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FLAME SHIELD

Filed May 18, 1929

Fig. 1.

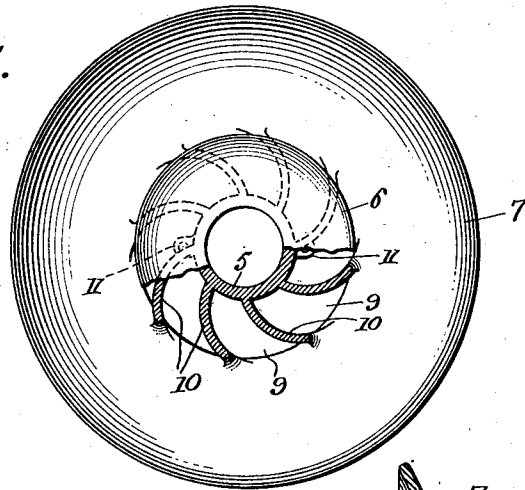


Fig. 2.

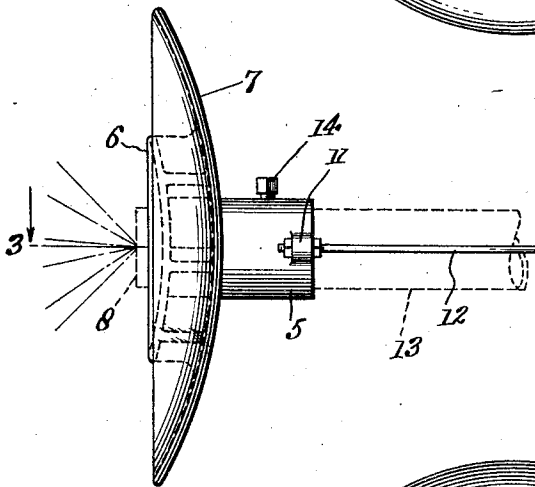


Fig. 3.

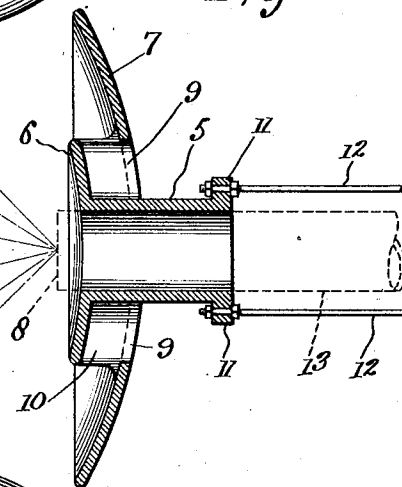
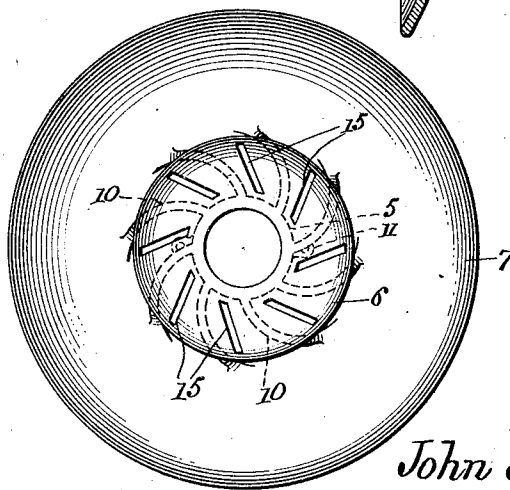


Fig. 4.



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FLAME SHIELD

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The present invention relates to improvements in flame shields, and more particularly to flame shields for use in connection with oil or gas burning apparatus.

5 An object of the invention is to provide an improved shield of light weight, low cost, durable construction and long life designed for use in connection with oil or gas burners and acting to protect the burner.

10 Another object of the invention is to provide an improved flame shield, which will be adjustable on the guide burner pipe for the purpose of increasing or decreasing the flame volume and temperature.

15 A further object of the invention is to provide an improved flame shield that will improve the combustion, render the operation of the burner substantially noiseless and produce a wide, whirling, soft flame, short in
20 length and with intense heat of combustible gases.

