SPREADER STOKER APPARATUS

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This invention relates to stokers, more par-
ticularly to those of the "spreader" or "sprinkler"
type, and has for an object to provide improved
cooling means therefor.

In stokers of this character, it is common prac-
tice to project fuel rearwardly through an open-
ing in the furnace front wall to the grate surface
within the furnace, the opening in the furnace front
wall generally being disposed a material dis-
tance above the level of the grate surface.

In such constructions, it has been found de-
sirable to provide means for cooling the lower lip
or edge of the furnace front wall opening, to pro-
tect the same from the intense heat encountered
at this point in apparatus of this character, par-
ticularly where much of the fuel is burned in sus-
pension and thus in close proximity to said lip.

Therefore, it is a further object of the inven-
tion to provide means for conducting a cooling
medium to the vicinity of the lower edge of the
fuel feed opening in a furnace front wall.

Yet another object of the invention is to pro-
vide an adjustable air discharge nozzle arrange-
ment adjacent the lower edge of the fuel feed
opening of a furnace wall.

Another object of the invention is to provide,
in a furnace to which fuel is fed through an open-
ing in a wall thereof by a feed device of the
"sprinkler" or "spreader" type, means providing a
transversely-extending series of air discharge
nozzles for discharging a sheet or curtain of air
rearwardly into the furnace combustion chamber,
together with means whereby the angle of dis-
charge of the air from the nozzles may be varied
from externally of the furnace and during normal
operation thereof.

These and other objects are effected by the
invention as will be apparent from the following
description and claims taken in connection with
the accompanying drawings, forming a part of this
application, in which:

Fig. 1 is a vertical sectional view through the
front wall of a furnace incorporating the prin-
ciples of the present invention;

Fig. 2 is a fragmentary elevational view of the
furnace front wall viewed from interiorly of the
furnace along the line II—II of Fig. 1, looking in
the direction indicated by the arrows, the heat-
resisting coating shown in Fig. 1 being omitted
for the sake of clearness; and,

Fig. 3 is a fragmentary sectional view taken
along the line III—III of Fig. 1, looking in the
direction indicated by the arrows.

Referring now to the drawings more in detail,
the reference character 16 indicates, in its en-
tirety, the fuel-feeding device of the "sprinkler"
or "spreader" type, adapted to protect fuel rear-
wardly through an opening 11 in the front wall
12 of the furnace 13, for combustion on the
grates 14 and in the atmosphere thereabout.

More particularly, the fuel-feeding mechanism
comprises a rotor 16 carried by a transversely-
extending shaft 17 and having mounted thereon
a plurality of radially-extending fuel-impelling
blades 18 and 19, adapted to engage fuel dis-
charged from the rear edge of the spill plate 20
by the transversely reciprocable feed plate 21.
Fuel may be fed to the rear discharge edge of the
spill plate 20 by any suitable means (not shown).

The rotor 16 is housed by a partially cylindrical
casing comprising the arcuate sections 23 and 24,
both carried by the bracket 25, which is bolted
or otherwise secured to a vertical plate structure
comprising the lower plate 26 and the upper plate
27, both secured to the outer face of the furnace
front wall 12. The upper plate 21 is provided with
an opening 28 therein adapted to substantially
overlie, and to be aligned with, the opening 11 in
the furnace front wall 12.

A casing 32, of cast or fabricated construction,
is secured to the rear side of the vertical plate
27 and forms therewith a chamber 31, to which
air under pressure is supplied by the conduit
30 (Fig. 2), flow of air through this conduit being
controlled from externally of the furnace by the
damper 33.

Referring now to Figs. 2 and 3, it will be ob-
served that, for ease in manufacture and assem-
bly, the casing 30 is made in a plurality of sec-
tions indicated 30a, 30b and 30c provided with
rearwardly-extending vertical flanges 34 at the
side edges, adjacent flanges being secured to-
gether by suitable means, such as the bolts 35.

