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 APPARATUS FOR OPERATING FURNACES WITH FINE FUEL.
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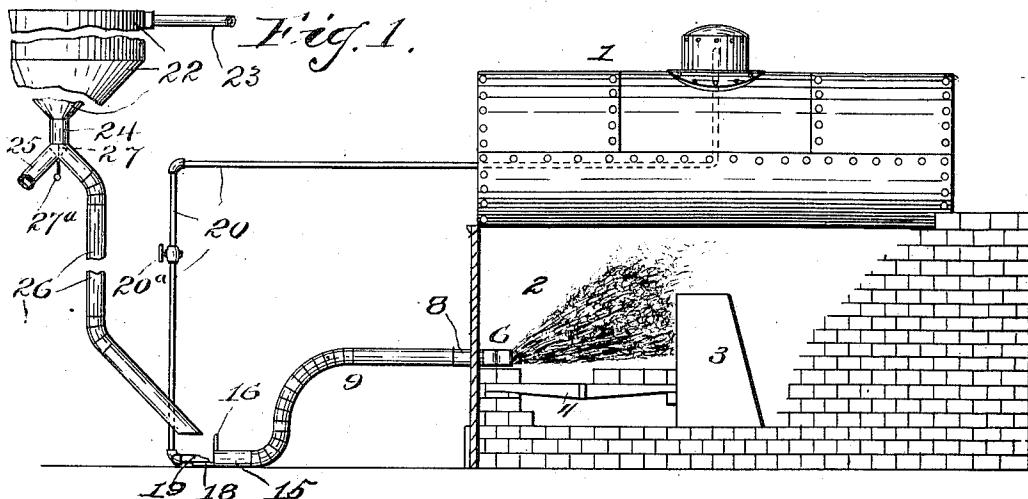


Fig. 2.

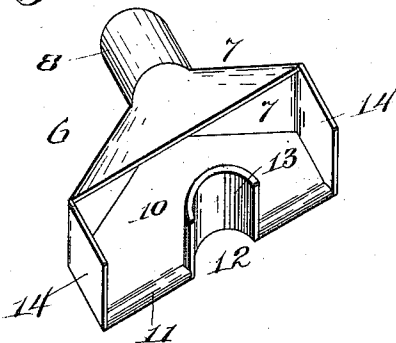


Fig. 3.

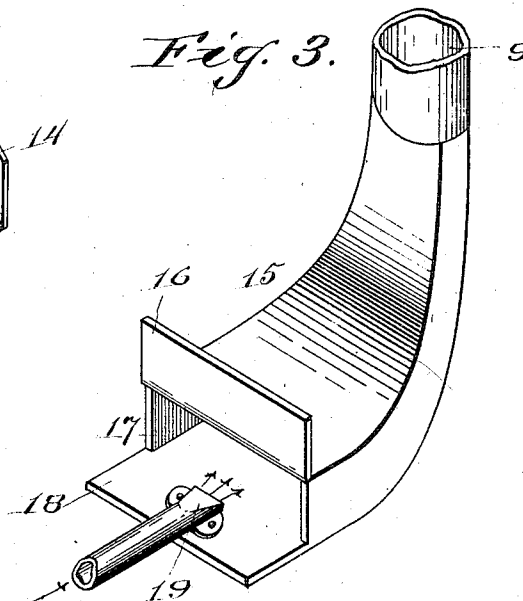
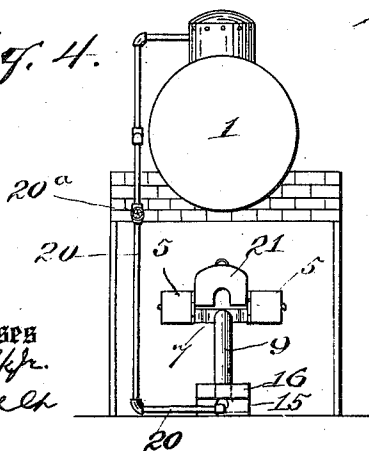
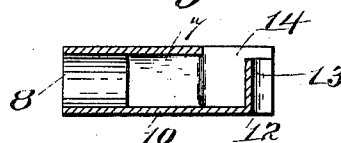


Fig. 4.



