

E. H. FOSTER.
 APPARATUS FOR SUPERHEATING STEAM.
 APPLICATION FILED SEPT. 1, 1911.

1,060,334.

Patented Apr. 29, 1913.

3 SHEETS—SHEET 1.

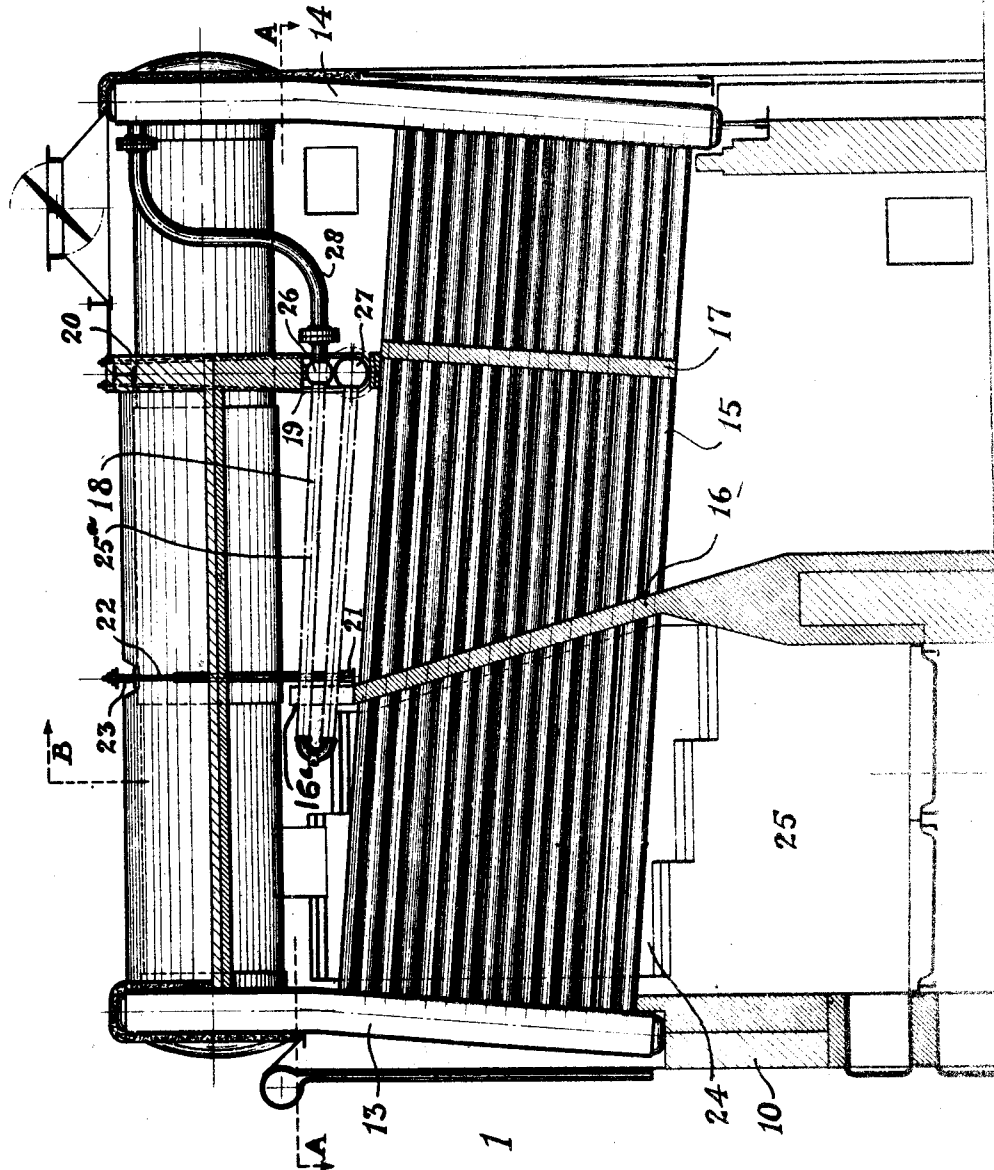


Fig 1

WITNESSES:

