June 27, 1939. J. WAGNER 2,164,262

AIR DISTRIBUTOR

Filed June 11, 1936 2 Sheets-Sheet 1

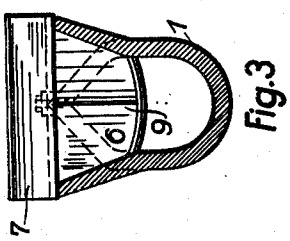


Fig.3

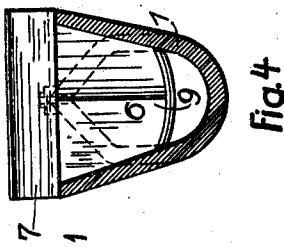


Fig.4



Fig.7

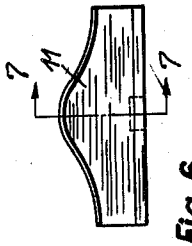


Fig.6

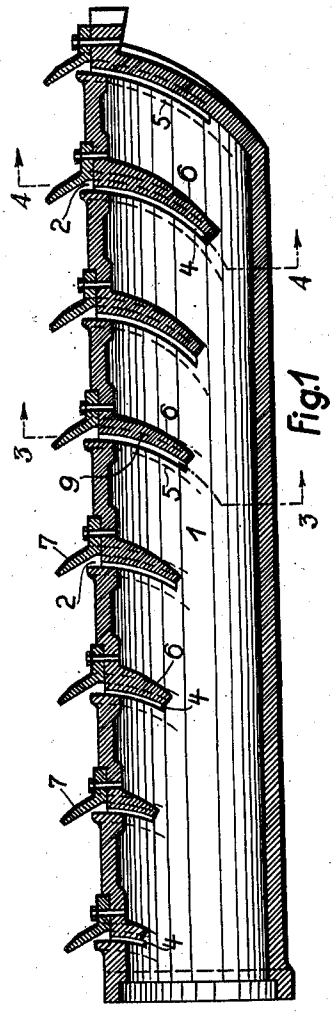


Fig.1

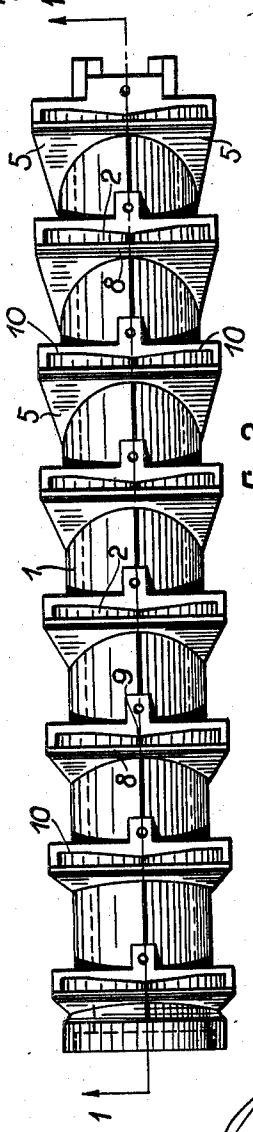


Fig.2

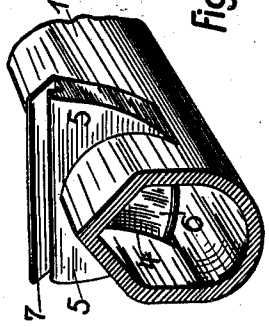


Fig.5

Inventor:
Johann Wagner.
By Hauck & Applemann
Attys.

