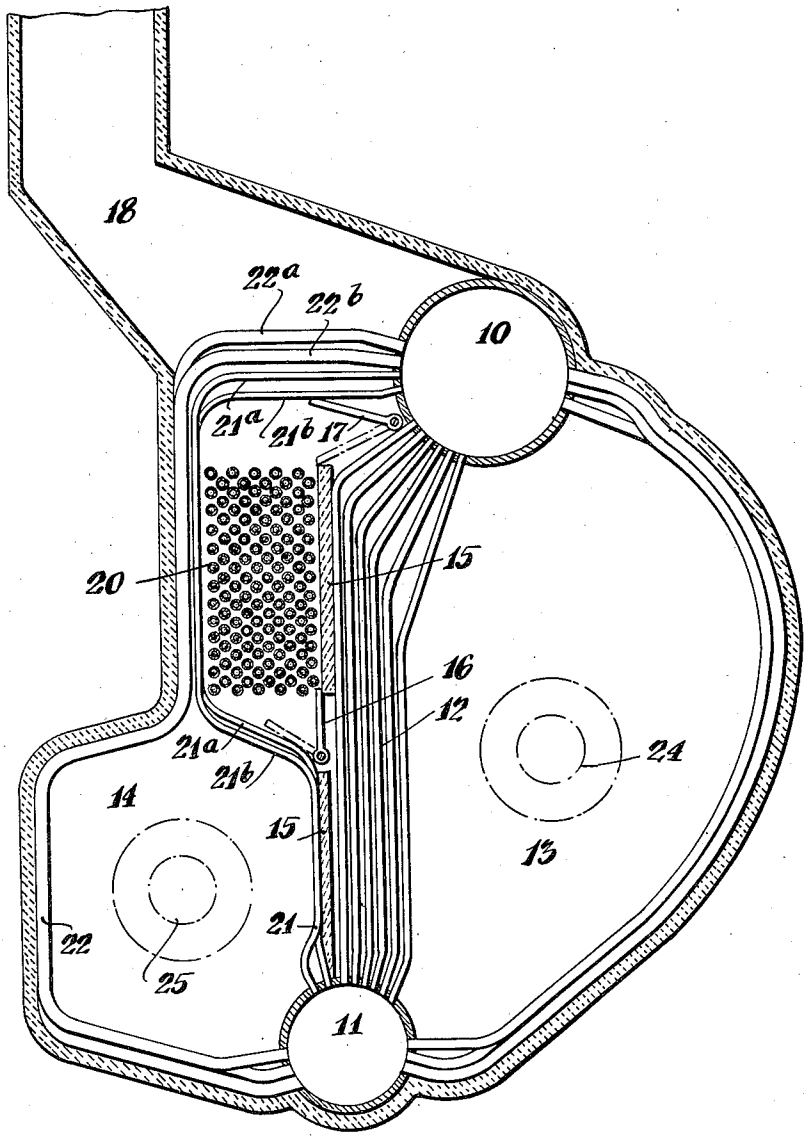
Dec. 12, 1939. J. A. BARNES 2,182,783

SUPERHEATER BOILER

Filed March 9, 1938




INVENTOR

John A. Barnes

BY O. V. Kiee

ATTORNEY

Patented Dec. 12, 1939 2,182,783

# UNITED STATES PATENT OFFICE

2,182,783

## SUPERHEATER BOILER

John A. Barnes, Chappaqua, N. Y., assignor to The Superheater Company, New York, N. Y.

Application March 9, 1938, Serial No. 194,757

4 Claims. (Cl. 122—336)

The present invention relates to steam generating boilers and particularly to boilers equipped with superheaters.

A feature of the present invention resides in an improved boiler and superheater construction permitting regulation of the temperature of superheated steam independently of changes in the rate of firing to generate varying quantities of steam as the load on the boiler fluctuates.

A second feature resides in the construction which affords full protection to the superheater when the boiler is being fired up.

Other features and advantages of the invention will become apparent upon consideration of the following description and appended claims when read in conjunction with the accompanying drawing in which the single figure is a diagrammatic elevational view of an illustrative embodiment of the invention.

The boiler shown in the drawing has a steam and water drum 10 disposed above and connected to the water drum 11 by a generating bank 12 comprising tubes arranged in parallel rows. The exterior walls of the boiler setting are arranged to form separate furnace chambers 13 and 14 at each side of the drums 10, 11, that is at opposite sides of the generating bank 12. A baffle 15 extending from the water drum 11 upwardly to the steam drum 10 along the outer side of the bank 12 is formed with a pair of gas outlets controlled by dampers 16 and 17 for regulating the flow of gases from chamber 13 across the generating bank 12 to the offtake 18 of the boiler. The baffle 15 at its lower portion also prevents the products of combustion flowing from one furnace chamber to the other.