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Fig. 5.



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APPARATUS FOR OPERATING FURNACES WITH FINE FUEL.

1,006,259.

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To all whom it may concern:

Be it known that we, ISAAC H. MONCRIEFF and MUMM REID, citizens of the United States, residing at Willits, in the county of Mendocino and State of California, have invented certain new and useful Improvements in Apparatus for Operating Furnaces with Fine Fuel, of which the following is a specification.

This invention relates to furnace fuel feeders and pertains especially to the class of devices or apparatus for feeding disintegrated or finely comminuted fuel such as saw dust, coal dust, shavings and the like, to furnaces for consumption.

The object of the invention is to provide an apparatus of such construction and arrangement that it will automatically feed fine fuel of various character to a special burner located in the furnace door opening for burning such fine fuel within the fire-box instead of the ordinary fuel as commonly employed.

A further object of the invention is to provide an apparatus of novel and peculiar construction and arrangement of parts for the purpose of collecting refuse material, such as coal dust, saw dust, shavings and the like, from a furnace floor, or adapted to receive such or similar fuel from its place of deposit or storage, and feed the same to a specially devised burner within the fire-box for combustion.

A still further object of the invention is to provide a special burner for holding and burning fine fuel, and to furnish a specially designed floor nozzle connected with the burner for collecting and receiving fine fuel, such nozzle having a steam pipe connection with the boiler of a furnace and connected with the burner for forcing fine fuel from the nozzle to the burner for combustion within the fire-box of the furnace.

Various other objects, advantages and improved results are attainable in the practical application and working of the invention.

In the accompanying drawings forming a part of this application: Figure 1 is a sectional elevation showing the application of the invention to an ordinary furnace. Fig. 2 is a detail perspective view of the burner.

Fig. 3 is a detail perspective view of the feed or floor nozzle. Fig. 4 is a front view of a furnace showing the device applied thereto. Fig. 5 is a sectional view of the burner.

The same reference numerals denote the same parts throughout the several views of the drawings.

In carrying out the invention it is applicable to any of the ordinary furnaces commonly used for or in connection with saw-mills, shops or similar establishments, such furnace is shown in the accompanying drawings simply for the purpose of illustrating the invention, and such furnace has a steam boiler 1, a fire-box 2, a bridge-wall 3, grate-bars 4 and the usual furnace doors 5. The grate bars are supported at their rear end by the bridge-wall, and the front end of the grate-bars is supported by bricks of the front wall of the furnace, certain of which bricks rest upon and overlap the front end of the said bars and the latter are partially closed or covered with bricks or by other suitable means so as to leave only sufficient grate space to provide proper draft. A fine fuel burner 6 is introduced into the fire-box through the opening of the furnace doors 5, for the purpose of receiving and burning such fine fuel therein and for preventing what is commonly called "back fire."

The burner 6, has a funnel-shaped head 7, from which projects a tube 8, forming a fuel feed opening and also means for connecting a flexible pipe 9, with the burner; the base or bottom 10 of the burner has a ledge 11, and a central recess 12 from which a semi-circular deflector 13 projects upwardly in front of the feed opening, but removed therefrom, and terminates in a plane below the plane of the top of the burner, and the bottom 10 is connected at the ends with the head 7, by flanges 14. The recess 12, and the deflector form a vertical draft passage from the ash-pit or fire box through the bottom 10, during the feeding of the fuel to said bottom for combustion.

The feed or floor nozzle 15 is attached to or connected with the pipe 9, and has an upwardly extending baffle-plate or flange 16 standing vertically above the nozzle and flush with the nozzle-mouth 17, the bottom

of the nozzle is extended outwardly from said mouth and forms a floor-plate 18, which is provided with a jet-spray 19, to which a steam-pipe 20, from the boiler is connected; the steam pipe 20 being provided with a valve 20^a.

In applying the burner to a furnace, the furnace doors are opened and remain so during the working of the furnace and the operation of the burner, the burner is inserted into the fire-box through the furnace door-opening, and such opening is closed by a temporary slide 21, which fits over the burner-nipple. When it is desired to close the furnace doors the slide and the burner are removed.

