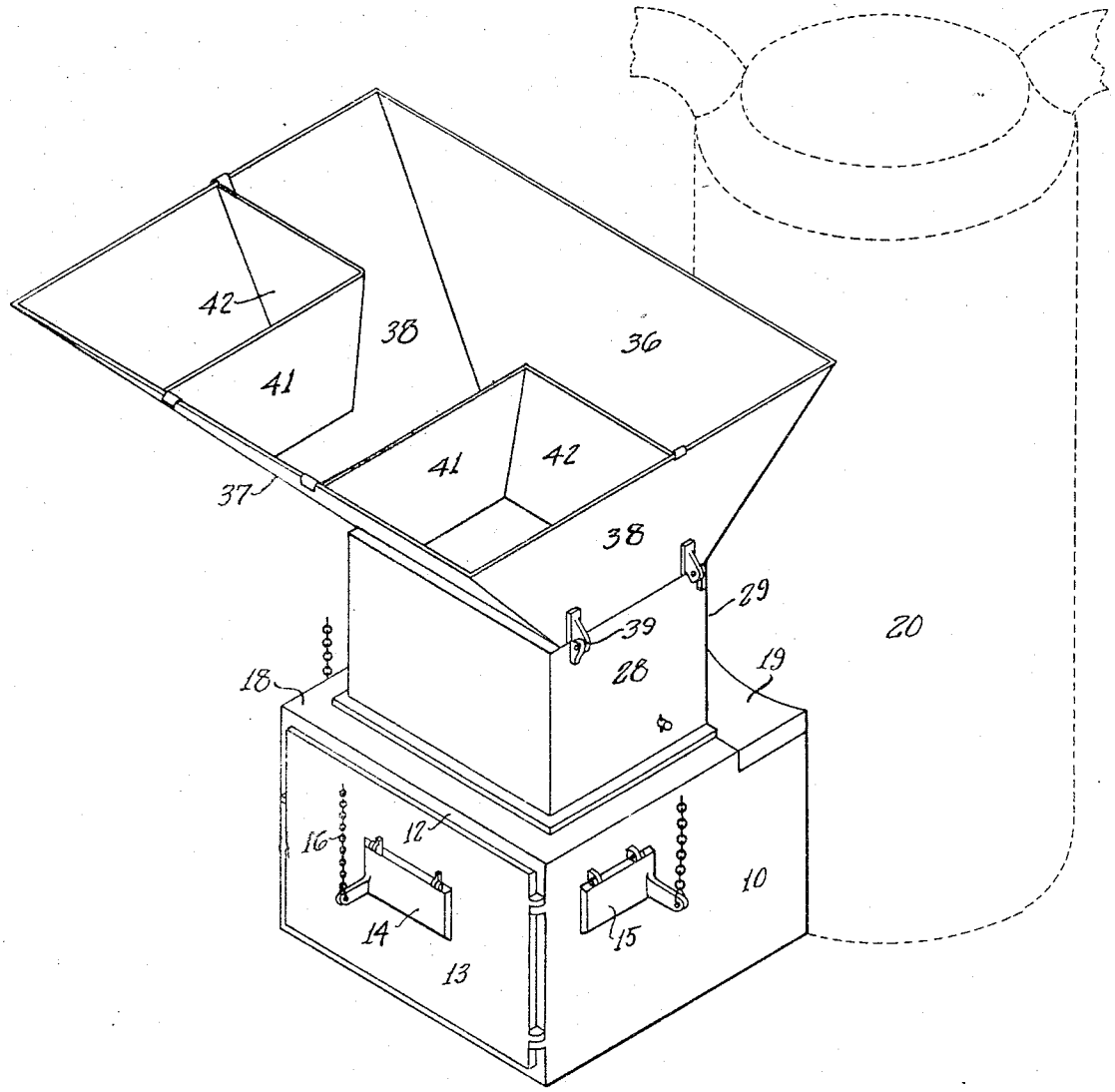
May 5, 1931. V. C. SNYDER 1,804,285

SAWDUST BURNER

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