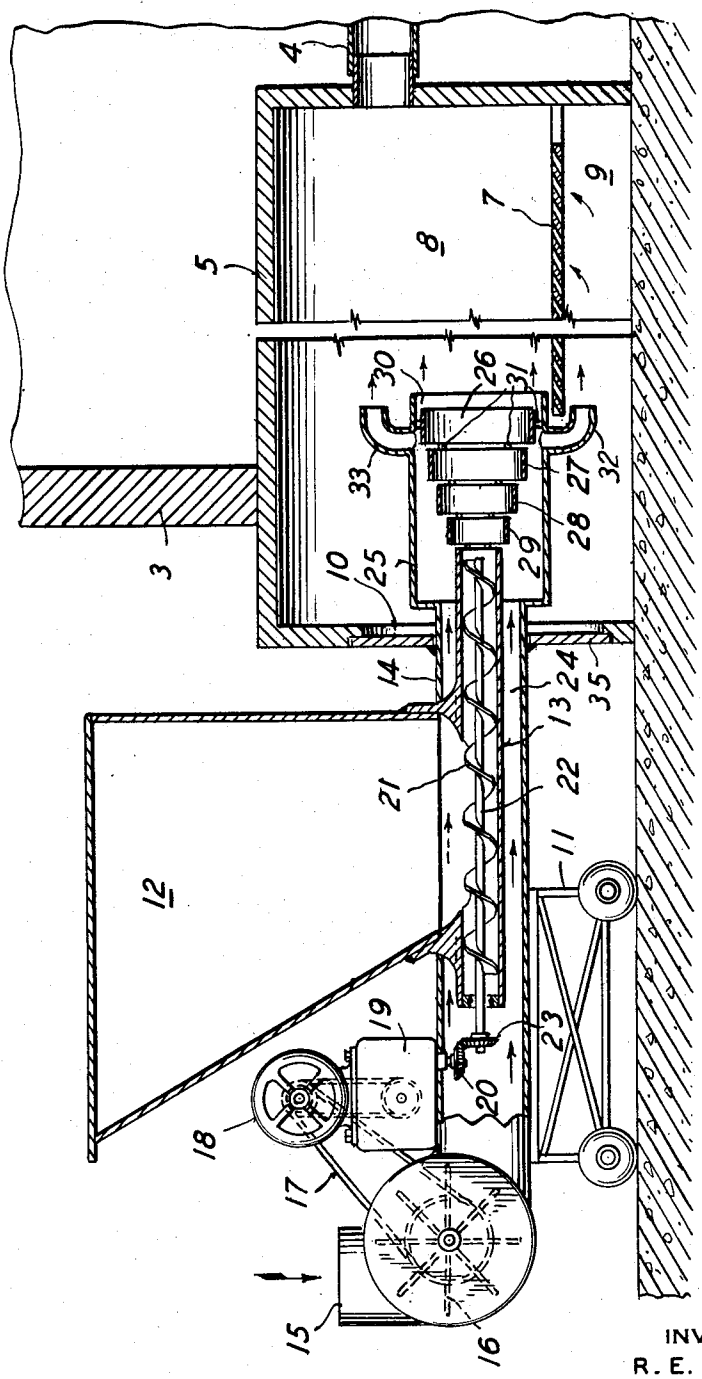
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SOLID FUEL STOKER, INCLUDING
AUXILIARY AIR FEED MEANS
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SOLID FUEL STOKER, INCLUDING AUXILIARY AIR FEED MEANS

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This invention relates to improvements in stokers, and more particularly to a stoker designed to furnish solid fuel such as powdered coal, and air for the combustion thereof, to the fire box of a tobacco curer, or the like.

The primary object of the invention is to provide a portable stoker having a discharge nozzle of unique design and adapted to be projected into a fire box for supplying a mixture of powdered fuel onto the grate thereof, as well as combustion air into the fire box above and below the grate.

A still further object is to furnish a stoker of the above character with a common means for operating a fuel feeding worm and the air blower.

With the foregoing objects outlined and with other objects in view which will appear as the description proceeds, the invention consists in the novel features hereinafter described in detail, illustrated in the accompanying drawing, and more particularly pointed out in the appended claims:

The single sheet of drawing illustrates a stoker exhibiting the invention in vertical section and partly in elevation cooperating with the fire box of a tobacco curer.

