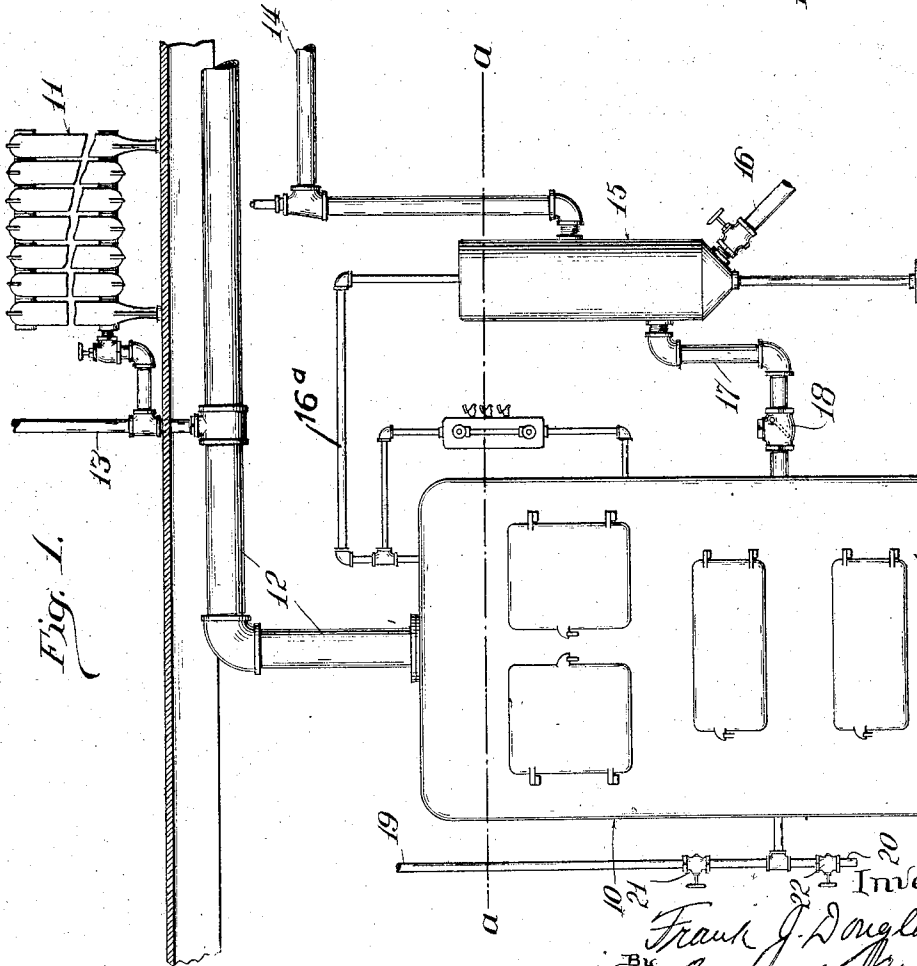
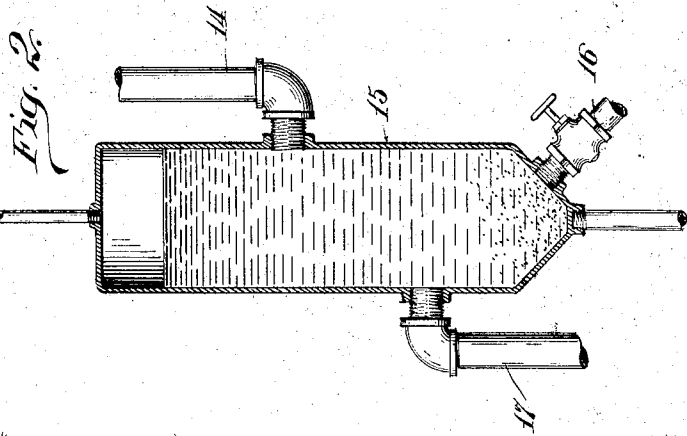


Oct. 18, 1927.

