

Aug. 1, 1961

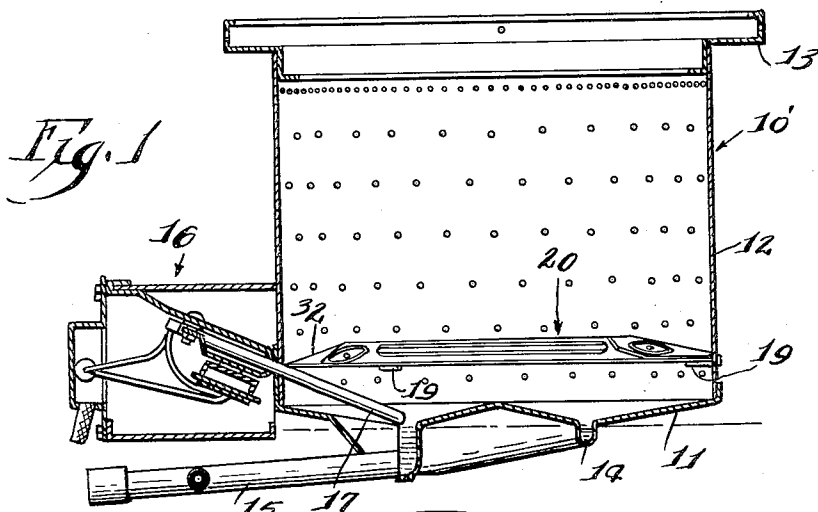
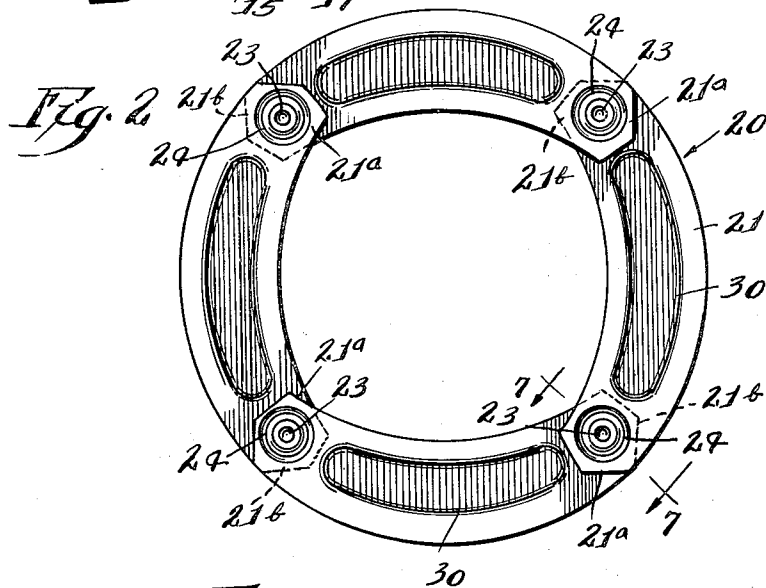
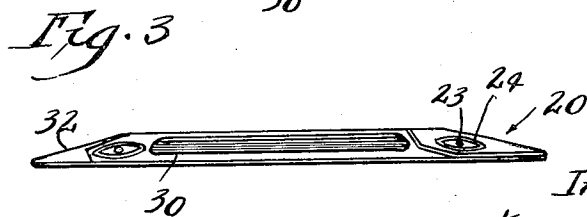
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2,994,368

