Feb. 5, 1929. 1,701,249

L. WALLSTROM

BURNER SUPPORT AND AIR PREHEATER

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Fig. 2.

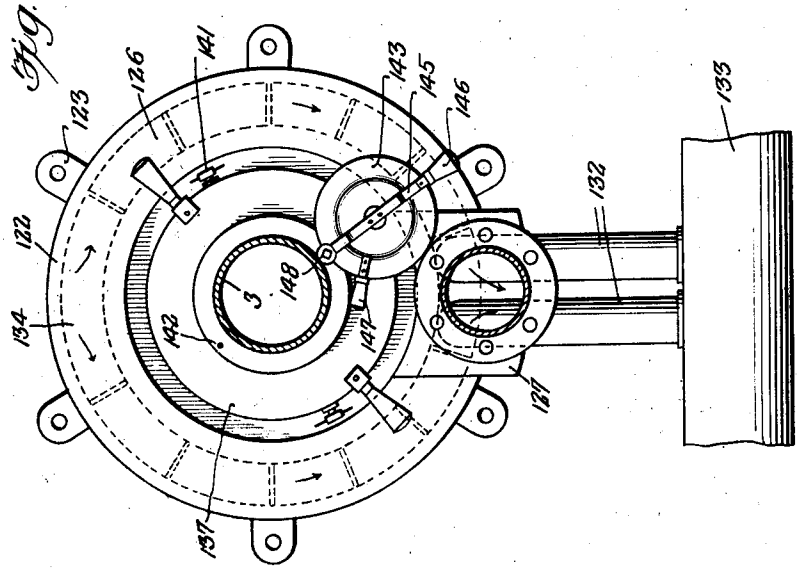


Fig. 1.

