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CHAIN OR TRAVELING GRATE STOKER

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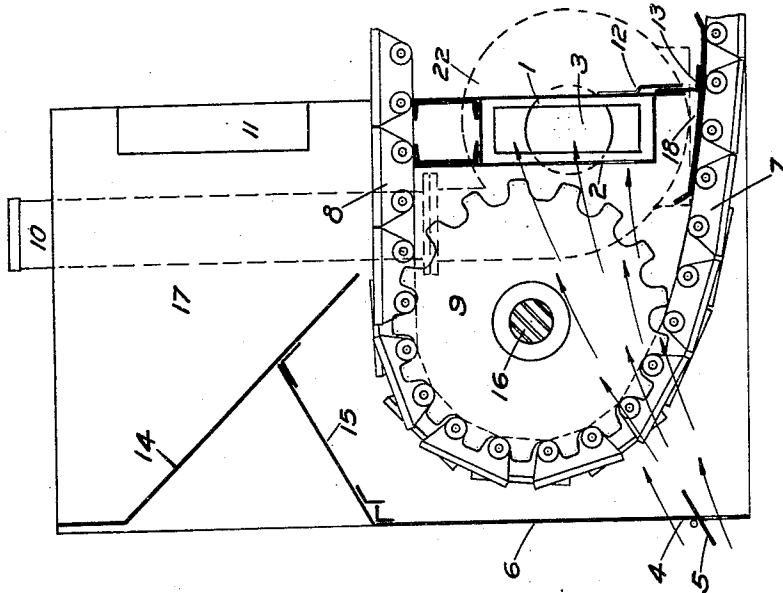


Fig. 1

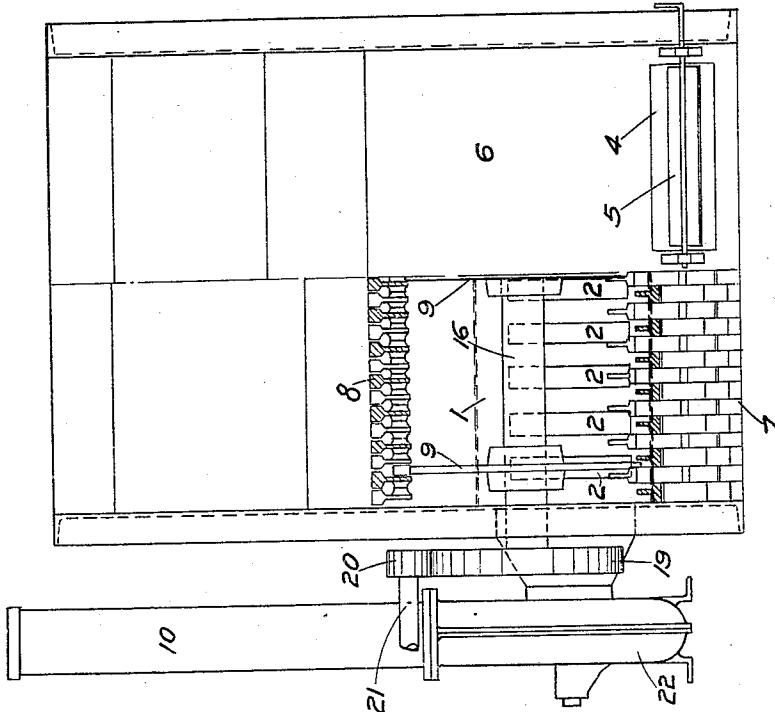


Fig. 2

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CHAIN OR TRAVELING GRATE STOKER

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One of the objects of this invention is to provide means whereby the stoker chain or grate is cooled after passing through and before re-entering the furnace. Heretofore trouble has been experienced on natural draft stokers in burning low ash coals. One of the principal causes of this trouble is the overheating of the grate links. The proximity of the fire to the links with the aforesaid coal causes the links to heat and without forced cooling the heat in the metal grate bar constantly increases by repeatedly traveling through the extremely high heat of the furnace. The consequence is that the temperature may and sometimes does cause the link to melt. When this occurs it is necessary to stop the stoker until the part can be repaired, which, therefore, causes great loss of time as well as the trouble and expense of making the repair.