A still further object of the invention is to provide an improved flame shield in which the amount of soot usually found in boiler
25 tube areas is reduced to the minimum.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended
30 hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a front view, with parts broken
35 away, and parts shown in section, of an improved flame shield constructed in accordance with the present invention,

Figure 2 is an edge view of the same with parts of the burner and guide pipe indicated
40 in dotted lines,

Figure 3 is a central sectional view taken through the device with parts of the burner and guide pipe indicated in dotted lines, and

Figure 4 is a front elevation showing a
45 slight modification.

Referring more particularly to the drawings, 5 represents a sleeve or hub on one end of which is a small shield disc 6 and spaced rearwardly, with reference to the burner, is a
50 second shield disc 7 of larger diameter.

Preferably both discs are dished with their concave sides facing the burner which is indicated at 8. Air openings 9 are made in the large disc 7 adjacent the hub 5 and such openings communicate with the space be-
55 tween the discs 6 and 7. This space is occupied by vanes 10, which as shown in Figure 1, are preferably curved to impart a whirling motion to the incoming air. The vanes preferably are of the same depth as the inner disc
60 6 and they are open at their upper ends. The hub 5 extends outwardly beyond the large disc 7 and is provided with perforated lugs 11 to receive the adjusting rods 12.

The hub 5 is mounted upon the burner pipe
65 13, which acts as a guide pipe.

In the use of the device, the air enters from the outer surface or convex side of the large shield disc 7, passing through the openings 9
70 and into the space between the curved vanes 10 and thence outwardly along the curved side walls of the vanes 10 and against the inner concave surface of the disc 7 which extends outwardly beyond the ends of the vanes
75 10 and the edge of the smaller disc 6. The vanes 10 may be set at an angle of seventy degrees which has been found to give good results.

The incoming air mixes with the fuel at a point comparatively close to the atomizer
80 8 where ignition takes place, combustion being supported and completed by the air passing around the outside of the shield.

Consequently there is produced in the fire
85 box a wide, whirling, soft flame, substantially noiseless, short in length, and with intense heat of combustible gases. The flame may be increased or decreased by moving the shield unit inward or outward at the discretion of the operator, who has the adjustment under
90 easy control through the use of the rods 12. If no adjustment is required, the unit may be firmly fixed to the guide pipe 13, as by the use of the set screw 14, shown in Figure 2.

By the use of the improved flame shield, the
95 percentage of soot usually found in boiler tube areas, where other types of shields have been employed, is reduced to a minimum and this indicates that a substantially complete combustion has been effected.

As shown in Figure 4 the inclined diagonal slots 15 are made in the front shield disc 6 where the device is used with gas. It will be noted that the slots 15 are preferably located between adjacent vanes 10. These slots will permit a certain restricted proportion of the air to be drawn directly to the burner through the front disc. Such air will be in narrow sheets presented edgewise and at an inclination to the burner.

The arrangement of the device is such as to allow a complete mixture of air at substantially right angles to the oil spray in the hollow cone shape from the burner atomizer. The devices may be manufactured in different sizes to suit various conditions of use and they are intended to overcome well known objectionable features encountered in present forms of flame cones or shields such for instance as the items of noise, expense, proper and complete combustion.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

What is claimed is:—

1. An improved flame shield comprising a small disc, a large disc spaced axially from the small disc and having openings therein communicating with the atmosphere and with the space between the discs, and transverse vanes extending between the axially spaced discs and across said space between the discs.

2. An improved flame shield comprising, in combination with a burner and a burner pipe, a hub slidably mounted on said burner pipe, means to adjust said hub on the burner pipe toward and from the burner, a small disc of concavo-convex form on the inner end of said hub, a second disc of concavo-convex form on the hub spaced from the first mentioned disc and being of greater diameter than said first named disc and having air receiving openings adjoining the hub, and transversely extending curved vanes spaced apart and extending between said discs and being open at their outer ends.

3. An improved flame shield comprising a hub, discs of unequal diameters spaced along the axis of the hub, and vanes between said discs having spaces therebetween and between the discs opening radially outward and in communication with a source of air supply.

4. In combination a burner having a combustion space and an improved flame shield comprising a pair of dished discs axially spaced apart, and vanes between said discs and having spaces therebetween in communication with the atmosphere at their inner portions and with the combustion space of said burner at their outer portions.

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