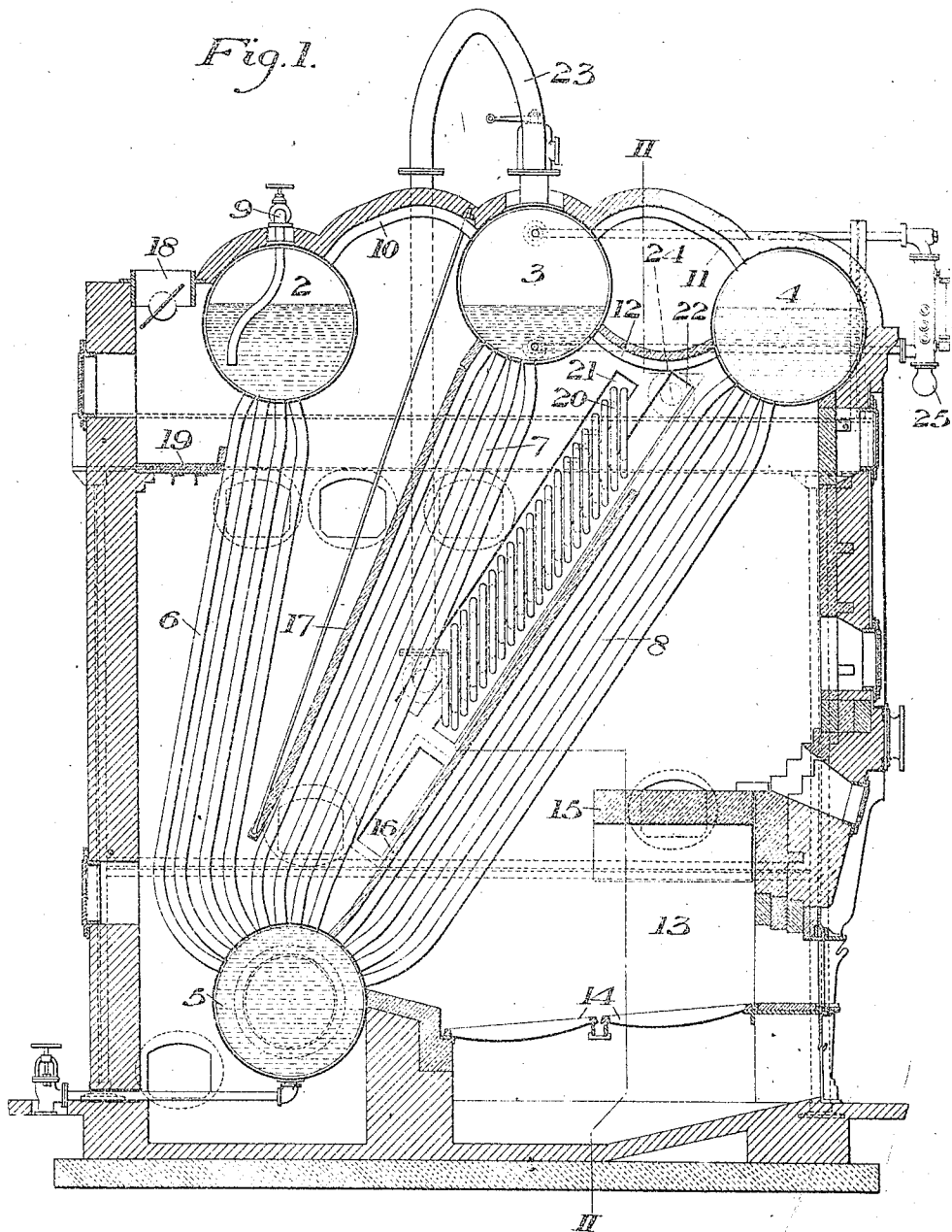


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 SUPERHEATER BOILER.  
 APPLICATION FILED SEPT. 11, 1907.

938,449.

Patented Oct. 26, 1909.  
 2 SHEETS—SHEET 1.