The same difficulty has been experienced with forced draft chain or traveling grate stokers when air highly preheated is used in conjunction with them. In this type of stoker even less radiation of heat is possible due to the fact that the chain is subjected to high heat not only in passing through the furnace but also in traveling from the rear of the furnace to the front. Furthermore, the front end of a forced draft stoker is, as a rule, enclosed, thereby precluding the possibility of any cooling effect by contact with air of atmospheric temperature.

The other phase of my invention relates to the elimination of obnoxious gases and dust from the boiler and furnace room.

In some industrial plants gases having a higher or lower calorific value are produced as a by-product. It has become common practice to convey these gases to the boiler room to use them as at least a part of the medium for burning the fuel on forced draft grates. However, any escape into the boiler room of these gases, such as hydrogen sulphide, sulphur dioxide, or carbon monoxide, makes operating conditions a menace to health.

Dust also escaping from the front of a stoker makes operating conditions unsatisfactory. My invention overcomes the menace to health by these obnoxious gases and dust

and overcomes the excessive maintenance cost due to the burning of the grate links.

The accompanying drawings show more clearly the features embodied in the preferred construction of my invention, which is, however, shown merely by way of illustration of the principle involved.

Fig. 1 is a front elevation partly in section showing my invention applied to a forced draft chain grate, and

Fig. 2 shows a transverse, elevational, sectional view thereof.

Referring in detail to the drawings, I provide between the upper and lower strands of the grate a suction chamber 1, provided with slots 2, which is connected to a stack 10 or to a mechanical air exhauster provided with a fan 22 or other air exhausting means and also provided with an opening 3 in the end thereof. The location of this opening 3 is clearly shown in Fig. 2 with reference to the top strand 8 and the bottom strand 7 of the grate. These strands are driven by the driving sprocket 9 mounted on the shaft 16, which shaft carries a gear 19 driven by a pinion 20 on a driving shaft 21 which is connected to any suitable source of power. The dust cover 6 is provided with openings 4 fitted with dampers 5. These dampers are used to equalize the air flow across the width of the grate.

Above the upper strand 8 is a feed gate 11 which is movable in a vertical plane. This feed gate 11 regulates the thickness of the fuel bed entering the furnace from the coal hopper 17. The coal hopper 17 is provided with a sloping hopper plate 14, which guides the coal onto the upper strand 8. The hopper plate 14 is supported in part by an angle plate secured to the sidewalls.

Below the suction chamber 1 is a guide 12 in which the vertical leg 13 of the air seal plate 18 moves up and down, when any heavy material accumulating on the lower strand 7 passes under it.

In operation, draft is induced by the mechanical air exhauster thereby causing air to flow as indicated by the arrows in Fig. 2, through the openings in the dust cover into the suction chamber. The air in its course passes around the links and between them,

thereby absorbing the heat from the links and sweeping the gases into the air exhauster, thereby preventing the outward passage of gases or dust. The hot air or gases can be caused to re-enter the furnace from the air exhauster 10 or, if desired, they can be discharged into the atmosphere or to the main chimney.

The primary object of this invention, therefore, is to obtain the aforesaid results and it is obvious that many changes may be made in the specific form of mechanism whereby the desired results are accomplished without departing from the spirit of this invention. I, therefore, reserve to myself the right to make all changes which may fairly fall within the scope of the appended claims.

I claim:—

1. In a traveling chain grate stoker, upper and lower strands of grates and a suction chamber between the strands provided with an opening for the admission of air.

2. In a traveling chain grate stoker, upper and lower strands, a suction chamber communicating with the space between the strands, the grate being provided with openings for the passage of air, and means for producing a current of air from the atmosphere through the grate.

3. In a traveling chain grate stoker, a plurality of strands of a grate, a suction chamber communicating with said grate, a cover over the front end of the stoker, said cover being provided with openings, means whereby a current of air is caused to pass through said openings and through and around said grate into the suction chamber, and means to expel the heated gases from the suction chamber.

4. In a traveling chain grate stoker, upper and lower strands, a suction chamber between said strands, an air exhauster, and means whereby a current of air is caused to pass through and around said grate, through said suction chamber and into said air exhauster.

5. In a traveling chain grate stoker, a plurality of strands of a grate having a suction chamber in communication therewith, an air exhauster, a cover over the front of said grate, said cover being provided with an opening, a damper in said opening, and means whereby a current of air is caused to pass through said opening, through and around said grate into said suction chamber and out of said air exhauster.

In testimony whereof I affix my signature.
WILLIAM M. DUNCAN.