PUBLISHED	**J. N. VAN RIJSWIJK**	**Serial No.**
MAY 11, 1943.	FURNACES AND STOKING INSTALLATIONS THEREFOR	**248,047**
BY A. P. C.	Filed Dec. 28, 1938	

Fig. 1

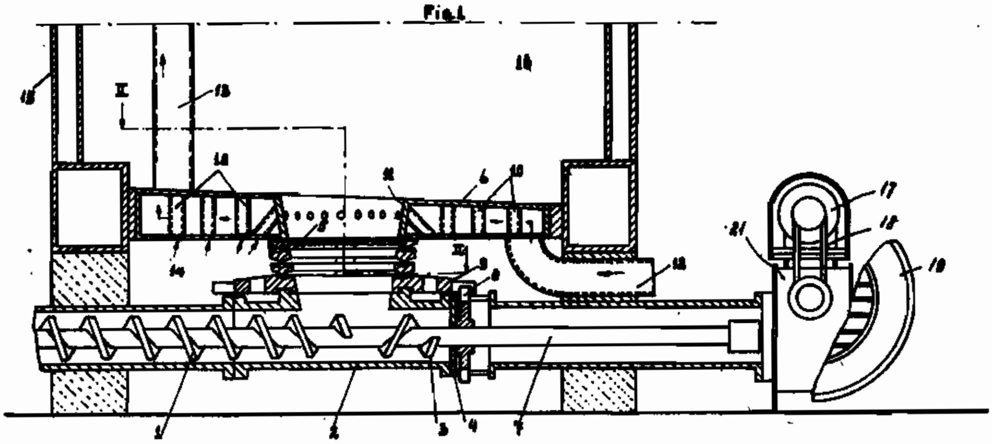
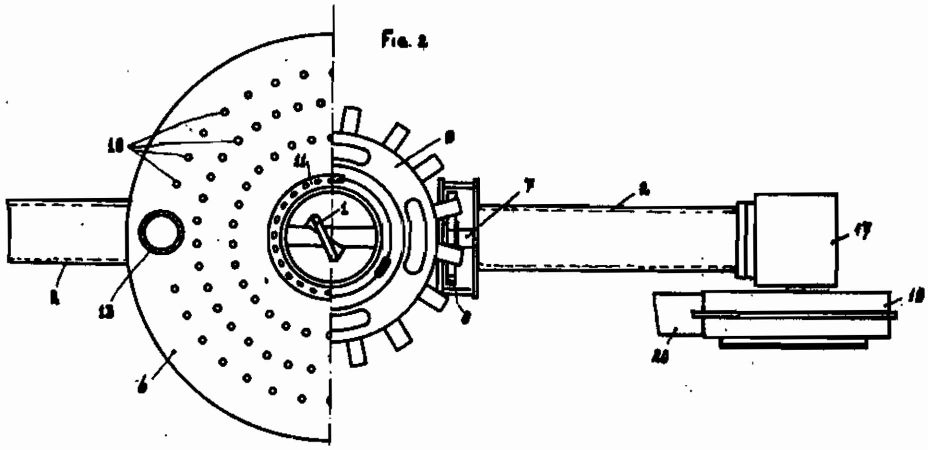


Fig. 2



Jacobus Nicolaas van Rijswijk INVENTOR.
per N. D. Fitzpatrick
ATTORNEY.

Published May 11, 1943 Serial No. 248,047

ALIEN PROPERTY CUSTODIAN

FURNACES AND STOKING INSTALLATIONS THEREFOR

Jacobus Nicolaas van Rijswijk, The Hague, Holland; vested in the Alien Property Custodian

Application filed December 28, 1938

The invention relates to stoking installations, and to furnaces having stoking installations, of the so-called "underfeed" type, i. e. the type wherein there is a fire-bed and the fuel is fed into a fire-pot below the fire-bed; said fire-pot communicating with a fuel opening in the fire-bed.

This type of stoker has the particular disadvantage that the fuel fed into the fire-pot is pressed to one side of the pot, owing to the pressure exerted on the fuel by the fuel-conveyer, and there is the result that at the one side of the fire-bed there is a piling up of fine coals, while only coarse coals are delivered to the other side of the fire-bed.

It is clear that this will cause non-uniform combustion owing to the unequal resistance which air encounters on burning fine and coarse coals.

The chief object of this invention is to obviate the disadvantage referred to, and with this object in view the invention consists in providing a rotating fire-pot open at its upper end and having its upper end in registry with the fuel opening in the fire-bed, the fire-bed being stationary and provided with air-access apertures.