WITNESSES

*W. W. Swartz*  
*Robert L. Mariss*

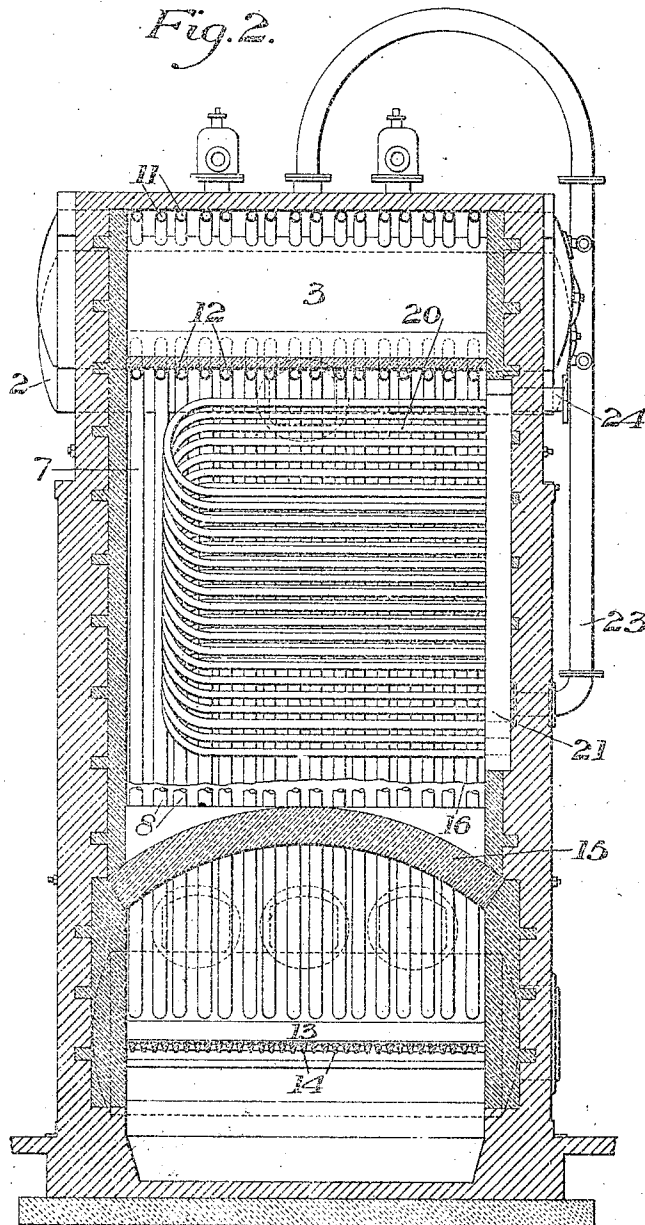
INVENTOR

*E. H. Wells*  
 by *Robert, Byrnes & Parmelee*  
 his Attys.

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*W. W. Swartz*  
*Master Samaras*

INVENTOR

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*by Behrman, Byrnes & Parmelee,*  
*his Attys.*

# UNITED STATES PATENT OFFICE.

EDWARD H. WELLS, OF MONTCLAIR, NEW JERSEY, ASSIGNOR TO THE BABCOCK & WILCOX COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

## SUPERHEATER-BOILER.

938,449.

Specification of Letters Patent.

Patented Oct. 26, 1909.

Application filed September 11, 1907. Serial No. 392,298.

*To all whom it may concern:*

Be it known that I, EDWARD H. WELLS, of Montclair, Essex county, New Jersey, have invented a new and useful Improvement in Superheater-Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section showing one form of my improved superheater boiler; and Fig. 2 is a section on the irregular line II—II of Fig. 1.

My invention relates to the applying of superheaters to water tube boilers of the vertical type having transverse steam and water drums connected by banks of tubes to a transverse mud drum or drums, the gases being given serial up and down passes over the tubes by means of baffles.

The object of my invention is to provide an improved arrangement of the superheater, particularly one of the U-shaped type.

Heretofore in this general design of boiler where the superheaters have been composed of a series of U-shaped loops connected to headers placed in the side wall of the furnace, the plane of the loops has been perpendicular to the headers. As the result of this arrangement, the tubes are apt to sag when overheated. This is overcome by my invention, in which the tubes are arranged in a substantially vertical plane, as hereinafter more fully described.

Referring to the accompanying drawings, the numerals 2, 3 and 4 designate upper transverse steam and water drums, and 5 a lower transverse mud drum, which is connected with the drums 2, 3 and 4 by the respective banks of inclined heating tubes 6, 7 and 8.

9 designates a water-supply connection for the rear upper drum 2, 10 a series of steam pipes connecting the drums 2 and 3, 11 a similar series of pipes connecting the steam spaces of the drums 3 and 4, and 12 a series of water pipes connecting the water spaces of the drums 3 and 4.

13 designates a furnace having a grate 14. 15 is an arch over the front portion of the grate. The gases are directed among the

tubes of the front bank by the baffle 16, thence descending among the second bank of tubes 7 around the lower end of a baffle 17, and thence upwardly through the tubes of the third bank to the stack outlet 18, a horizontal baffle wall 19 being provided at the rear of the tubes 6 near their upper ends.

20 designates the superheater, which is shown as arranged between the banks of tubes 7 and 8. This superheater is shown as consisting of a series of U-shaped tubes lying side by side in vertical planes and connected at their ends to the two inclined headers 21 and 22, which are secured in the side wall of the furnace.

23 designates the steam connection from the steam space of the middle top drum 3 to the lower end of the header 21, and 24 is a steam take-off connection at the upper end of the header 22.

25 is a steam gage.

In the position shown, the superheater is adapted to give a high degree of superheat, while burning out is avoided by the extraction of heat in passing through the front bank of water tubes. By arranging the superheater tubes in a vertical plane, their tendency to sag when overheated is entirely avoided.

This form of superheater does not interfere with the standard form of boilers of this type, and can be readily applied to existing boilers without any material change in the design or arrangement.

This form of superheater may be located in any desired portion of the boiler; more than one mud drum may be used; two or more banks of water tubes may be employed with a corresponding change in the number of upper drums; and many other changes may be made without departing from my invention.

I claim:—

1. A superheater comprising a plurality of similar U-tubes each having its legs in a substantially vertical plane, corresponding legs of all of said U-tubes lying in an inclined plane, in combination with suitable inlet and outlet connections for the ends of said tubes; substantially as described.

2. In a superheater for water tube boilers

of the inclined multiple bank type, the combination of inclined inlet and outlet headers adapted to be supported by the wall of the boiler setting and a plurality of substantially similar U-tubes having their ends connected to said headers and adapted to extend  
5 between the banks of tubes of the boiler, each of said U-tubes having its legs in a substan-

tially vertical plane; substantially as described.

In testimony whereof, I have hereunto set my hand.

EDWARD H. WELLS.

Witnesses:

EUGENE P. TERRY,  
M. WINTER.