A fine fuel feed hopper 22, is connected with an inlet pipe 23 leading from a planing mill blower (not shown) commonly used, a pipe 24 is attached to the hopper and has branch pipes 25 and 26, controlled by a gate 27, which is operated by means of a depending rod 27^a, or other suitable means for directing the fuel from the pipe 24 either to the pipe 25 for depositing the fuel upon the furnace floor or to the pipe 26 which discharges the fuel into or at the mouth of the feed or floor nozzle, whence the steam jet forces the fuel through the nozzle to the burner by way of the pipe connecting the burner and the nozzle. When a flexible pipe is used the nozzle may be moved from place to place on the furnace floor for collecting fuel.

It will be understood that the successful operation of the burner depends upon the steam supply to the fuel, therefore in the event of accident or damage to the furnace or any of its parts, or when it is desired to stop the operation, the supply of steam to the nozzle is cut off, thus preventing "back draft" and avoiding the usual "drawing of fires."

It is obvious that when the fuel leaves the burner such fuel is in spray form and instantly becomes a mass of flames, hence complete combustion without waste or smoke. It is also obvious that such parts of a furnace as are usually exposed to fire and heat are protected and preserved, and that the consumption of fuel, compared to that of the ordinary furnace, is reduced to a minimum.

Having thus described our invention what we claim as new and desire to secure by Letters Patent is:

1. A fine fuel burner for furnaces, such burner having a fuel feed opening and comprising a partially covered base or bottom for openly holding the fuel during combustion, and a deflector forming a draft passage through the bottom perpendicular to the feed opening and terminating below the plane of the burner top.

2. A fine fuel burner attachment for furnaces such burner having an opening for the passage of fuel to the burner, and a semi-circular deflector at the edge of the burner base and in front of said opening and forming a draft passage through the base of the burner and between the deflector and the top of the burner.

3. A fine fuel burner attachment for furnaces such burner comprising a head having an opening for the passage of fuel to the burner, a base or bottom upon which the fuel is burned, a deflector projecting from the base in front of said opening, and a top extending partially over the base so as to leave a passage or space between said top and the top of the deflector.

4. A fine fuel burner attachment for furnaces such burner having an opening for the passage of fuel thereto, a base projecting beyond the top of the burner for openly holding the fuel during combustion, and a deflector extending from the projecting portion of the base in front of said opening and terminating below the top of the burner.

5. A fine fuel burner for furnaces such burner having a base or bottom upon which the fuel is burned, a top partially covering the base, side flanges extending from the base to the top, and a deflector projecting from the base between said flanges and standing apart from the said top and in front of the burner feed opening.

6. A feed nozzle for fine fuel burners such nozzle having an open mouth, a floor plate extending from the bottom of the mouth, a jet-spray secured to the plate in front of the mouth, and a baffle plate projecting from the top of the mouth.

7. The combination, with a fine fuel burner adapted to be inserted into the fire box of a boiler furnace through the door of the latter, of a feed nozzle having an open mouth adapted to collect fuel, a jet-spray secured to the floor plate of the nozzle and leading into the mouth, a pipe leading from the boiler and attached to said jet, and a flexible pipe connecting the burner with the nozzle upon the outside of the furnace.

8. The combination, with a furnace, of a fine fuel burner having a head fitting the furnace door, a base or bottom projecting from the head into the furnace for openly holding the fuel during combustion, a ledge or raised portion at the edge of the base and means connected with the burner-head for feeding fuel to the burner under steam pressure from the furnace.

9. The combination with a fine fuel furnace, of a fine fuel burner adapted to be inserted through the furnace door and having a base or bottom extending into the fire box of the furnace for openly holding the fuel during combustion, a fuel induction

pipe attached to the burner so as to discharge upon the base, a vertical deflector at the edge of the base, a floor nozzle attached to the other end of said pipe, and a steam
5 pipe leading from the boiler and terminating in the receiving end or mouth of the floor nozzle.

In testimony whereof we affix our signatures in presence of two witnesses.

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Witnesses:

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