June 27, 1939. J. WAGNER 2,164,262

AIR DISTRIBUTOR

Filed June 11, 1936 2 Sheets-Sheet 2

Fig. 8

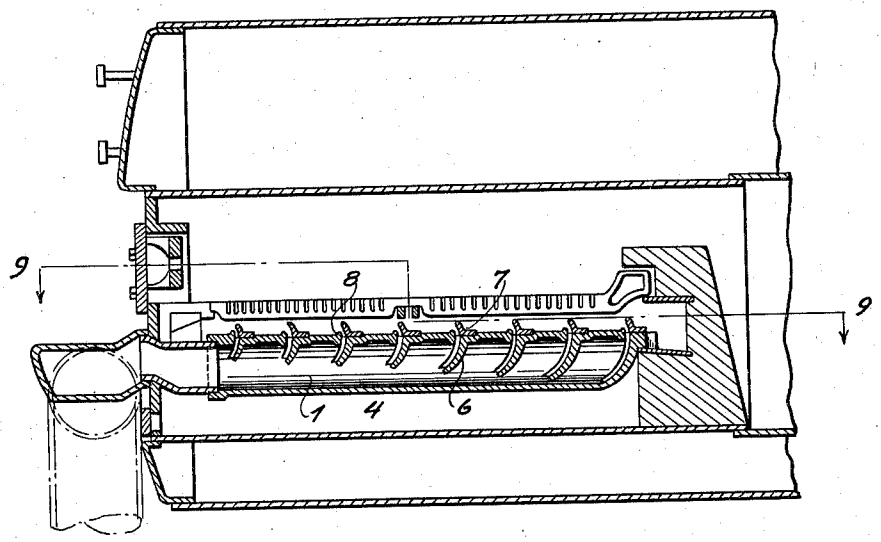
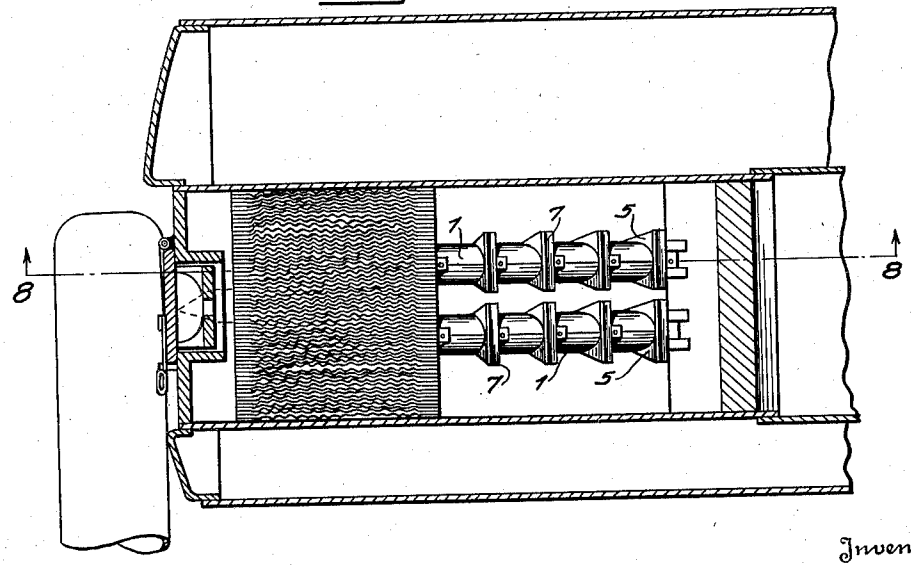


Fig. 9



Inventor,

Johann Wagner,

By Frank A. Ackerman,

Attorney.

Patented June 27, 1939

2,164,262

UNITED STATES PATENT OFFICE

2,164,262

AIR DISTRIBUTOR

Johann Wagner, Breslau, Germany

Application June 11, 1936, Serial No. 84,759
In Germany June 13, 1935

6 Claims. (Cl. 110—71)

This invention relates to an air distributor for forced draft furnaces, wherein air distributing pipes having air outlet openings on their upper sides extend below the grate into the ash pit. Directly behind the air outlet openings deflecting or distributing screens inclined towards the air current are arranged inside and outside the pipes.

The known air distributors of this type are open to the objection that, owing to insufficient distribution in lateral directions, the air does not become fully effective at all points below the grate, particularly at the points positioned at the sides. The result is an uneven or imperfect utilization of fuel, especially if poorly burning material like dust-coal is concerned.

The invention aims at eliminating this drawback and insuring perfect and uniform combustion of the fuel over the total grate area to attain maximum efficiency by extending the transverse slots for the air outlet beyond the width of the pipe which for this purpose is fitted with lateral boxlike projections for surrounding the portions of the slots projecting beyond the section of the pipe. Perfect uniformity of air discharge at each longitudinal section of the transverse slots is effected by rendering the width of the slots narrowest vertically above the center of the pipe and continually increasing it towards both sides. Furthermore, the distributor hoods may project beyond the transverse slot vertically above the pipe to a farther extent than on the sides. In this way the air, even at only slight superatmospheric pressure thereof, can be uniformly distributed under the entire grate.

The invention is equally applicable to all firing systems besides flame tube boilers.