Referring to the drawing, 3 designates the walls of a conventional tobacco barn, having in the lower portion thereof, a horizontally arranged heating flue 4 which extends in a circuitous manner from a fire box 5 to a chimney or stack (not shown). All of these parts are of conventional construction and the fire box is provided with a horizontal grate 7, separating a combustion chamber 8 from an ash pit 9. The outer end of the fire box is provided with a doorway 10 by which access is had to the interior of the fire box from the exterior of the barn.

With such a conventional structure, I will employ a wheel-supported carriage 11 on which is mounted a hopper 12 to receive powdered coal. The hopper is rigidly connected at its lower end to an inner horizontal tube 13 arranged within, and in spaced relation to, an outer tube 14, rigidly connected with the carriage and hopper.

The outer end of the tube 14 is provided with an air inlet 15, and interposed in the tube is a fan or blower 16, driven by any suitable means, such as a belt 17, from a prime mover 18. The latter is mounted on a reduction gear box 19, supported by the carriage 11, and the prime mover by any suitable transmission means, drives through gearing in the box, a miter gear 20 positioned within the tube 14. A screw conveyor 21 has a shaft 22 journalled in the inner tube, and

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the shaft is provided at its outer end with a miter gear 23 meshing with, and driven by, gear 20.

As the inner tube is spaced from the outer one, the air forced by the blower travels through a substantially annular passageway 24, so as to cool the conveyor before the air is discharged into an enlarged sleeve 25 fixed to the inner end of the tube 14. Such sleeve functions as the casing of a nozzle in which there is an apertured conical structure, formed in the present example, of a series of spaced members or rings 26, 27, 28 and 29, of gradually increasing diameter from the outlet end of the tube 13 to the discharge end 30 of the sleeve, so as to form a throat flaring toward the discharge end of the nozzle. The rings may be connected to one another and to the sleeve by any suitable means, such as spaced joints 31 so as to allow the air forced into the sleeve by the blower to enter each ring through one end thereof, and after commingling with the powdered coal, or the like, to travel with it into combustion chamber 8.

To insure perfect combustion, the sleeve is provided with hollow elbows 32 and 33, respectively, for discharging air below the grate and also into the upper portion of the fire box. The sleeve may also be provided with lateral elbows (not shown) so as to discharge air into the opposite side portions of the fire box. As the mouths of all the elbows are directed toward the inner end of the fire box, it is obvious that the stream of powdered fuel and air, in travelling over the grate, will be substantially surrounded by longitudinally travelling streams of air, and this will result in complete combustion of the fuel.

It will be observed that the doorway 10 is of sufficient size to permit the nozzle and its projecting elbows to be introduced into the fire box, or to be removed therefrom, and when the nozzle is within the fire box, the doorway may be closed by a door 35, carried by the stoker, if desired.

From the foregoing, it is believed that my improved stoker and the operation thereof may be readily understood, and it is evident that changes may be made in the details disclosed without departing from the spirit of the invention, as expressed in the following claims:

What I claim and desire to secure by Letters Patent is:

1. A stoker of the character described comprising inner and outer tubes spaced from one another to provide an air passageway, means for forcing air through said passageway, means for feeding solid fuel into the inner tube, a nozzle operatively

connected to one end portion of the outer tube, a conveyor arranged in the inner tube for feeding said fuel into the nozzle, a series of spaced members arranged in the nozzle and forming a throat flaring from one end of the inner tube toward the outer end of the nozzle, whereby fuel discharged from the inner tube will mix with air from the passageway, discharged into the throat through the spaces between said series of members, and auxiliary means for discharging air from the peripheral portion of the nozzle and for directing it forwardly away from the nozzle and in spaced relation to the axis thereof.

2. A stoker of the character described comprising inner and outer tubes spaced from one another to provide an air passageway, means for forcing air through said passageway, means for feeding solid fuel into the inner tube, a nozzle operatively connected to one end portion of the outer tube, a conveyor arranged in the inner tube for feeding said fuel into the nozzle, a series of spaced members arranged in the nozzle and forming a throat flaring from one end of the inner tube toward the outer end of the nozzle, whereby fuel discharged from the inner tube will mix with air from the passageway, discharged into the throat through the spaces between said series of members, and auxiliary means for discharging air from the peripheral portion of the top and bottom of the nozzle and for directing such air forwardly away from said nozzle and in spaced relation to the axis thereof.

3. A stoker of the character described comprising inner and outer tubes spaced from one another to provide an air passageway, means for forcing air through said passageway, means for feeding solid fuel into the inner tube, a nozzle operatively connected to one end portion of the outer tube, a conveyor arranged in the inner tube for feeding said fuel into the nozzle, a series of spaced members arranged in the nozzle and forming a throat flaring from one end of the inner tube toward the outer end of the nozzle, whereby fuel discharged from the inner tube will mix with air from the passageway, discharged into the throat through the spaces between said series of members, and upper and lower hollow elbows connected to the peripheral portion of the nozzle for discharging air forwardly from the nozzle in spaced relation to the axis thereof.