In stoking installation in accordance with the invention the combustion takes place only partly in the rotating fire-pot, so that one derives the advantage not only of being independent of the swelling properties of the fuel, but also of not being bound to a maximum-capacity.

According to the invention moreover the fire-pot is rotatably positioned between the fire-bed and the casing of the conveyer (normally a screw conveyer) for feeding the fuel to the fire-pot.

The especial advantage of this feature is that a zone of friction exists between the mass of fuel rotating with the pot and the stationary edge of the fire-bed fuel-opening, said edge being preferably divergent towards the upper surface of the fire-bed. As a result combustion is influenced favourably, because:

(*a*) The tendency of the clinker to form an obstruction above the place where the highest temperature prevails (i. e. just above the rotating fire-pot) is resisted by the friction of the rotating mass. The clinker is thus held loose and further removed from the stationary fire-bed.

(*b*) The friction prevents swelling of the parts of coal and coke, while the fuel layer on the fire-bed remains more exposed to the forcing air and more suitable for good and regular combustion.

In order to prevent the driving-mechanism for the rotating fire-pot from expanding due to the heat of the fire and also from sticking due to ashes and other ingredients, according to a further feature of the invention one of the rib-rings, of which the fire-pot consists, is constituted by a member like the rim of a gear wheel, so that the gear teeth lie in the air-chamber of the furnace, and, for rotation of the fire-pot, the gear teeth are in direct engagement with a toothed wheel that is mounted on the motor-driven shaft of the screw-conveyer and lies also in the air-chamber.

The accompanying drawing illustrates one example of the invention, and in the drawings:

Fig. 1 is a vertical section of part of a furnace having a stoking installation in accordance with the invention.

Fig. 2 is a sectional plan view taken on the line II—II of Fig. 1, the furnace having been omitted in the interests of clearness.

Referring to the drawing:

The furnace is divided into a combustion chamber 16 and an air chamber 14 by the fire-bed 6. A conveyer for the fuel, constituted by a screw conveyer comprising a screw element 1 in a tubular casing 2, projects into the air chamber and the tube 2 has an outlet opening towards the end within the chamber. The threading of the screw element includes a part 3 between the outlet opening on the tube and the end of the tube within the furnace which part has a pitch opposite to that of the threading at the fore-end. The purpose of the threading 3 is to prevent the coals being fed from pressing on the cover 4 closing the end of the tube, and the threading 3 moreover prevents the coal dust from penetrating to the bearing of the screw-element, the fuel being driven back.

The outlet opening on the tube 2 is in registry with the lower end of the fire-pot 5, the fire-pot being as shown open at both its upper and lower ends and being rotatably seated on a bearing around the outlet opening of the tube. The upper end of the fire-pot is in registry with the fuel opening 11 in the fire-bed, the fire-pot being thus positioned between the tube 2 and the fire-bed.

The fire-pot 5 is slowly driven by a toothed wheel 8 on the shaft 7 of the conveyer-element 1, the shaft 7 being in driving connection with a motor 17 through the intermediary of a transmission gear which is housed in the casing 21. The toothed wheel engages a ring of gear teeth 9 on the fire-pot 5. The fire-pot 5 consists of superimposed, spaced blocks or rib-rings, so that air-apertures are formed and the teeth 9 are formed on the lowermost of the rib-rings.

The fire-bed 6 does not participate in the rota-

tion of the fire-pot. It is hollow and water-cooled and consists in the illustrated example of a welded box of sheet-iron and is provided with tuyeres 10, which are welded to the under- and upperside of the bed respectively and are arranged in a number of concentric rows. The tuyeres 10 in the innermost row are, as Fig. 2 shows, inclined and terminate in the central opening 11 of the bed 6.

The inlet-tube for the fire-bed cooling water is denoted by 12, while the outlet occurs at the opposite side by means of the tube 13. Both the inlet-tube and the outlet-tube communicate with the heating-boiler.

The air-chamber 14 from which air passes, not only through the tuyeres 10 into the combustion chamber, but also through the air-delivering apertures into the fire-pot, is supplied with air through a pipe 20 by a fan 19. The fan is driven by the motor 17 through the intermediary of belt and pulley mechanism 18. The ring of gear teeth 9, and also the toothed wheel 8 engaging with it, lie in the air-chamber.

The furnace is constructed double-walled as shown and the fire-bed 6 is fixed at its sides against the inner sides of the furnace by means of suitable material.

JACOBUS NICOLAAS VAN RIJSWIJK.