July 15, 1952 M. MUHLENKORT 2,603,207

AIR-HEATING FURNACE FOR GRAIN DEHYDRATION

Filed Aug. 21, 1947 2 SHEETS—SHEET 1

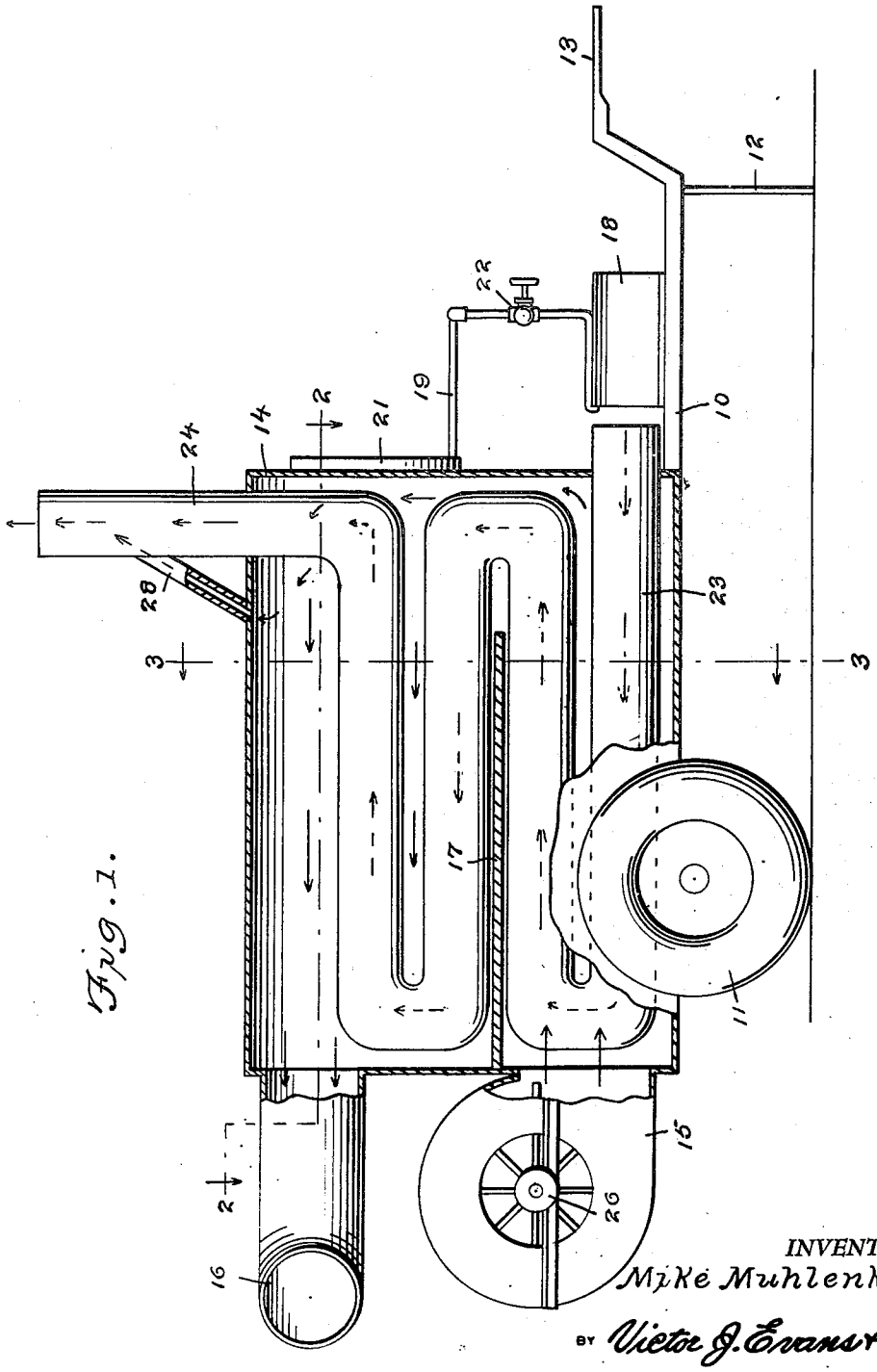


Fig. 1.