The boiler is provided with a superheater having its heat absorbing elements 20 disposed above and in the path of gases flowing from chamber 14 to the outlet 18 and mounted in a position between the gas outlets from chamber 13 that are controlled by the dampers 16 and 17. The tubes 21 of a row connected between the drums 10 and 11 beyond baffle 15 have portions offset laterally from the bank 12 toward the chamber 14 so as to embrace the group of superheating elements 20. Adjacent tubes 21 in this outermost row have the portions 21*a*, 21*b* thereof which lie above and below the superheater offset vertically to allow the passage of gases from chamber 14 across the superheater to the outlet 18. In similar manner the tube portions 22*a* and 22*b* of a row of tubes 22 that line the outer wall and bottom of the furnace 14 are spaced vertically where they cross the gas outlet.

Individual firing means 24 and 25 are provided for the chambers 13 and 14 respectively. With the arrangement of heating surfaces shown in the drawing it will be seen that when firing up the boiler it is necessary to employ only the burners 24 for chamber 13. With the damper 16 closed and damper 17 open the gases passing over the generating bank 12 from chamber 13 do not affect the superheater 20 which consequently is fully protected at this time. At high loads all the heat produced in chamber 13 may be utilized for generating steam and the temperature of superheated steam may be independently regulated by varying the rate of fuel supply to the burners 25 for chamber 14. Under conditions where it is desired to generate less steam the damper 17 may be moved toward closed position as the damper 16 is opened so that part of the gases produced in chamber 13 are directed across the superheating elements 20. Under such conditions the firing rate of burners 25 may be reduced so that with the lower load a desired constant superheat temperature may be maintained.

Although an illustrative embodiment of the invention has been shown and described in detail, it is to be understood that various changes and modifications may be made without departing from the invention as defined in the appended claims.

What I claim is:

1. In a water tube boiler having an upper and a lower drum interconnected by a substantially vertically disposed bank of generating tubes, means defining a furnace chamber at one side of said bank and a gas offtake at the other side of said bank; baffling means at said other side of said bank extending between said drums and formed with a pair of spaced damper controlled outlets for the passage of gases from said chamber to said offtake; a superheater having its heat absorbing element mounted at said other side of said bank in a position between said outlets so as to lie in the path of gases from one of said outlets; means defining a second furnace chamber located so that the gases therefrom pass over said superheater elements to said offtake; and fuel firing means individual to said chambers.

2. In a water tube boiler having an upper and a lower drum interconnected by a bank of generating tubes; a gas offtake; means defining two separate furnace chambers at opposite sides of said bank so arranged that gases from one of said

chambers contact said bank tubes in passing to said offtake; a superheater positioned so that all the gases from the other of said chambers flow over its heat absorbing elements; baffle means separating said chambers for preventing gas flow from said one chamber to said other chamber; movable dampers forming part of said baffle means and so located with respect to said superheater that gases from said one chamber may be directed across said superheater; and fuel burning means individual to said chambers.

3. In a water tube boiler having an upper and a lower drum interconnected by a bank of generating tubes; a gas offtake; means defining two separate furnace chambers at opposite sides of said bank so arranged that gases from a chamber at one side of said bank pass over said bank tubes in flowing to said offtake; a superheater mounted at the other side of said bank and positioned so that gases from the other of said chambers contact its heat absorbing elements; baffle means extending between said drums and including a damper located below the position of said superheater for directing part of the gases from said one chamber across said superheater; and fuel burning means individual to said chambers.

4. In a water tube boiler having parallel upper and lower drums interconnected by a generating bank, means defining two separate furnace chambers at opposite sides of said bank; individual means for burning fuel in said chambers; an offtake for said chambers; a superheater or the like having its heat absorbing elements positioned above one of said chambers to be heated by gases flowing from the latter to said offtake; a row of fluid circulating tubes connected to said drums having portions offset laterally into the space above said one chamber and embracing said superheater and contiguous substantially vertical portions arranged along that side wall of said chamber which is adjacent said generating bank, parts of said offset portions located below and above said superheater being arranged to permit the flow of gases from said chamber across said superheater to said offtake.

JOHN A. BARNES.