FIG. 1



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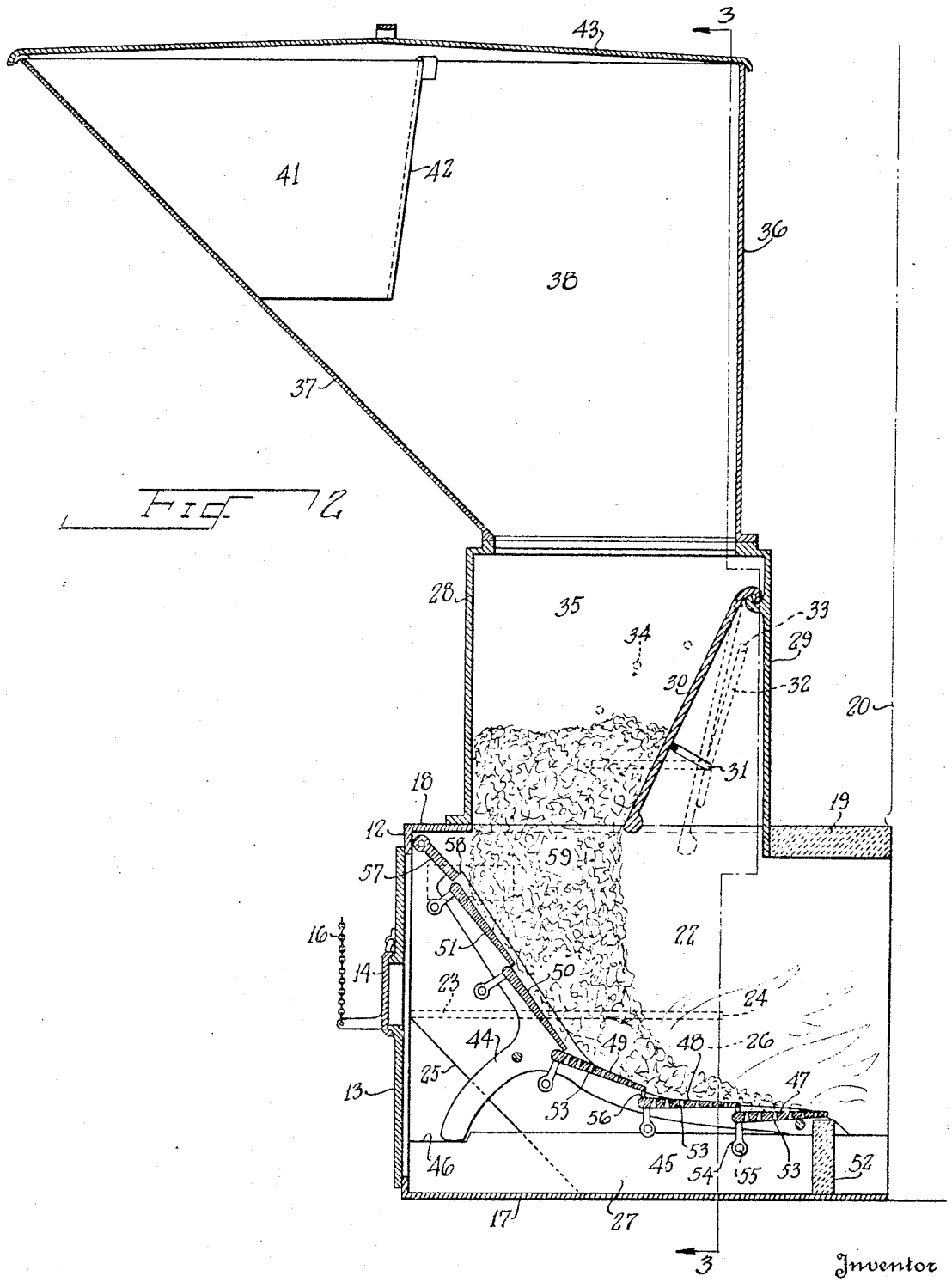