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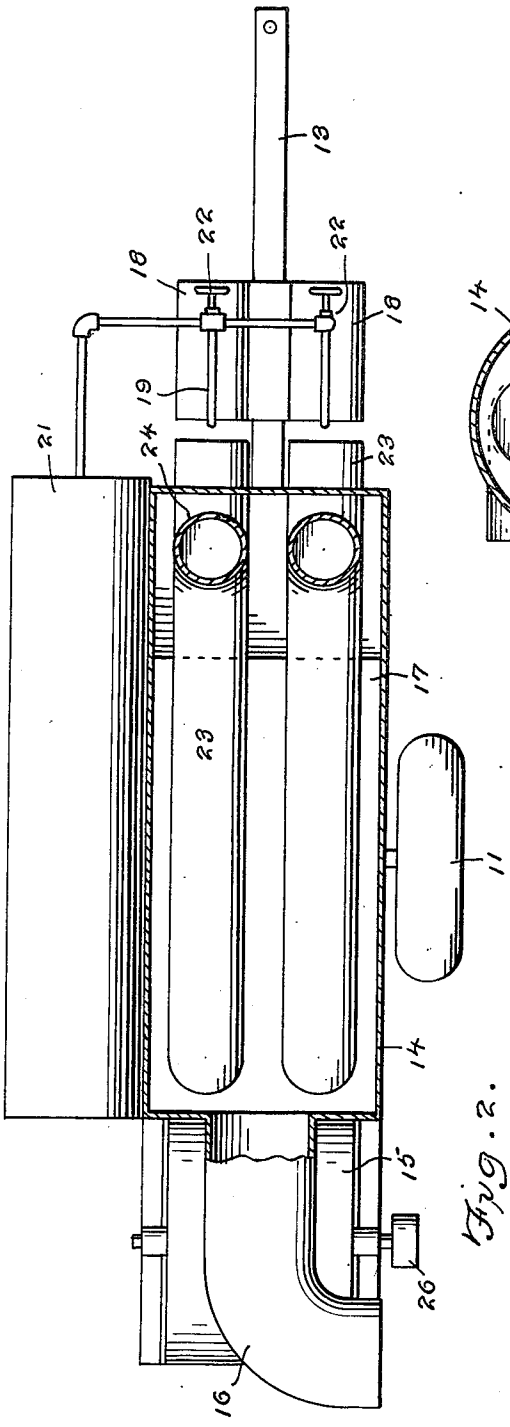


Fig. 2.

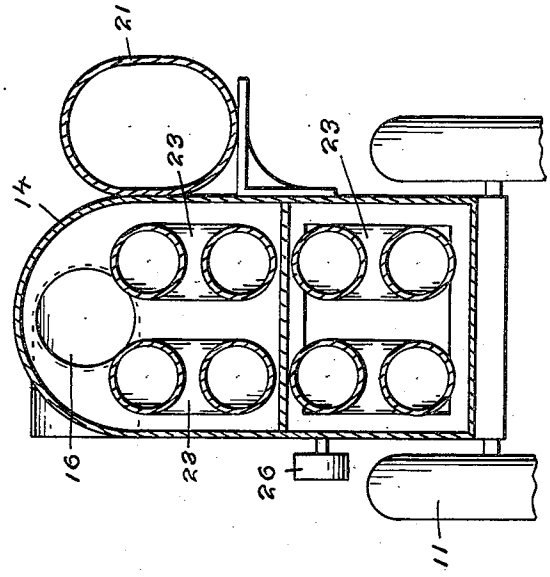


Fig. 3.

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AIR-HEATING FURNACE FOR GRAIN DEHYDRATION

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3 Claims. (Cl. 126—110)

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This invention relates to dehydrating equipment and more particularly to such equipment as may be used for dehydrating corn and other grains.

It is an object of the present invention to provide dehydrating equipment which is portable, compact and so constructed as to effectively and efficiently heat air to be extended from the same to dehydrate grain.

It is another object of the present invention to provide dehydrating equipment wherein the cooled air applied by a blower is directed around the tubes which are supplied with the burner flames at the location along the tubes where the burner flames would contact the same so that a maximum cooling of the tubes can be effected with the new cold air to prevent the tubes from becoming damaged by the flames and wherein the heated air rises through the equipment with the burner gases to extract the heat from the gases and wherein certain of the air which is cooled is, at a high point, injected into the burner gases to have a maximum draft through the burner gases pipe.

Other objects of the present invention are to provide dehydrating equipment for grain which is of simple construction, inexpensive to manufacture and efficient in operation.

For other objects and for a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawing, in which

Fig. 1 is a side elevational view of my dehydrating equipment with portions broken away and shown in section.

Fig. 2 is a horizontal cross-sectional view taken through the equipment and on line 2—2 of Fig. 1.

Fig. 3 is a transverse cross-sectional view, in elevation, taken on line 3—3 of Fig. 1.

Referring now to the figures, 10 represents a trailer frame which is supported on its rear end upon wheels 11 and upon its front end when not being pulled by a support pin or prop 12. A tongue 13 extends forwardly for the attachment of the equipment to a tractor or other like device for the purpose of transporting the equipment. On the frame is a large casing 14 providing a housing through which air is extended by a blower 15 attached to the rear end of the casing, the heated air passing from the rear of the equipment and outwardly through a top flue 16 above the blower to the grain being dehydrated. Fresh cold air is taken in through the blower and extended through the casing 14. Within the casing is a baffle 17 for causing the air upon being forced

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through the casing to take a circuitous path in reaching the flue 16.

Ahead of the casing 14 and on the frame 10 are two burners 18 arranged side by side and supplied with fuel through pipes 19 respectively leading from a fuel supply tank 21. To control the supply of fuel there is provided hand valves 22 in the respective pipe lines 19.

