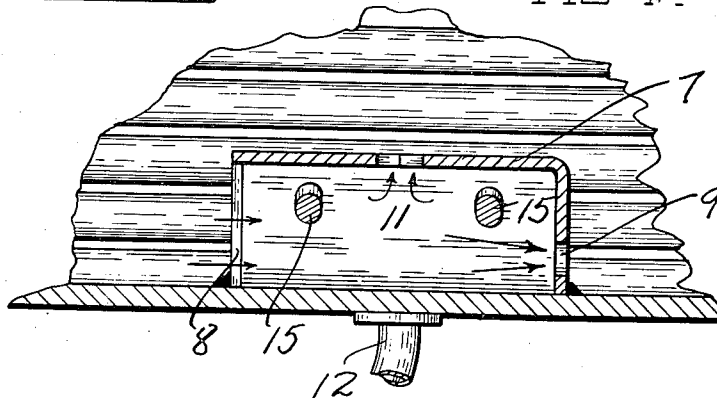


FIG. 4.



INVENTOR.
CHARLES GRAHAM.
BY *Victor J. Evans & Co.*
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,099,062

WATER CLARIFIER

Charles Graham, Stockton, Calif.

Application May 20, 1936, Serial No. 80,879

2 Claims. (Cl. 122—389)

This invention relates to a device which will keep the water within a locomotive type boiler clean, and is known as a "water clarifier" for locomotive type boilers. The principal object of this invention is to provide means for removing scale and other foreign matter from the water in a locomotive boiler.

A further object is to produce a device of this character which may be readily installed in the ordinary locomotive boiler without altering its construction.

A still further object is to produce a device of this character which is economical to maintain and one which will not interfere with the water circulation in the boiler in any way.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawing forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Fig. 1 is a side elevation of a locomotive boiler and having my invention applied thereto;

Fig. 2 is a cross sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a cross sectional view taken on the line 3—3 of Fig. 1; and

Fig. 4 is an enlarged fragmentary detailed view taken on the line 4—4 of Fig. 3.

Locomotive boilers are dependent upon water gathered from many localities, some of which water is soft, other, hard. As a result, chemicals in these waters deposit foreign matter which, unless removed, effects the steaming of the water.

It is my intention, therefore, to provide within the boiler a trap through which the water will gradually pass and deposit therein any foreign matter being circulated.

In the accompanying drawing wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 5 designates a locomotive boiler as a whole, having the customary fire tubes 6. Due to the high heat, this water is always boiling and, therefore, circulating, the path of circulation being fairly definite in the boiler. Therefore, by placing a receptacle 7 to one side thereof and positioning the same within the path of circulation of the water, I am enabled to cause this water to pass through the receptacle. This receptacle is preferably welded to the boiler and has a V-vent 10 near its top to allow steam to escape back to the boiler. By referring to Figs. 2 and 4, it will be noted that a portion of one end of the receptacle is open, as shown at 8 and that a small opening

9 is formed at the opposite end of the receptacle. The bottom of this opening is above the bottom of the large opening and below the water level. A pocket or sump is formed at 11 and to this sump is attached a blow off pipe 12 which is controlled by a valve 13. Stay bolts 15 may be employed, if desired, to help absorb vibration.

During the steaming in the boiler, the circulation is such that the water flows in, as shown in the arrow in Fig. 4 toward the left of the drawing, wherein the speed of flow is slowed down with the result that heavy particles of foreign matter will be deposited in the sump 11, and the water will then flow out through the opening 9, as indicated by the arrow at the right of the drawing. Other openings may be formed in the side wall of the receptacle, if so desired.

The result of this construction is that when the boiler is working, the water will flow into the receptacle 7 through the large opening 8, the water carrying with it the sludge or foreign matter. As the water passes over the static water within the receptacle, it slows up. This slowing up or retarded action is accomplished by means of the small bleeder hole in front. This bleeder hole is slightly higher than the lowest part of the large intake opening 8 and, accordingly, has a much smaller capacity than the intake. Therefore, as the water passes in contact with the static water, it precipitates the foreign matter into the dead water. This foreign matter will then settle into the lower regions and is blown out of the tail pipe or blow off pipe 12 as frequently as is deemed necessary.

While I have shown but one of the receptacles, it is obvious that the device may be installed on the right or left side of the boiler, or on both sides. It has been found from experience that large boilers will require two receptacles, one on each side of the boiler.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that various changes relative to the material, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:—

1. The combination with a locomotive type boiler, of a receptacle positioned therein, comprising a curved casing conforming vertically to the curvature of and secured against the side wall of the boiler shell and depending at its lower end between the boiler tubes and said side wall of the boiler shell to form a sump provided with

a blow off tube extending through said side wall, one end of the casing having an enlarged opening the bottom of which is below the normal water level of the boiler, the opposite end of the casing having a bleeder opening smaller than and above the bottom of said opening.

2. The combination stated in claim 1, the casing being without a wall on the side next to the boiler shell and the edges of the casing fitting water-tight against said shell which thus forms the outer wall of the receptacle.

CHARLES GRAHAM.