FIG. 2

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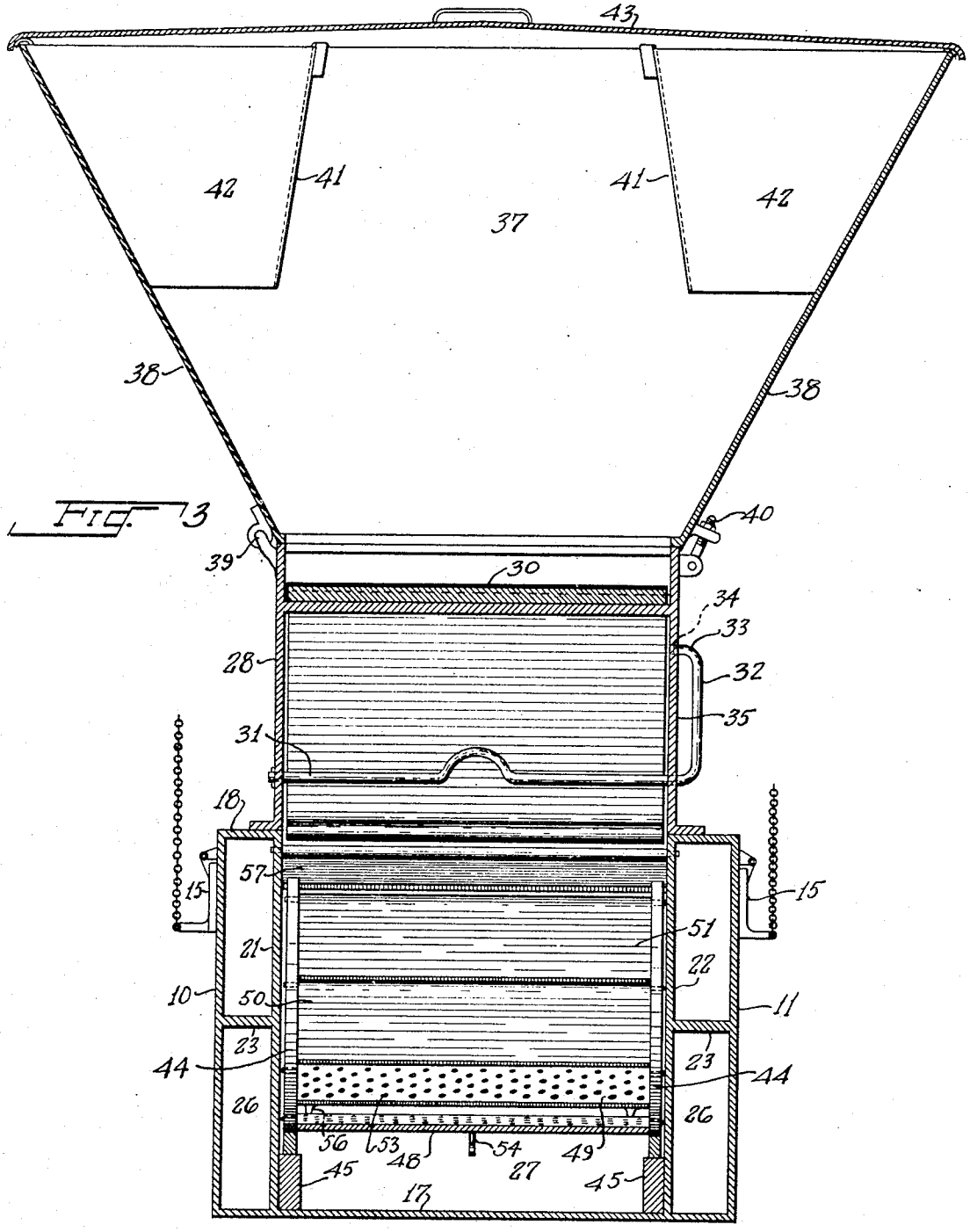


Fig. 3

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UNITED STATES PATENT OFFICE

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SAWDUST BURNER

Application filed September 4, 1928. Serial No. 303,749.

This invention relates generally to the burning of cut fuel with particular reference to wood in the form of sawdust, shavings and hogged fuel.

The main object of this invention is to provide a burner which will require only very ordinary skill to successfully operate same and which will almost be incapable of being improperly operated.

The second object is to construct a special form of grate which will provide the most efficient firing and which can be placed in only one position in which it is locked by an upper plate.

The third object is to provide a burner which will completely eliminate clogging of fuel in the hopper.

The fourth object is to so burn the fuel that there will be no possibility of a smothering action which ordinarily proceeds objectionable backfiring.

The fifth object is to provide a burner in which no draft is provided ahead of the fire and in which incoming air is delivered to the under side of the grates.

The sixth object is to construct a burner in which the pressure of the incoming fuel is directed against the uppermost portion of the grates at a point where little or no combustion is taking place.

These, and other objects, will become more apparent from the specification following as illustrated in the accompanying drawing, in which:

Figure 1 is a perspective view of the burner showing its relation to a furnace. Figure 2 is a vertical section taken through the burner. Figure 3 is a transverse vertical section taken along the line 3—3 in Figure 2.

Similar numbers of reference refer to similar parts throughout the several views.

Referring in detail to the drawing, the burner consists of a box-like structure comprising the side walls 10 and 11 and the front 12, which is provided with a cleanout door 13 provided with a damper door 14. The sides 10 and 11 are provided with draft inlet doors 15 which may be controlled in any convenient manner, while the door 14 is preferably controlled by the usual chain 16 from the floor above.

A floor 17 covers the bottom of the burner and the top 18 extends around the forward portion thereof, while a refractory plate 19 covers the rearmost portion of the burner extending to the exterior of the furnace 20.

Spaced from the walls 10 and 11 are the inner walls 21 and 22 which extend from the top 18 to the bottom 17. Between the walls 10 and 21 and the walls 11 and 22 are the horizontal partitions 23 whose rearmost ends 24 do not extend entirely to the rear of the burner.

The lowermost forward portion of the walls 21 and 22 are cut away along the faces 25 leaving openings through which air can pass from the spaces 26 into the space 27.

Over the top 18 is mounted a fuel magazine 28 against whose rearmost side 29 is hinged a plate 30 whose position is determined by the bent rod 31 provided on its outer end with a handle 32 whose tip 33 is inturned and can drop into recesses 34 in the side 35 of the fuel magazine.