1,645,522

F. J. DOUGLASS
STEAM HEATING APPARATUS

Filed June 1, 1926



Inventor
Frank J. Douglass
By *Barnes & Munn*
Attorneys

UNITED STATES PATENT OFFICE.

FRANK J. DOUGLASS, OF CHICAGO, ILLINOIS.

STEAM-HEATING APPARATUS.

Application filed June 1, 1926. Serial No. 112,852.

My invention relates to steam heating apparatus. In the fabrication of radiators, pipings, valves, boilers and other parts of steam heating apparatus certain quantities of dirt, grease, core sand, and such like substances are certain to be left in the different parts of the apparatus despite all efforts of manufacturers to deliver the apparatus in clean condition. If this foreign matter, especially where it is of a greasy character like molder's sand, is allowed to enter or to remain in the boiler (and the interior surfaces of boilers, especially cast boilers, are not likely to be entirely free from such substances), the boiler is prevented from steaming readily, the water line is liable to fluctuate, and the water is likely to surge out of the boiler into the supply pipe; the presence of a floating scum of a greasy character in the boiler interfering in these and in other ways with the proper operation and control of the heating apparatus.

One of the principal objects of my invention is to prevent such foreign substances in radiators, piping valves, etc. from entering the boiler, and to collect such substances and discharge the same from the apparatus.

Another object of the invention is to provide means whereby the boiler itself may be cleaned, either when the apparatus is first installed, or from time to time subsequently if such cleaning is necessary.

The invention is illustrated in the accompanying drawing, in which—

Fig. 1 is a fragmentary view, in elevation, of a heating apparatus constructed in accordance with my invention; and

Fig. 2 is a sectional view of the dirt trap forming a part of the apparatus.

Referring to the drawing, 10 designates a steam boiler, the normal water level in which is indicated by the line *a—**a*. 11 indicates one of the radiators of the radiating system of the apparatus. Steam passes from the boiler to the radiating system through a steam supply pipe 12 and one or more risers 13. 14 designates the return pipe from the radiating system which (the system indicated in the drawing being a one-pipe system) is a continuation of the supply pipe 12.

Interposed between the radiating system and the boiler, on the return side of the radiating system, is a dirt trap 15 provided in its conical bottom with a valved discharge outlet pipe 16. Preferably an equalizing

pipe 16^a extends from the top of the boiler 10 to the top of the dirt trap 15 so that the water level is the same in the boiler and in the dirt trap. This pipe also serves as an emergency return to the boiler in case valve 18, for example should fail to open as intended. The return pipe 14 of the radiating system enters the dirt trap above the bottom thereof and preferably below the water level, indicated by the line *a—**a* so that the entry of water into the trap does not disturb any scum or floating impurities on the water standing in the trap. A pipe 17 leads from the dirt trap 15, below the water level therein, and preferably below the connection of pipe 14, but a substantial distance above the bottom of the dirt trap, to the boiler 10, this pipe 17 being provided with a check valve 18. 19 is the water feed pipe for the boiler and 20 a blow off pipe, these pipes being provided with valves 21, 22.

The operation of the apparatus is as follows:

Dirt, grease, scale, core sand and the like from the piping radiators and other fittings are carried through return pipe 14 into the dirt trap 15. Here a separation takes place. The heavier substances are precipitated to the bottom of the dirt trap. The lighter substances, such as grease or dirt or sand mixed with or impregnated with grease, float to the top of the water in the dirt trap. As a result, only pure water flows from the dirt trap to the boiler through pipe 17. The foreign substances collected in the dirt trap may be discharged from the apparatus by opening the valve in pipe 16.

In order to remove from the boiler any grease or dirt which it may contain when first installed or which may subsequently enter the boiler, valve 21 in the feed pipe 19 is opened with the steam in the boiler at a low pressure, but with the fire under the boiler going. The water is let into the boiler rather slowly until it is completely filled and overflows into the steam supply pipe 12. In this way, any scum that there may be on the surface of the water in the boiler is carried over into and through the supply pipe and thence to the dirt trap 15. The valve in the discharge pipe of the dirt trap is opened so that any foreign matter entering the dirt trap is discharged therefrom. The dirt trap drain valve is then closed, the valve 21 in the water feed pipe closed and

valve 22 in the boiler or blow-off pipe 20 opened, so as to reduce the water level in the boiler to the normal level.

