July 10, 1928.

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W. R. WOOD

PULVERIZED FUEL BURNER

Filed Feb. 1, 1926

Fig: 1.

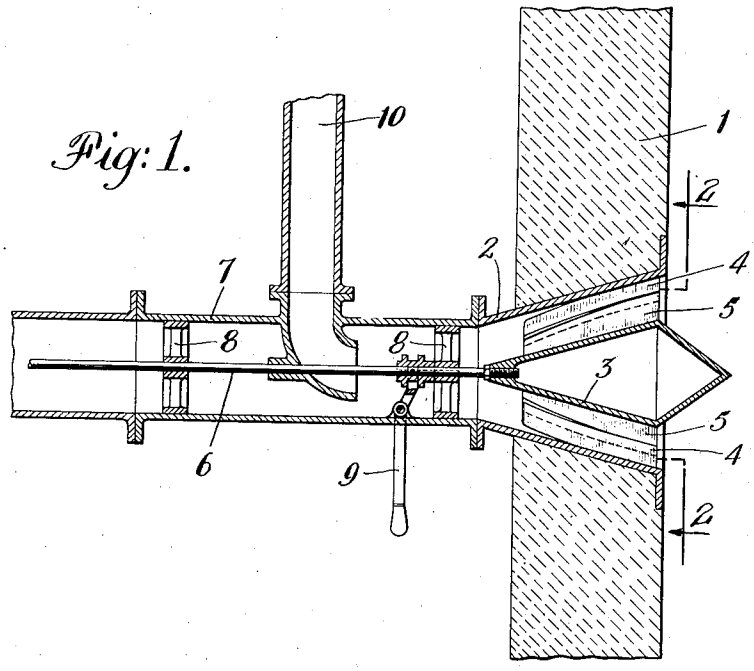
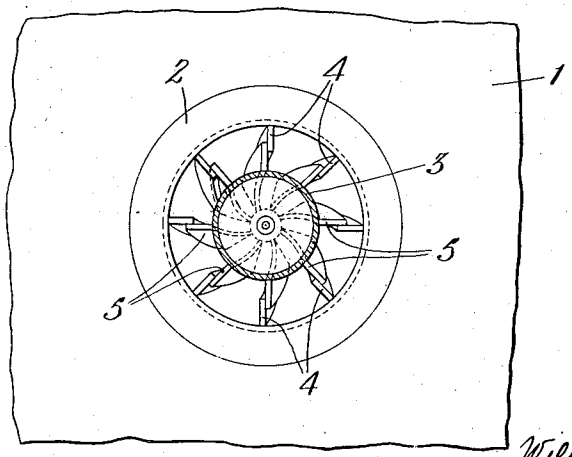


Fig: 2.



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PULVERIZED-FUEL BURNER.

Application filed February 1, 1926. Serial No. 85,098.

This invention relates to burners for pulverized fuel furnaces and particularly to that type of burner which is arranged to discharge the incoming stream of fuel and air in the shape of a spirally whirling hollow cone.

The principal object of the invention is to provide a burner of this type which can be adjusted so as to alter the discharge area and thereby prevent operational impairment during changes in furnace capacity.

Heretofore, in burners of this type, it has been impossible to maintain the proper swirling action at varying furnace capacities or a constant velocity at which the fuel enters the furnace. This difficulty has arisen because of the fact that the spiral blades necessary to impart the swirling action have not permitted any alteration or adjustment of the area of the discharge opening.

More specifically considered, therefore, it is the object of my invention to provide a burner of the character described with which it is possible to maintain a constant swirling action at various furnace capacities; to maintain a constant velocity at which the fuel enters; and to maintain a constant centrifugal force for spreading the particles of coal as they enter the furnace. I also provide a burner which will keep the coal in suspension even at low furnace capacities.

I attain the foregoing objects and others which may appear hereinafter or are incident to my invention by means of a construction which is illustrated in the preferred form in the accompanying drawing, wherein:

Fig. 1 is a vertical longitudinal section through my improved burner showing the adjacent pipe connections for the entry of pulverized fuel and air, and

Fig. 2 is a section on the line 2—2 of Fig. 1.

In the drawing the burner is shown extending thru the furnace wall 1. It comprises an outer shell 2 and an inner cone 3 which have their adjacent sides substantially parallel as shown with the outward flare toward the point of discharge into the furnace.

The outer shell is provided with spiral vanes 4 which project inwardly toward the cone and the cone itself is provided with similar vanes 5 projecting outwardly toward the vanes on the shell with which they cooperate to give the fuel a swirling action as it enters the furnace.

A rod 6 is connected to the rear end of the cone 3. This rod lies within the air conduit 7 in which it is supported by means of the spiders 8. Movement of the cone 3 axially of the burner is effected thru the medium of the rod 6 and the bell crank handle 9. The pulverized fuel is introduced thru the conduit 10.

By moving the cone to the left within the shell 2 it will be seen that the discharge area will be decreased and vice versa. During adjustment the spiral vanes will coact to rotate the cone since the vanes are arranged to overlap as clearly shown in Fig. 2. The vanes therefore, so to speak, are spirally telescopic.

By providing both the cone and shell with vanes which overlap true spiral channels are provided in all positions of adjustment of the burner by virtue of which effective swirling action is maintained under all operating conditions.

By means of the construction shown I am enabled to adjust the burner to meet different furnace capacities. When it is not desired to use the furnace at full capacity the burner opening, of course, should be smaller in order to correspond to the reduced amount of fuel. Heretofore, in burners of this type, it has not been possible to obtain effective swirling action, and, therefore, a constant centrifugal force for spreading the particles of coal as they enter the furnace was not obtained. Through the practice of my invention effective swirling action is maintained whereby the fuel is kept in suspension, with the result that fuel does not have a tendency to settle out at low capacities.

I claim:—

1. A pulverized fuel burner comprising in combination, a flaring shell, an inner cone mounted for rotation and arranged with sides paralleling the shell sides and axially movable to vary the discharge area between shell and cone, spiral vanes extending inwardly from the shell a portion of the dis-

tance to the cone, and similar vanes extending outwardly from the cone to cooperate with said first vanes in directing the fuel.

2. A pulverized fuel burner comprising in combination, a shell flaring outwardly toward the point of discharge, a rotatable and axially movable central cone-like member with sides substantially parallel to the shell sides, spiral vanes extending inwardly from the shell a portion of the distance to the cone, similar vanes extending outwardly from the cone to cooperate with said first vanes in directing the fuel, and means for axially varying the relation between shell and cone to alter the discharge area.

In testimony whereof, I have hereunto signed my name.

WILFRED R. WOOD.