By way of example, the invention is illustrated in the accompanying drawings, in which Figure 1 is a longitudinal section of the air distributing pipe taken on the line 1—1 of Fig. 2; Fig. 2, a plan thereof without the distributing hoods; Fig. 3, a cross section of the pipe on the line 3—3, of Fig. 1; Fig. 4, a cross section on the line 4—4, of Fig. 1; Fig. 5, a section of the distributing pipe and a partial diagrammatic view thereof; Fig. 6, a front view of a distributor hood; Fig. 7 is a section on the line 7—7 of Fig. 6; Fig. 8 is a longitudinal vertical section on the line 8—8 of Fig. 9; and Fig. 9 is a transverse vertical section on the line 9—9 of Fig. 8.

Referring to the drawings, the air distributing pipe 1 positioned below the grate area is provided in the construction shown with 8 transverse slots on the upper side, whence the fresh air supplied emerges at a certain pressure. To insure good lateral distribution of air the cross slots 2 are wider than the pipe diameter 1. To form transverse slots 2 of this width the walls of the pipe 1 are perforated by lateral slots 4 and provided with boxlike projections 5 on both sides of the pipe 1. The walls of the boxes are rounded like the inner screens 6 which from the rearward edge of each slot 2 extend more or less deeply into the cross section of the pipe. In this manner the screens 6 are continued in the rearward box walls 5 without interruption, and the outcoming air current is thus uniformly guided over the entire width of the slot, which guiding is continued by the attached hoods 7.

To cause an equal distribution of air to emerge throughout the entire length of the slots, the latter are contracted centrally at the top of the pipe. In the example shown the front edge 8 of the slot is straight, whereas the rearward edge 10 is formed with a central projection 9 which approaches the front edge more or less and broadens laterally like a wink towards both sides. This shape is preferably chosen for the entire screening surface 6 over which the projecting middle point 9 extends therefore in vertical direction. Thus, a gradual narrowing of the slots toward the center is achieved.

The distributor hood 7 has substantially a straight upper edge, as indicated in Figs. 3 to 5. Figs. 6 and 7 show another form of distributor hood which in the center possesses an undulatory elevation 11 to impart the requisite direction to the outcoming air current. There are of course other changes in the top edge of the distributor hood possible, including the inclination, curving or rounding thereof, according to requirements.

Figs. 8 and 9 illustrate the use of the invention as applied to a one flame tube boiler. However, it is readily apparent that the new distribution pipes may be used equally advantageously with other firing systems. Therefore, the showing of Figs. 8 and 9 is intended to be illustrative rather than limitative.

The air distributing pipe may have thick walls suited for heat insulation, to protect the air within the pipe from being prematurely exposed to the action of heat. Instead of thick walls the pipe may be fitted with layers of heat insulating material.

I claim:

1. An air distributor for furnaces or the like having a forced air feed beneath the grate thereof, comprising an air supply conduit positioned beneath the grate of the furnace, an air inlet at one end of said conduit, the upper portion of said

conduit being formed to provide a plurality of spaced transverse slots therein, each of said slots being longer than the slot next nearest the inlet end of said conduit, open box-like projections formed on the top of said conduit around each of said slots, and said projections being flared outwardly beyond the planes of the sides of said conduit whereby to provide diverging continuations of said slots.

2. The structure of claim 1, and said slots and projections being formed to be relatively narrow at the centers thereof with their widths gradually increasing toward the sides.

3. The structure of claim 1, and plate-like distributor hoods detachably secured to the top of said conduits and overlying the entire length of said slots and projections in an upwardly slanting direction.

4. The structure of claim 1, said slots and projections being narrowest at the centers and gradually increasing in width towards the sides, and plate-like distributor hoods detachably secured to the top of said conduit and overlying the entire length of said slots and projections in an upwardly slanting direction.

5. The structure of claim 1, a plate-like distributor hood detachably secured to the top of said conduit adjacent each projection and overlying the entire length thereof in an upwardly slanting direction, and the central free edge portion of said hood having an extension formed thereon.

6. The structure of claim 1, said slots and projections being narrowest at their centers and gradually increasing in width towards the sides, a plate-like distributor hood detachably secured to the top of said conduit adjacent each projection and overlying the entire length thereof in an upwardly slanting direction, and the central free edge portion of each hood having an extension formed thereon.

JOHANN WAGNER.