On top of the fuel magazine is mounted a hopper consisting of the back 36, the front 37 and sides 38, one side 38 being joined to the fuel magazine by the hinges 39, and the other side 38 being secured to the fuel magazine by the clamp bolt 40.

The side 37 has the least amount of pitch or slope of any of the sides of the hopper. To prevent fuel from lodging or clogging in the hopper, auxiliary hoppers are formed between the sides 37 and 38 in conjunction with the sides 41 and 42. These auxiliary hoppers do not give up their fuel until the rest of the hopper is empty.

It is also desirable to provide a cover 43 for the hopper.

The grates themselves consist of a pair of side frames 44 which rest on the tracks 45 placed on the bottom 17. The tracks 45 have a depression 46 formed near the outer ends thereof, the ends of which act as stops for the frames 44. Between the frames 44 are hinged the grates 47, 48, 49, 50 and 51, the lowermost grate 47 being practically horizontal and having its swinging end

resting on the cross member 52. The grates 47 to 49 are provided with perforations 53 which are, however, not necessary in the grates 50 and 51. Each of the grates is provided near the middle of its under side close to its hinged edge with a shaker arm 54 provided with an opening 55 for a shaker hook (not shown). The grates 48 and 49 have lugs 56 on the under side of their swinging edges which rest upon the top side of the next lower grate and provide an air space through which air can flow from the space 27.

Above the grate 51 and hinged between the sides 21 and 22 is a locking plate 57 whose lower edge engages a notch 58 in the frames 44 when said frames are pushed into their proper position and prevent their getting out of this position when the locking plate is in engagement therewith.

The operation of the burner is as follows: Fuel 59 is placed in the hopper and the plate 30 is moved to a desired position by means of the handle 32. The fire having been started on the top side of the grates 47 to 51, air is admitted to the under side of the grates preferably by hand control of the opening 14 until the fire is properly started.

As the burner warms up, air which passes through the doors 15 is also heated and conducted to the under side of the grates, the quantity of the combustion improves and the entire lower portion of the grates is soon covered with burning fuel.

It will be noted that the pressure exerted by the fuel in the magazine and hopper is exerted against the uppermost grates 50 and 51 where there is little fire, after which it slides down over the lower grates 47 and 49 becoming more completely burned as it proceeds, no fresh fuel ever finding its way as far as the lower grate 47.

The result of this condition is highly beneficial inasmuch as its prevent even a momentary smothering of the flame, which is normally so disastrous in burners of this type since a momentary smothering of the flame causes a continued gas generation without the gas being consumed and the mixture thus formed becomes ignited as soon as the flames have burned through the fuel on the grates.

In other words the pressure of the oncoming fuel cannot smother the flames, a portion of the grate always being covered with burning fuel which has slidably found its way thereon rather than by having fallen directly thereon from the magazine.

It will also be seen that by this construction it is unnecessary to line the side walls of the burner since they are air cooled and the heat derived therefrom is delivered to the under side of the grates instead of being radiated into the furnace room.

I am aware that many forms of sawdust burners have been constructed in the past, I therefore do not intend to cover such devices as broadly but I do intend to cover such forms and modifications thereof as fall fairly in the appended claims.

I claim:

1. A sawdust burner having in combination a pair of side walls having air spaces formed therein and having same partially divided with a horizontal partition extending to the forward end of the walls having an air inlet opening in the top side of said partition communicating with the outer air and having an opening formed on the lowermost side of said partition passing through the inner wall, a pair of tracks mounted between said walls, a frame mounted on each track, grate bars mounted across said frame, a stop for limiting the rear movement of said frames with relation to said tracks, a latching grate for holding said frames against their stops, a fuel magazine over said grate bars having a deflector plate therein and a means for adjusting the angular position of said deflector plate for the purpose of projecting fuel against the uppermost portion of said grate bars in a manner that the weight of the fuel in the magazine shall not rest upon the lowermost grate bars.

2. In a sawdust burner the combination of a pair of side walls having air spaces formed therein through which air can be circulated into the space between said side walls, a pair of tracks between said side walls, a frame on each of said tracks, hinged grates between said frames forming a somewhat curved line, the lowermost grates being approximately horizontal and the uppermost grates inclining abruptly, the lowermost grates having means for admitting air through and between same, a magazine mounted across said side walls, a hopper over said magazine having auxiliary hoppers therein adapted to prevent a clogging of fuel in said first mentioned hopper, a cover over said hoppers, and a deflector plate hinged to the rear of said fuel magazine and sloping forwardly toward said abruptly inclined grates in a manner to cause the weight of the fuel in the magazine and hopper to be supported by said abruptly inclined grates and to cause a scouring action to take place on said less abruptly inclined lower grates.

VERNE C. SNYDER.