The invention is shown and described in a preferred embodiment, but the intention is to cover all modifications within the scope of the appended claims.

I claim:

1. In a steam heating apparatus the combination of a radiating system having a return pipe, a boiler, a dirt trap, the upper end of which extends above the normal water level of the boiler, into which said return pipe discharges, and pipes connecting the dirt trap with the boiler at points above and below the normal water level in the boiler, whereby the water stands at the same level in the trap and boiler, the pipe connected with the boiler below the water level being connected with the trap at a point above the bottom thereof and below the normal water level therein.

2. In a steam heating apparatus the combination of a radiating system having a return pipe, a boiler, a dirt trap, the upper end of which extends above the normal water level of the boiler, into which said return pipe discharges, and pipes connecting the dirt trap with the boiler at points above and below the normal water level in the boiler, whereby the water stands at the same level in the trap and boiler, the pipe connected with the boiler below the water level being connected with the trap at a point above the bottom thereof and below the normal water level therein and a valve in said last named pipe opening toward the boiler.

3. In a steam heating apparatus the combination of a radiating system having a return pipe, a boiler, a dirt trap, the upper end of which extends above the normal water level of the boiler, into which said return pipe discharges, a discharge pipe leading from the bottom of the dirt trap, a valve in said pipe and pipes connecting the dirt trap with the boiler at points above and below the normal water level in the boiler, whereby the water stands at the same level in the trap and boiler, the pipe connected with the boiler below the water level being connected with the trap at a point above the bottom thereof and below the normal water level therein.

4. In a steam heating apparatus the combination of a radiating system having a return pipe, a boiler, a dirt trap, the upper end of which extends above the normal water level of the boiler, into which said return pipe discharges, and pipes connecting the dirt trap with the boiler at points above

and below the normal water level in the boiler, whereby the water stands at the same level in the trap and boiler, the pipe connected with the boiler below the water level and said return pipe being connected with the trap at points above the bottom of the trap and below the normal water level in the trap.

5. In a steam heating apparatus the combination of a radiating system having a return pipe, a boiler, a dirt trap, the upper end of which extends above the normal water level of the boiler, into which said return pipe discharges, and pipes connecting the dirt trap with the boiler at points above and below the normal water level in the boiler, whereby the water stands at the same level in the trap and boiler, the pipe connected with the boiler below the water level and said return pipe being connected with the trap at opposite sides thereof and at points above the bottom of the trap and below the normal water level in the trap.

6. In a steam heating apparatus the combination of a radiating system having a return pipe, a boiler, a dirt trap, the upper end of which extends above the normal water level of the boiler, into which said return pipe discharges, and pipes connecting the dirt trap with the boiler at points above and below the normal water level in the boiler, whereby the water stands at the same level in the trap and boiler, the pipe connected with the boiler below the water level and said return pipe being connected with the trap at points above the bottom of the trap and below the normal water level in the trap, the return pipe at a higher elevation than the pipe leading to the boiler.

7. In a steam heating apparatus the combination of a radiating system having a return pipe, a boiler, a dirt trap, the upper end of which trap extends above the normal water level of the boiler, into which trap said return pipe discharges, a discharge pipe leading from the bottom of the dirt trap, a valve in said pipe and pipes connecting the dirt trap with the boiler at points above and below the normal water level in the boiler, whereby the water stands at the same level in the trap and boiler, the pipe connected with the boiler below the water level and said return pipe being connected with the trap at opposite sides thereof and at points above the bottom of the trap and below the normal water level in the trap, the return pipe at a higher elevation than the pipe leading to the boiler.

FRANK J. DOUGLASS.