Aug. 11, 1931. A. PFAU 1,818,503

SAWDUST BURNER

Filed Feb. 7, 1929

FIG. 1

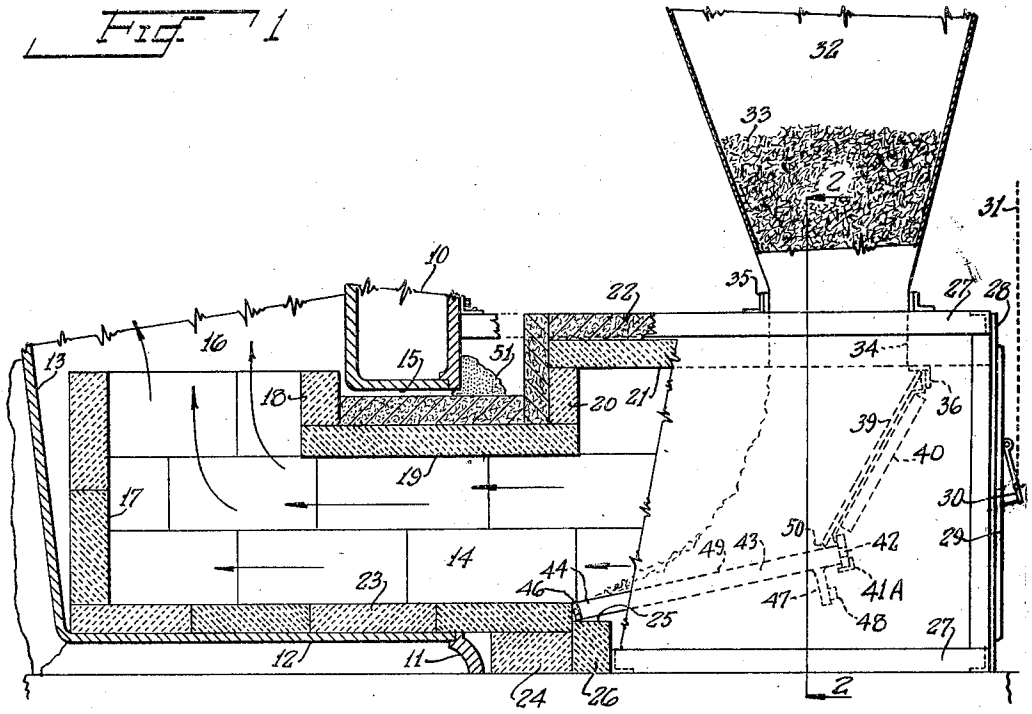


FIG. 2

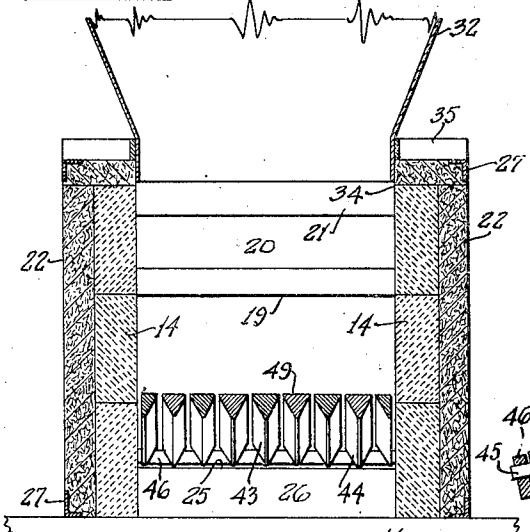


FIG. 3

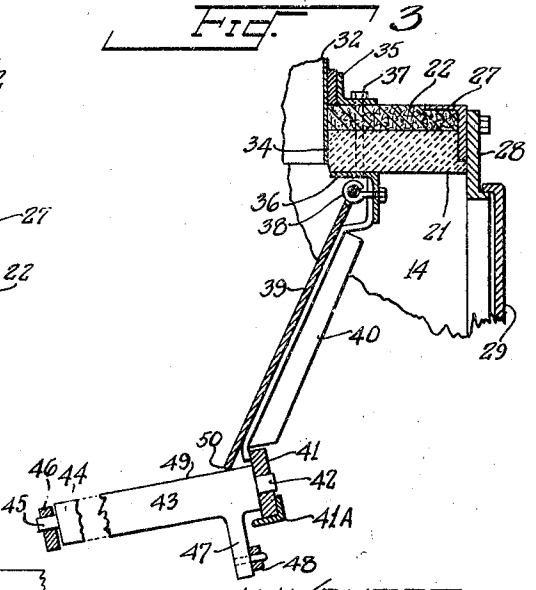
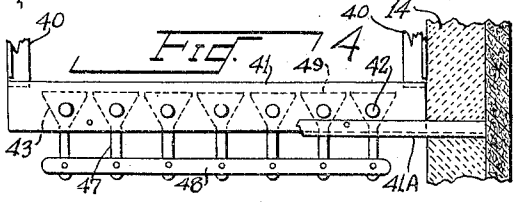


FIG. 4



INVENTOR
A. Pfau
BY C. B. Birkenbeuel.
ATTORNEY

Patented Aug. 11, 1931 1,818,503

UNITED STATES PATENT OFFICE

ANTON PFAU, OF PORTLAND, OREGON

SAWDUST BURNER

Application filed February 7, 1929. Serial No. 338,109.