Within the casing 14 and extending from a low point within the casing there is extended two large pipes 23 which are bent to pass in serpentine fashion upwardly through the casing and terminating in a chimney 24 leaving the top of the casing. These pipes extend forwardly and outwardly of the casing 14 to receive the flames from the burner 18 in order to conduct them away from the burner and upwardly and through the casing whereby to heat the air which is forced into the casing by the blower 15. It will be noted that the blower enters the casing at a low point and such that cold air will first be directed over the heated pipe 23 at a location where it is receiving the hottest flame whereby to protect the pipes and prevent the same from being damaged as a result of becoming too hot. The coldest and most dense air is directed to the hottest part of the heater pipe 23. By controlling the amount of fuel passing to the burners and regulating the speed of the blower any desired temperature of the air leaving through the flue 16 can be obtained and as well the volume of air which is being extended from the equipment. The blower 15 has a belt pulley 26 to which can be attached a belt extending from a power plant or electric motor, not shown.

In order to be certain of a good draft through the pipe 23, there is provided an injector pipe 28 extending from the top of the casing 14 to the pipe 24 at a point above where it leaves from the top of the casing. Heated air will be directed upwardly through the pipe 28 and will draw with it the gases from the chimney 24 and cause a draft to be created in the lower regions of the pipe 23.

The equipment will accordingly supply heated air which is free of gases which would be injurious to the grain being dehydrated. A hot blast of air is had free of the burner gases.

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

I claim:

1. In a portable grain dehydrator, the combination which comprises a frame, a substantially

hollow rectangular shaped housing having a front end, a rear end, upper and lower panels and side walls mounted on said frame, said housing having a horizontally disposed baffle extended inwardly from the rear end to a point spaced from the front end thereof and from side to side of the housing, whereby to define a U-shaped path for the air to be heated therein, the rear end of the housing having an inlet opening therein positioned below the baffle, said rear end of the housing having an outlet opening in the upper part thereof positioned above the baffle and spaced from the upper end of the said rear end of the housing, a heat conveying pipe extended inwardly into the housing through the front end below the baffle to a point spaced from the rear end thereof, upwardly and forwardly with a U-bend also below the baffle to a point spaced from the front end, upwardly through the space at the end of the baffle at the front end of the housing, rearwarly above the baffle to a point spaced from the rear end of the housing, forwardly with still another U-bend to a point spaced from the front of the housing and then upwardly through an opening in the upper panel of the housing and opening to the atmosphere, a burner positioned to exhaust gases into the lower end of the said pipe and at the forward end of the housing, a blower carried by the device and positioned to discharge into the housing through the said inlet opening below the baffle, and a hot air connection extended from the said outlet opening in the rear end of the housing.

2. In a portable grain dehydrator, the combination which comprises a frame, a substantially hollow rectangular shaped housing having a front end, a rear end, upper and lower panels and side walls mounted on said frame, said housing having a horizontally disposed baffle extended inwardly from the rear end to a point spaced from the front end thereof and from side to side of the housing, whereby to define a U-shaped path for the air to be heated therein, the rear end of the housing having inlet openings therein positioned below the baffle and an outlet opening in the rear end positioned above the baffle and spaced from the upper end of the said rear end of the housing, heat conveying pipes extended inwardly into the housing through the front end below the baffle to a point spaced from the rear end thereof, upwardly and forwardly with U-bends also below the baffle to a point spaced from the front end, upwardly through the space at the end of the baffle at the front end of the housing, rearwardly above the baffle to a point spaced from the rear end of the housing forwardly with other U-bends to a point spaced from the front end of the housing and then upwardly through an opening in the upper part of the housing and opening to the atmosphere, burners positioned to exhaust gases into the lower ends of the said pipes and at the forward end of the housing, blowers carried by the device and positioned to exhaust into the housing through the said inlet openings below the baffle, and a hot air connection extended from the said outlet opening in the rear end of the housing.

3. In a portable grain dehydrator, the combination which comprises a frame, a substantially hollow rectangular shaped housing having a front end, a rear end, upper and lower panels and side walls mounted on said frame, said housing having a horizontally disposed baffle extended inwardly from the rear end to a point spaced from the front end of the housing and from side to side of the housing, whereby to define a U-shaped path for the air to be heated therein, the rear end of the housing having inlet openings therein positioned below the baffle, said rear end of the housing having an outlet opening in the upper part thereof positioned above the baffle and spaced from the upper end of the said rear end of the housing, heat conveying pipes extended inwardly into the housing through the front end below the baffle to a point spaced from the rear end thereof, upwardly and forwardly with U-bends also below the baffle to a point spaced from the front end, upwardly through the space at the end of the baffle at the front end of the housing, rearwardly above the baffle to a point spaced from the rear end of the housing, forwardly with then other U-bends to a point spaced from the front end of the housing and then upwardly through an opening in the upper panel of the housing and opening to the atmosphere, burners positioned to exhaust gases into the lower ends of the said pipes and at the forward end of the housing, blowers carried by the device and positioned to discharge into the housing through the said inlet openings below the baffle, a hot air connection extended from the said outlet opening in the rear end of the housing and spaced from the upper end thereof, a bypass connection extended diagonally from points in the upper part of the housing to the pipes passing to the atmosphere, and a fuel tank with a connection to the burner carried by and positioned on one side of the housing.

MIKE MUHLENKORT.

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