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 Ed. Dunham

INVENTOR

E. H. Foster

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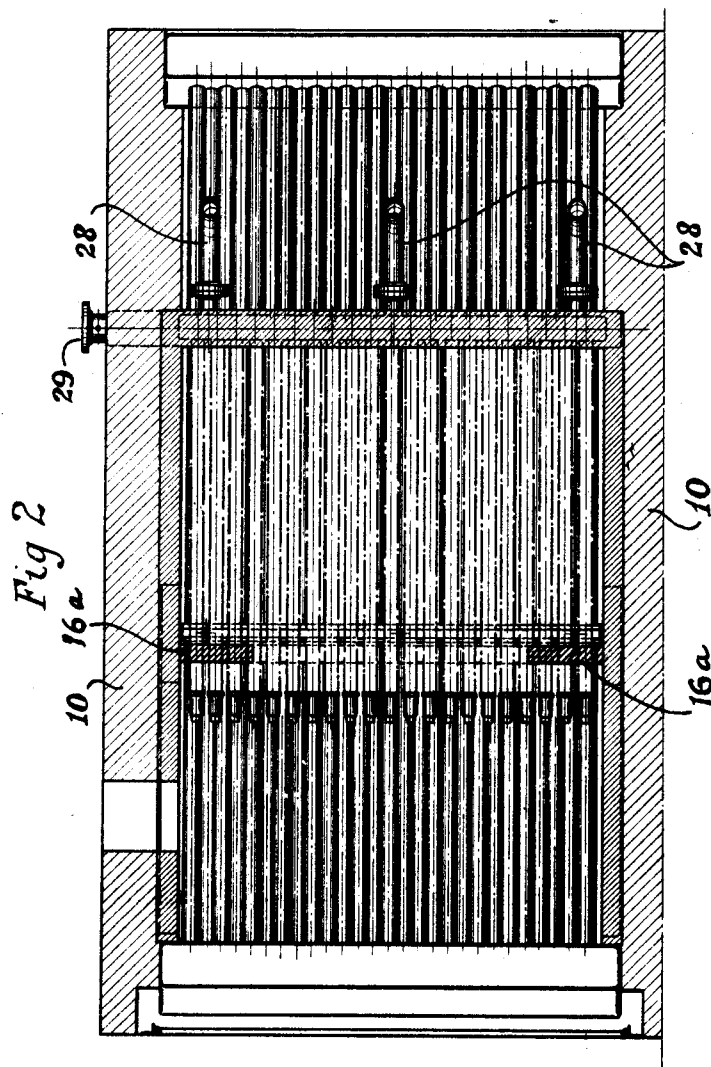
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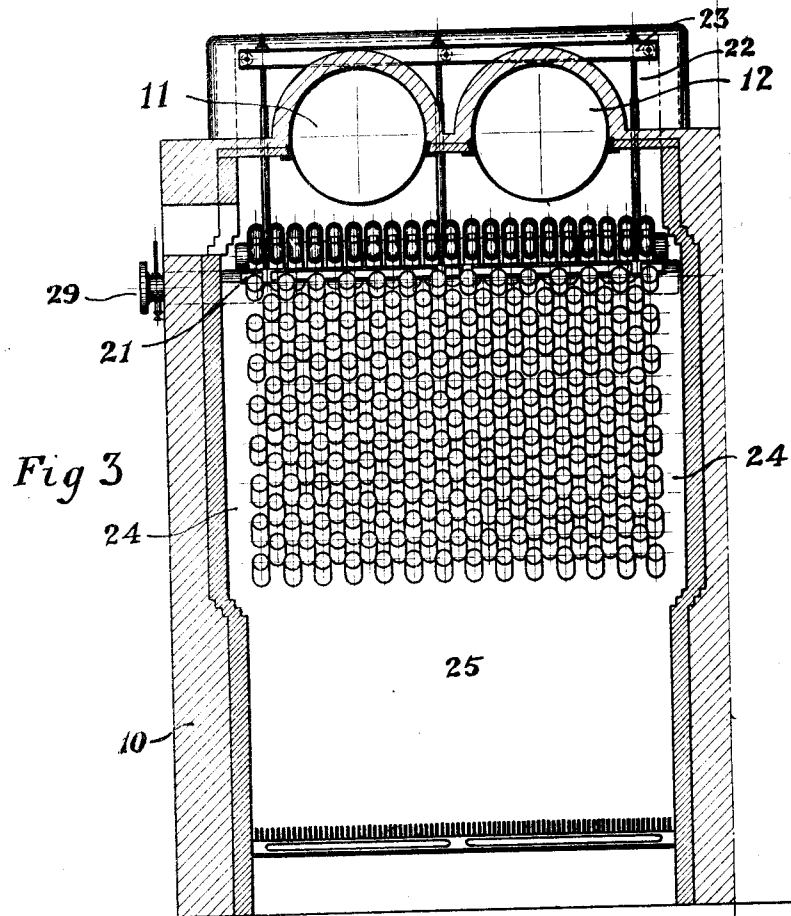
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UNITED STATES PATENT OFFICE.

ERNEST H. FOSTER, OF NEW YORK, N. Y.

APPARATUS FOR SUPERHEATING STEAM.

1,060,234.

Specification of Letters Patent.

Patented Apr. 29, 1913.

Application filed September 1, 1911. Serial No. 647,141.

To all whom it may concern:

Be it known that I, ERNEST H. FOSTER, a citizen of the United States, residing at New York, county of Richmond, and State of New York, have invented certain new and useful Improvements in Apparatus for Superheating Steam, of which the following is a full, clear, and exact description.

This invention relates to a superheater for boilers, in which the hot gases from the furnace are conveyed directly to the superheater, and consists generally in dispensing entirely with the chamber in which the superheater is ordinarily located, and providing means for deflecting the hot gases, coming directly from the furnace, among the superheater elements.

