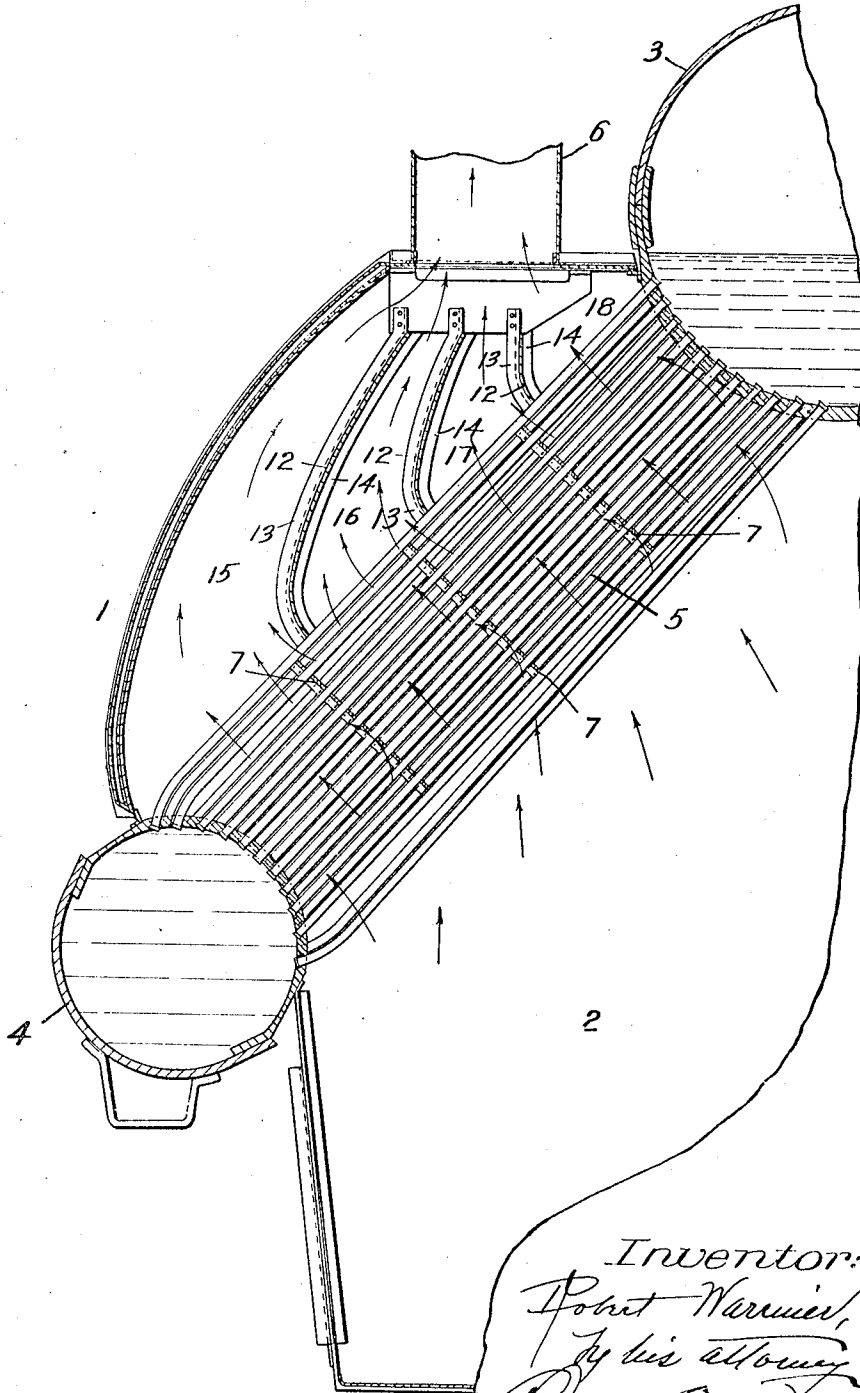


R. WARRINER.
BAFFLE PLATE.

APPLICATION FILED MAR. 25, 1918.

1,289,979.

Patented Dec. 31, 1918.



Inventor:
Rout Warriner,
By his attorney
Halter S. Gooding.

UNITED STATES PATENT OFFICE.

ROBERT WARRINER, OF QUINCY, MASSACHUSETTS, ASSIGNOR TO BETHLEHEM SHIP-BUILDING CORPORATION, OF QUINCY, MASSACHUSETTS, A CORPORATION OF DELAWARE.

BAFFLE-PLATE.

1,289,979.

Specification of Letters Patent.

Patented Dec. 31, 1918.

Application filed March 25, 1918. Serial No. 224,445.

To all whom it may concern:

Be it known that I, ROBERT WARRINER, a citizen of the United States, residing at Quincy, in the county of Norfolk and State of Massachusetts, have invented new and useful Improvements in Baffle-Plates, of which the following is a specification.

This invention relates to improvements in baffle plates for boilers and more particularly for water tube boilers of the type known as the Yarrow boiler. In this type of boiler the water tubes are disposed above and inclined with relation to the fire box and the up-take pipes of the boiler are arranged directly above the series of tubes.