4. A stoker of the character described comprising inner and outer tubes spaced from one another to provide an air passageway, means for forcing air through said passageway, means for feeding solid fuel into the inner tube, a substantially cylindrical sleeve-like nozzle operatively connected to the discharge end portion of the outer tube, means in the inner tube for feeding said fuel into the sleeve-like nozzle, a series of spaced substantially cylindrical rings arranged in the nozzle substantially concentric with the axis of the inner tube and forming a throat flaring toward the discharge end of the nozzle, said rings varying in diameter with the smaller ring arranged to directly receive fuel discharged from the inner tube, said passageway communicating with the throat, and circumferentially spaced conduit members carried by the periphery of the sleeve-like nozzle directing air from said passageway forwardly of the nozzle as a plurality of streams spaced outwardly from the axis of the nozzle.

5. In combination with a fire box having an internal grate, a doorway at one end of the fire box, and means at the opposite end of the fire box for discharging hot gases of combustion from the same, a stoker comprising inner and outer tubes provided with discharge ends extending through said doorway into the fire box, said tubes being spaced apart to provide an air passageway, means for feeding solid fuel into the inner tube, a nozzle operatively connected to the discharge end portion of the outer tube, a conveyor arranged in the inner tube for feeding said fuel into the nozzle, a series of spaced members arranged in the nozzle and forming a throat flaring from the discharge end of the inner tube toward the discharge end of the nozzle, whereby fuel discharged from the inner tube will mix with air from the passageway, discharged into the throat through the spaces between said series of members, said throat being positioned above the grate, and means for discharging air from the nozzle beneath the grate.

6. In combination with a fire box having an internal grate, a doorway at one end of the fire box, and means at the opposite end of the fire box for discharging hot gases of combustion from the same, a stoker comprising inner and outer tubes provided with discharge ends extending through said doorway into the fire box, said tubes being spaced apart to provide an air passageway, means for feeding solid fuel into the inner tube, a nozzle coaxial with the outer tube and operatively connected to the discharge end portion of the outer tube, said nozzle discharging toward the first mentioned means, a conveyor arranged in the inner tube for feeding said fuel into the nozzle, a series of concentric spaced members arranged in the nozzle coaxial therewith and forming a throat flaring from the discharge end of the inner tube toward the discharge end of the nozzle, whereby fuel discharged from the inner tube will mix with air from the passageway, discharged into the throat through the spaces between said series of members, said throat being positioned above the grate, and auxiliary means for discharging air from the nozzle into the fire box from above the throat.

7. In combination with a fire box having an internal grate, a doorway at one end of the fire box, and means at the opposite end of the fire box for discharging hot gases of combustion from the same, a stoker comprising inner and outer tubes provided with discharge ends extending through said doorway into the fire box, said tubes being spaced apart to provide an air passageway, means for feeding solid fuel into the inner tube, a nozzle operatively connected to the discharge end portion of the outer tube, a conveyor arranged in the inner tube for feeding said fuel into the nozzle, a series of spaced members arranged in the nozzle and forming a throat flaring from the discharge end of the inner tube toward the discharge end of the nozzle, whereby fuel discharged from the inner tube will mix with air from the passageway, discharged into the throat through the spaces between said series of members, said throat being positioned above the grate, and means for discharging air from the nozzle into the fire box, above the throat and below the grate.

8. A portable stoker of the character described comprising a carriage having a fuel hopper at the medial portion thereof, inner and outer concentric tubes arranged substantially horizontally on the carriage and spaced from one another to provide an air passageway, a blower mounted on the carriage for forcing air through said passage-

way toward the discharge end of the passageway, said hopper communicating with the inner tube, a conveyor in the inner tube for forcing fuel toward the discharge end of the latter, means including a prime mover mounted on the carriage and driving the blower and conveyor, a nozzle mounted on the discharge end portion of the outer tube, a series of spaced collars arranged in the nozzle coaxially with the axis of the tubes and forming a throat flaring from the discharge end of the inner tube toward the discharge end of the nozzle, whereby fuel discharged from the inner tube will mix with air from the passageway, discharged into the throat through said series of members, and means for directing air from the passageway above and below said collars in directions substantially parallel with respect to the axis of said tubes.

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