The invention consists in further improving the inlet and outlet connections of the superheater, the device being essentially an improvement upon my Letters Patent No. 983,732, dated July 5, 1910.

Referring to the drawings wherein like characters designate the same parts in all views: Figure 1 is a vertical longitudinal section of a conventional form of boiler with my improvement incorporated therein. Fig. 2 is a horizontal longitudinal section taken on line A--A of Fig. 1. Fig. 3 is a cross-sectional view taken on line B--B of Fig. 1.

The character 10 designates the boiler setting. The drums of the boiler are shown at 11 and 12, which have the depending water legs 13, 14 between which legs are the inclined water tubes 15. At convenient distances are located the vertical baffles 16 and 17. Located immediately above the water tubes and baffles is the superheater 18, supported at one end by U-shaped hangers 19 extending around the cross wall 20 and at the other end by means of a cross-piece 21 supported from hangers 22 depending from the cross-beam, 23.

In my patent referred to above I show a superheater chamber in which the superheater is located. In the present application I have so constructed the device that the said chamber can be entirely eliminated. This construction allows the superheaters to be readily cleaned and repaired, and also allows the gases to flow freely from the furnace over the respective baffles.

Flues or passages 24 are provided at the sides of the furnace 25 for conveying the heated gases upwardly and directly into and among the superheater elements. The dis-

charge into the superheater is in front of baffle 16, and the gases, passing along the longitudinal length of the U-tubes 25, are caused to flow downwardly between baffles 16 and 17 among the water tubes 15. It will thus be noted that the hot gases after passing from the superheater are utilized to heat the water tubes. The baffle 16 is provided with extensions 16^a at the upper end thereof and serve to deflect the furnace gases, coming through the passages 24, among the superheater elements. As shown, the superheater elements adjacent the side walls of the boiler setting pass rearwardly through the deflectors. It will therefore be seen that the gases coming through the passages 24 will be properly disseminated throughout the superheater and especially at that portion which is remote from the headers thereof.

The headers of the superheater are shown at 26 and 27. To the header 26 are connected the tubes 28, which convey the steam from the upper part of the drums, or from the upper part of the water leg to the superheater. The header 27 is provided in the end thereof with an outlet 29 extending through either side of the boiler setting. It is obvious that the outlets can be provided upon both sides of said setting. Such a construction not only reduces the number of joints necessary to build up the ordinary connections, but also steadies and lowers the steam pipe. Consequently a boiler of a larger capacity can be used with a low ceiling.

It will be observed from the above description that the furnace gases due to the vertical baffling and the arrangement of the superheater and associated parts, pass from the furnace through the water tubes 15, over the baffle 16, downwardly through the water tubes, under the baffle 17, and again upwardly through the water tubes to the smoke stack. Part of the furnace gases pass directly to the superheater, and after leaving the same pass downwardly between the baffles among the water tubes and from this point follow the course of the gases which pass from the furnace directly into the water tubes. Hence the hot gases which pass directly to the superheater from the furnace sweep downwardly among the boiler tubes and aid in heating the said tubes.

What I claim is:

1. The combination with a boiler setting

and furnace, and a water tube boiler having its water tubes arranged in the path of the furnace gases flowing through said setting and having one or more drums above said tubes, of a superheater above said water tubes and exposed to the open space between said tubes and the drums, and flues or conduits in the side walls of the setting extending from the furnace and discharging hot gases therefrom upon the superheater, substantially as described.

2. The combination of a boiler setting and furnace, a drum supported in said setting, a superheater located below said drum, a baffle located below said superheater, by-passes for hot furnace gases in the sides of the boiler setting, and extensions or deflectors on said baffle to disseminate the hot gases flowing through the by-passes throughout the superheater elements.

3. The combination with a boiler setting and furnace, a drum supported in said setting, inclined water tubes located between the furnace and drum, front and rear baffles for the water tubes to deflect the hot gases upwardly and downwardly among said tubes, a superheater located between the water tubes and the drum, by-passes in the

sides of the boiler setting for conveying hot gases directly to the superheater, and means at the sides of the setting for deflecting the hot gases toward the center of the boiler setting.

4. The combination of a boiler setting, one or more drums supported in said setting, water tubes substantially below said drums and arranged longitudinally thereto, a superheater having tubes between the drums and the said water tubes, said superheater tubes being substantially parallel to said drums, inlet and outlet headers for said superheater, conduits adapted to supply hot gases directly from the furnace to said superheater, baffles to deflect the aforesaid gases among the superheater tubes, means to convey steam from the drums to the aforesaid inlet header, and means to convey the steam from the outlet header through the side of the boiler setting.

In testimony whereof I affix my signature in the presence of two subscribing witnesses.

ERNEST H. FOSTER.

Witnesses:

H. M. BALDWIN,

MARGARET O'HARGAN.