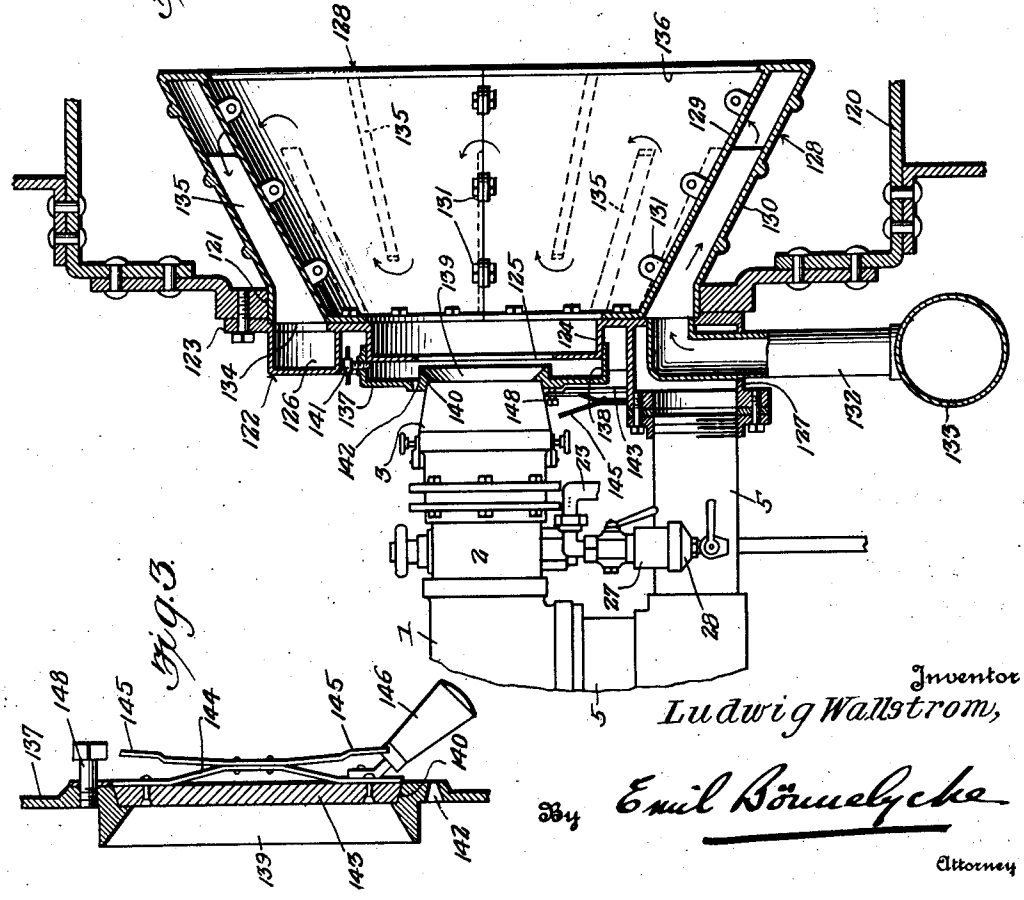


Fig. 3

Inventor
Ludwig Wallstrom,
By Emil Börnebycke
Attorney

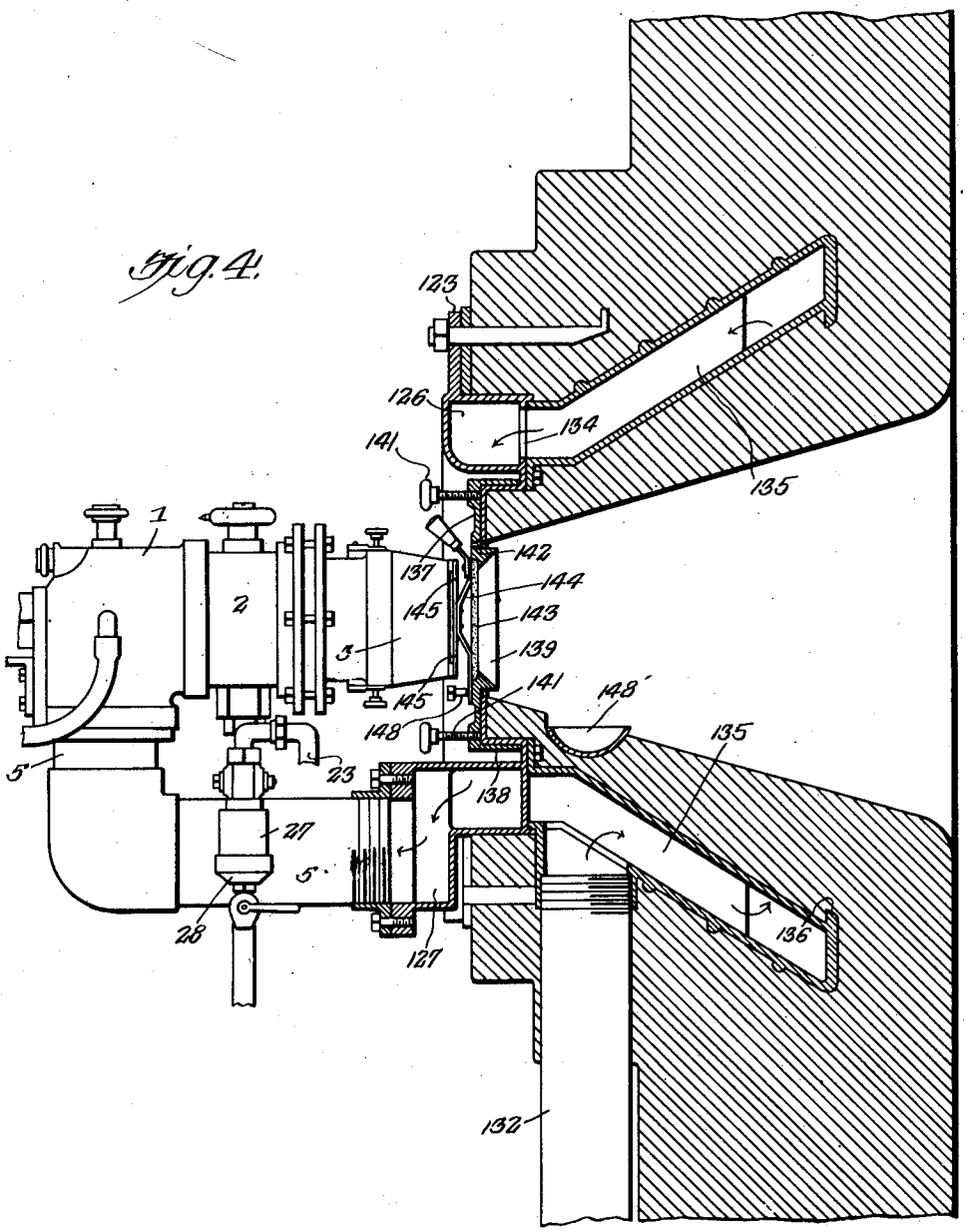
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Fig. 4.



Inventor

Ludwig Wallstrom,

By Emil Börnelycke

Attorney

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UNITED STATES PATENT OFFICE.

LUDWIG WALLSTROM, OF LIMA, PERU.

BURNER SUPPORT AND AIR PREHEATER.

Application filed December 2, 1926. Serial No. 152,180.

My present invention relates to means for associating burners with boilers and other devices to be heated thereby. I shall hereinafter describe certain improved devices for use with burners of the type disclosed in my United States Letters Patent No. 1,588,634 and No. 1,625,381.

As boilers are at present heated, a considerable amount of heat is wasted at the fire opening of the boiler, and a purpose of the present invention is to provide for advantageous utilization of this ordinarily wasted heat. Another purpose of the invention is to provide means for adapting burners of standardized or uniform dimensions for use with boilers having fire openings of different sizes, by utilizing one of a number of simple and inexpensive adapters.

The invention, whose scope is indicated in the appended claims, will now be described with reference to the preferred embodiment illustrated in the accompanying drawings, wherein:

Fig. 1 is a sectional view of the firing end of a boiler (for instance a marine or Scotch boiler) provided with an air preheater and an adapter, the figure showing at the left the fore part of a burner like that disclosed in my aforesaid patent No. 1,625,381.

Fig. 2 is a front view, partly in section, of the air preheater and adapter.

Fig. 3 is a sectional detail of the adapter with its door closed.