Arranged transversely of the water tubes are a series of baffle plates of any desired construction which partially assist in directing the products of combustion through the series of tubes transversely thereof in order to retard and cause the products of combustion to more thoroughly contact with the exposed portions of said water tubes. These, however, are found insufficient to accomplish the desired results as they are usually placed nearly at right angles to the tubes of the series and at an angle to the fire and said fire will pass obliquely across the compartments formed by said baffle plates and leave a large portion of the surface of said tubes untouched, thereby greatly reducing the efficiency of the boiler.

The object of the present invention is to provide a second series of baffle plates which cooperate with the first series of plates in retarding and splitting up the products of combustion and directing them in such a way that practically every exposed portion of the series will be touched by the fire as it passes from the fire box to the up-take pipe.

The invention consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims.

The drawing shows a partial vertical section through a boiler of the Yarrow type, illustrating a series of baffle plates embodying my invention.

In the drawing, 1 indicates a boiler which embodies in its construction a fire box 2, a steam drum 3, arranged above and substantially central with respect to said fire box, and a water drum 4. The water drum 4, of which there are two usually employed in this type of boiler, one at each side of the

fire box, although but one is shown in the drawing, is substantially lower than the steam drum 3 and connected with the steam drum by means of a series of parallelly disposed water tubes 5, permitting the water in the boiler to have free circulation between said steam drum and said water drum.

The water tubes 5 are disposed above and inclined relatively to said fire box, owing to the relative positions of said water drum and said steam drum, consequently, the fire from the fire box will be directed upwardly through the pipes 5 constituting said series during its passage to the up-take pipe 6 of said boiler. This up-take pipe is generally positioned in close proximity to the steam drum 3, consequently there is great difficulty with this type of boiler in securing a maximum of efficiency due to the tendency of the fire to escape straight through said series of tubes to the up-take pipe. To prevent the fire from passing straight through said tubes as stated, a series of baffle plates 7 are employed and these baffle plates are distributed transversely of the tubes 5 and at predetermined distances apart throughout the length thereof so as to cause the fire from the fire box to be directed substantially at right angles through said series of tubes and to slightly retard the upward progress of said fire.

The particular construction and manner of supporting the baffle plates 7 are old and well known to those skilled in the art and further description thereof will therefore be unnecessary.

The purpose for which these plates are inserted is not wholly accomplished for the reason that said plates extend across the series of tubes 5 substantially at right angles to said tubes and incline upwardly over the fire box, and although they retard the fire passing between said fire tubes to a considerable degree, there still remains a large area of said tubes untouched by the fire.

To overcome this result and to increase the efficiency of the boiler, a second series of baffle plates 12 is provided, said second series of plates being arranged adjacent to the upper edges of the baffle plates 7 and these plates curve upwardly from said series of tubes and converge toward the up-take pipe 6, thus dividing the portion of the boiler between said water tubes and the up-

take pipe 6 into a plurality of compartments, preferably, 15, 16, 17 and 18.

The plates 12 do not form continuations of the baffle plates 7 but are preferably interposed between said baffle plates 7 so as to more uniformly distribute the fire over the entire areas of the water tubes, as indicated by the arrows in the drawing. The second series of baffle plates 12 are supported preferably by means of strips or angle bars 13 and 14 which are secured to opposite edges of the baffle plates 12 and form flanges which are, in turn, secured to the end walls of said boiler, thus firmly maintaining said baffle plates in their positions.

Having thus specifically described my invention what I claim and desire by Letters Patent to secure is:

1. A boiler having, in combination, a fire box, a series of water tubes disposed in an inclined position above said fire box, an up-take pipe arranged above said series of water tubes, a plurality of baffle plates disposed at predetermined distances apart lengthwise of the tubes constituting said series and substantially at right angles to said tubes, and a second series of baffle plates curving respectively from adjacent to the upper edges of said first named baffle plates toward said up-take pipe.

2. A boiler having, in combination, a fire box, a series of fire tubes disposed in an inclined position above said fire box, an up-take pipe above said series of tubes, a plurality of baffle plates disposed substantially at right angles to the tubes constituting said series and supported by frictional contact with said tubes, a second series of baffle plates corresponding in number with said first named baffle plates, adapted to curve

upwardly from adjacent to the upper edges of said first named baffle plates toward said up-take pipe, and means for supporting opposite ends of the baffle plates constituting said second named series.

3. A boiler having, in combination, a fire box, a series of fire tubes disposed in an inclined position above said fire box, an up-take pipe above said series of tubes, a plurality of baffle plates disposed substantially at right angles to the tubes constituting said series, a second series of baffle plates adapted to curve upwardly from adjacent to the upper edges of said first named baffle plates convergently toward said up-take pipe, and means for supporting opposite ends of the baffle plates constituting said second named series.

4. In a boiler, an up-take pipe, a fire box, a series of water tubes disposed between said up-take pipe and said fire box, a series of baffle plates disposed transversely of said series of tubes, adapted to deflect the fire from said fire box transversely through said series of tubes, and a second series of baffle plates extending from points adjacent to the ends of the baffle plates of said first named series convergently toward said up-take pipe and adapted to divide a portion of said boiler, between said series of water tubes and said up-take pipe, into a plurality of fire conducting passages.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ROBERT WARRINER.

Witnesses:

CHARLES S. GOODING,
SYDNEY E. TAFT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."