Above the casing 30 and adjacent the lower
dge of the fuel-feed opening 20 in the vertical
plate 27, there is positioned a nozzle clamping
structure comprising spaced members 36 and 37
having opposed arcuate surfaces between which is
retained a nozzle manifold 38 of cylindrical cross
section and preferably extending for the full
width of the fuel-feed opening. The cylindrical
manifold 38 is provided with a plurality of nozzle
openings 39 preferably in the form of elongated
slots (Fig. 2) adapted to discharge a sheet or
blanket of air supplied to the interior of the
manifold through the inlet opening 40 at the
lower portion thereof. The chamber 31 is pro-
vided at its top with a discharge opening 41,
whereby air supplied to the chamber by the duct,
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33 may pass upwardly through the opening 41 to the interior of the nozzle manifold 38, for discharge therethrough from the nozzles 39. Inasmuch as the air is supplied by conduit 32 to the chamber 31 throughout the entire height of the latter, it will be apparent that the entire plate structure and its associated parts will be cooled and protected by the air passing through the chamber 31 to the nozzle manifold.

Inasmuch as it may be desirable to vary the angle of discharge of air from the nozzles 39 in accordance with changes in the character of the fuel being fed, the manifold 38 is provided at one end with an extension 43, projecting through a side wall of the furnace and carrying suitable means by which it may be rotated about its horizontal axis, for example, the meshed gears 44 and 45 and the crank 46.

The rear vertical surface of the casing 30 is provided with a layer or coating of heat-resistant material 50, for example, cement, to protect the casing from the intense heat of the fire within the combustion chamber. In order to securely retain the coating 50 in place on the vertical surface of the casing 30, the latter is provided with a plurality of ribs 51 projecting rearwardly therefrom and preferably increasing in cross-sectional area in a rearward direction in order to provide, in effect, a dovetailed connection with the heat-resisting coating 50.

While the rearward wall of the casing 30 may be inclined rather than vertical, the latter construction has been illustrated in the drawings and there is associated therewith a block or plate 53 of heat-resisting material, providing a ledge 54 between the casing 30 and the forwardmost grate bar 14. To prevent accumulations of fine fuel upon this ledge 54, the air chamber 31 within the casing 30 is provided with a transversely-extending series of nozzle openings 55 adapted to direct rearwardly a stream of air to sweep the ledge 54 and to project any fuel settling thereon rearwardly onto the fire bed onto the grates 14.

Preferably, although not necessarily, the vertical plate 27 and the casing 30 are provided with a plurality of observation openings 60 extending therethrough and closed by covers or doors 61 at the exterior front of the furnace. As indicated in Fig. 1, these openings 60 extend through the air chambers 31, but do not materially obstruct vertical passage of air therethrough from the bottom to the top of the chamber.

While the invention has been shown in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof.

What is claimed is:
1. In a stoker, upright plate structure adapted to be attached to a furnace wall and having an opening therein through which fuel may be impelled into the furnace, casing structure operatively associated with the rear side of said plate structure and providing a chamber below the opening, means for admitting air under pressure to said chamber, and means near the top of the chamber for discharging air rearwardly from the chamber into the furnace, said means being adjustable from externally of the furnace to vary the angle of discharge of said air relative to the horizontal.

2. In a stoker: upright plate structure adapted for attachment to a furnace wall and having an opening therethrough for passage of fuel to the furnace; casing structure operatively associated with the rear side of the plate structure and providing a chamber extending downwardly from adjacent the lower edge of the opening; means for admitting air under pressure to said chamber; a horizontally-disposed nozzle manifold positioned just below and rearwardly of the lower edge of the opening, said manifold having a plurality of nozzle openings and being adapted to receive air from the chamber and to discharge the same rearwardly into the furnace through said nozzle openings; and mechanism operable from externally of the furnace for oscillating said nozzle manifold about its horizontal longitudinal axis, whereby the angle of discharge of air from the nozzle openings may be varied.

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