This invention relates generally to sawdust burners, and particularly to that type of burner which is an auxiliary to a furnace.

The main object of this invention is to provide a burner for sawdust and cut fuel formed from wood in which there is employed a retort of refractory material which extends into the combustion zone of the furnace.

The second object is to so construct the burner that it can be formed largely from materials already in the market.

The third object is to employ a sloping grate which is not adjustable as to angularity and which does not constitute a closure for the furnace, as is the common practice.

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

Figure 1 is a side view of the burner with a portion broken away in longitudinal section. Figure 2 is a section taken along the line 2—2 in Figure 1. Figure 3 is an enlarged sectional view showing the grate hanger and apron. Figure 4 is a front view of the grate hanger and shaker bar.

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

Referring in detail to the drawings, there is illustrated the front 10 of a furnace, as well as a base ring 11 upon which rests the bottom or floor 12 of the furnace whose ash pit walls 13 are also indicated. These of course vary greatly in shape and location depending upon the furnace employed.

Referring particularly to the device it will be seen to consist of a pair of side walls 14 of refractory material, which walls extend through the ash pit door opening 15 into the ash pit 16 and then turn upwardly to form a retort which includes the rear end wall 17 and the front end wall 18 which rests upon a refractory arch 19, which, in turn, rests upon the side walls 14. The outer end of the refractory arch 19 has formed thereon a wall 20 over which is placed a cover 21 constituting the top of the burner. Insulating material 22 surrounds those portions of the refractory elements which are outside of the furnace.

The floor 12 is preferably covered with bricks 23, the outermost of which are supported by a layer of bricks 24 outside of which is formed a step 25 by means of the row of bricks 26.

A frame of structural angle bars 27 protects the corners of the insulating materials 22 and provides a means for securing the front 28, preferably of cast iron, and having mounted thereon a fire door 29 provided with a check damper 30 operable overhead by means of a chain 31.

On top of the burner is mounted a hopper 32 in which fuel 33 is placed and which finds its way into the burner through the opening 34 provided in the top section. The hopper 32 is secured to the frame 27 by means of the angle bars 35.

On the under side of the cover 21 and at the outer edge of the opening 34 is secured an angle bar 36 by means of the bolts 37 which pass through the bars 35 on the top side of the burner. To the bar 36 are secured the eye bolts 38 to which is hinged an apron 39. To the bar 36 are also secured the angle bars 40 whose lower ends are supported by the bar 41 which is supported by the angle bar 41—A whose ends are bedded in the side walls 14. The trunnions 42 of the triangular grate bars 43 journal in the bar 41, and the lowermost ends 44 are provided with trunnions 45 which journal in the bar 46 which, in turn, rests upon the bricks 26.

Each bar 43 is provided with a shaker arm 47 joined by means of the shaker bar 48 which serves as a means for shaking all of the bars in unison, and also to hold same normally with the flat side 49 uppermost. The bars 40 also serve to prevent air from passing between the side walls 14 and the apron 39.

The lower end 50 of the apron 39 rests upon the surfaces 49 of the grate bars 43 so that the apron 39 normally insures the correct positioning of the bars 43, and when the bars 43 are forcibly moved, as when shaking the grates, it provides a slight movement to the apron 39 insuring a movement of fuel thereon.

It can be seen by this construction that the

fuel is directly under the hopper and that no fuel over a predetermined amount can be admitted to the grates until some of the fuel on the grates has been burned. In other words, the rate of feeding is controlled entirely by the draft rather than by a variation in the setting of the various elements. This is done in order to prevent the parts from becoming improperly adjusted or related, which is the common cause for what is known as back firing in this class of devices, in which large quantities of fuel are allowed to slide upon a live bed of fuel, thereby smothering same, but, due to the heat, continues to produce a gas which mixes with the air above and below the grates, which ignites with explosive force as soon as the fire again burns through the fuel. Thus it can be seen that this objectionable feature is entirely eliminated from this class of devices.

It is desirable to hermetically seal the opening between the ash pit door 15 and the portion of the burner which passes through same by means of a suitable cement 51.

It will thus be seen that the device consists of a gas-producing section in which the fuel is gasified and partially burned, and a retort which is within the furnace itself in which the major portion of the combustion occurs, and in which the heat is delivered to the furnace itself. The gases find their way from the gas producer to the retort through the ash pit door, as can be easily understood.

I claim:

A sawdust burner consisting of a combustion chamber disposed on the exterior of a furnace in combination with an auxiliary upwardly discharging combustion chamber mounted in the interior of a furnace, a connecting passageway joining said combustion chambers, a fuel hopper adapted to discharge fuel into said first mentioned combustion chamber, an inclined apron mounted under said hopper, a plurality of longitudinally sloping grate bars having their upper ends under the lower end of said apron and their lower ends resting on the bottom of said passageway, and draft controlling means in said first mentioned combustion chamber whereby air may be admitted to the under side of said grate bars.

ANTON PFAU.