Fig. 4 is a view similar to Fig. 1, but showing the burner mounted on a furnace for smelting, calcining, tempering or other purposes, the door of the adapter being shown as held in the closed position by the nozzle of the burner.

Referring now to those parts of the burner shown in Figs. 1 and 4, the elbow section 1 has secured to it a sleeve 2 to which the nozzle 3 is connected. The elbow section is mounted on the stationary air pipe 5, and I prefer to make the connection in such manner that the burner may swing or swivel about the axis of the vertical turn of the air pipe, as shown in my said Patent No. 1,625,381.

In Fig. 4 and also in Fig. 1 I show oil supplying means comprising the supply hose 23, filter or strainer casing 27 and sediment trap 28. These parts are substantially identical with the correspondingly numbered parts in my said Patent No. 1,625,381, and require no further description.

In Fig. 1, a boiler 120 has a fire opening 121, over which a frame 122 is secured, by bolts or the like in ears 123 on the frame. The frame has an annular, projecting part 124 provided with a firing opening 125. The frame is also formed with an annular air passage 126 having at its bottom an enlarged chamber 127 to which the air pipe 5 is attached.

Fitting within the opening 121 and secured to the frame 122 is an air preheater 128, which consists of a double-walled cone, the air heating space being between the walls 129 and 130. This preheater may be made as a one-piece casting, but I prefer to construct it of four quadrantal parts bolted together at 131. The preheater is open at the bottom to receive air from a pipe or pipes 132 arising from a supply pipe 133, for air under pressure. The preheater is also open at the top 134, to discharge the heated air into the passage 126. Ribs 135 extending alternately from opposite ends of the preheater cause the air to take a tortuous course through the preheater and prolong its contact with the hot walls thereof. The air is initially heated as it comes up through pipes 132 which enter the enlargement 127 from which the preheated air is conveyed by the pipe 5 to the burner when the burner is used as an air and oil burner (Figs. 1 and 4).

The inner wall 129 has an inwardly directed flange 136 adapted to retain a lining (not shown) of fire clay in order to protect said inner wall from direct contact with the intense heat generated by the burner.

The air, which may be supplied by a blower at a pressure of from 30 to 35 cm. water gage, is preheated to a temperature of about 400° F.

An adapter for connecting the burner with the boiler comprises a plate part 137 and a flange 138 fitting over the annular projection 124 of the frame 122. The plate 137 has a central opening 139 with a peripheral groove 140 to receive the burner nozzle 3. Set screws 141 having tapered points are threaded through the flange 138 and when turned in they force the adapter into snug engagement with the nozzle 3. A viewing opening or peep hole 142 is provided in the plate 137.

Adapters as just described may be made cheaply and can be used for adapting a burner having a nozzle of given size to boilers and air preheaters of varying sizes, and vice versa.

When firing is to be stopped, it is desirable to close the opening 139. To this end,

I provide a door 143 of asbestos or other heat insulating material, adapted to fit in the groove 140 of the opening 139. The door is carried by a metal backing or frame 144 to which I secure spring blades 145. A handle 146 is secured to the frame 144 and a second handle 147 may if desired be secured to the door, the handles having wooden or other heat insulating grips. When the door is to be closed, the set screws 141 are retracted so that the adapter may be moved to the right (Fig. 1). The door 143 is then inserted between the nozzle 3 and the plate 137, and fits in the groove 140 (Fig. 3). The spring blades 145 engage the nozzle 3 (as shown in Fig. 4) and maintain the door pressed firmly in place. It is not necessary when the door is not in use, to have it connected with the adapter, but I prefer to pivot it thereon by means of a bolt 148.

In Fig. 4, the preheater is shown embedded in the fire clay composing the front wall of a furnace. The set screws 141 of the adapter are provided in the plate 137 instead of in the flange 138, and a trough 148′ is disposed in the fire clay lining of the preheater. When the furnace has cooled and it is desired to restart firing, said trough is filled with oil which is ignited to heat gradually the fire clay surrounding the air preheater.

I claim as my invention:

1. The combination with a fire-box and a burner having a nozzle, of a burner support and air-preheater, and adapting means for operatively connecting the nozzle and the fire-box, said air-preheater comprising a portion having an air passageway disposed within the fire-box, a portion having an annular air passageway disposed outside the fire-box and also having an air discharge opening, and a pipe rigidly connected with the annular air passageway and communicating therewith at said discharge opening, said pipe being adapted to support the burner in operative position with respect to the fire-box.

2. The combination according to claim 1, in which the air-preheater includes a conical, double-walled chamber and means between the walls to cause the air to take a tortuous course therethrough.

3. The combination according to claim 1, in which a layer of heat-resistant material is provided for that portion of the fire-box subjected to high temperatures.

4. The combination according to claim 1, having a layer of heat-resistant material for that portion of the fire-box subjected to high temperatures, and a receptacle supported in said material to hold fuel adapted to be burned to heat said material before starting the burner.

5. The combination according to claim 1, in which the adapter has a door for closing the opening normally receiving the nozzle, said door having resilient means adapted to engage the nozzle and press the door against the adapter.

In testimony whereof I affix my signature.

LUDWIG WALLSTROM.