FIRE RING

Filed Aug. 4, 1959

2 Sheets-Sheet 1



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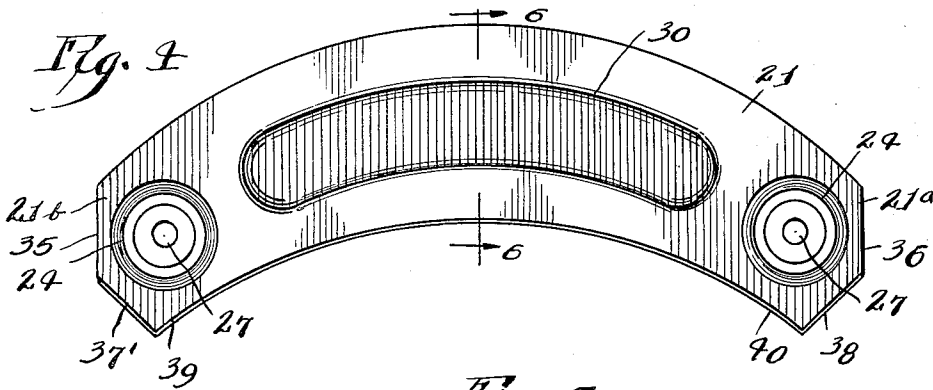
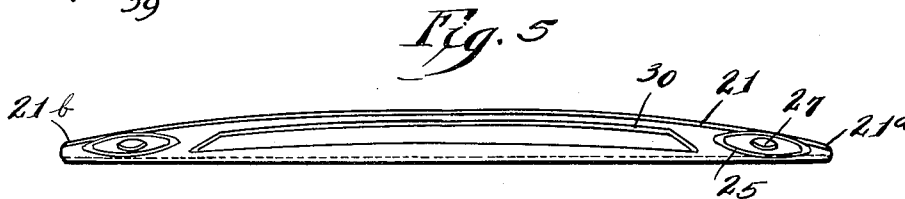
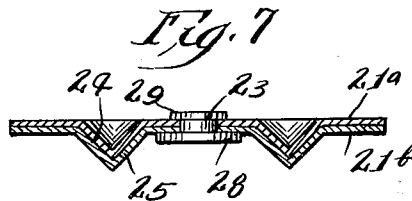
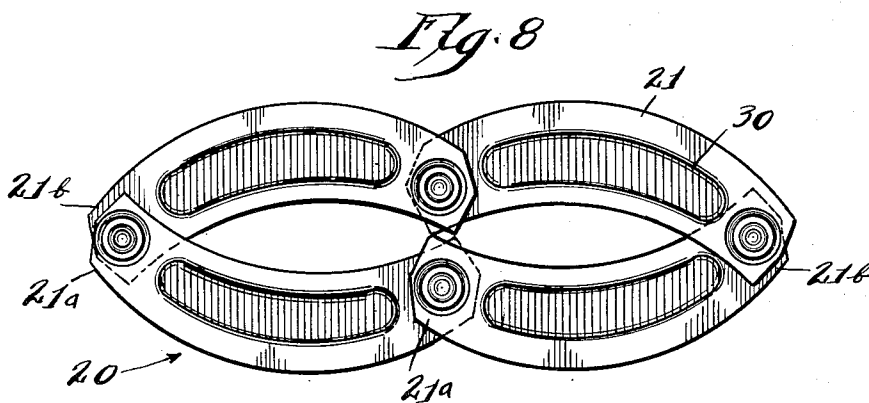
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2,994,368

FIRE RING

Filed Aug. 4, 1959

2 Sheets-Sheet 2



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2,994,368
FIRE RING

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Filed Aug. 4, 1959, Ser. No. 831,655
5 Claims. (Cl. 158—91)

This invention relates to an annular baffle or fire ring for use in pot type burner apparatus.

It is a general object of the invention to provide a new and improved fire ring of the type described.

In pot type burners, of which there are now several well-known forms, a burner pot of generally cylindrical shape is usually utilized and this is provided with a liquid fuel inlet at the bottom for admitting fuel oil or the like in liquid form for vaporization and mixture with air for combustion. In pots of this type, combustion may occur at any of several levels within the pot varying from a low position adjacent the bottom of the pot to a high position adjacent the upper rim of the pot depending upon the heat of the burner, the rate of fuel supply and the rate of air flow. Some burners are operated according to an "on-off" mode wherein the fire is extinguished when there is no call for heat and is reignited when there is a need for heat, while other burners are operated according to a so-called "high-low" manner wherein the fire is merely lowered to a pilot fire or low fire state when there is no call for heat and is increased when there is a demand for heat. According to either mode of operation, and particularly with "high-low" burner operation, there may be utilized one or more annular baffles or fire rings positionable within the pot either at a low position for maintaining suitable conditions for low fire operation (in which case the ring may be called a low fire ring) or at a higher position within the pot for high fire operation (in which case the ring may be called a high fire ring).

Whenever such annular baffles or fire rings are utilized, they usually take the form of an annular ring having a substantial radial width and sometimes a frusto-conic inclination upwardly and inwardly. The outer diameter of such a ring is usually about equal to the inner diameter of the burner pot, and with such dimensions and construction, there usually occurs no great difficulty in positioning the ring in the pot or removing it from the pot. But difficulty frequently is encountered during assembly, maintenance or repair on inserting or removing the annular baffle through a door or other opening provided in the outer burner housing to permit access to the burner interior. This occurs due to the fact that the baffles or fire rings may frequently be of a diameter between 8 and 12 inches while the housing doors or openings may be of considerably smaller dimensions.

With the above in mind, it is a more specific object of the present invention to provide a new and improved baffle or fire ring for a pot type burner which is expandable to an annular shape to fit the burner pot with which it is intended to be utilized to thereby enable its use as a low fire or high fire ring and which is collapsible in order to facilitate insertion and removal of the baffle with reference to the remainder of the burner apparatus.

Another object is to provide a new and improved baffle of the type described comprised of a plurality of arcuately shaped segments pivotally connected together end to end and movable relative to each other from a substantially annular shape to a generally oval shape.

A further object is to provide a new and improved collapsible baffle of the type described having a substantially frusto-conic upward and inward inclination.

It is also an object of the invention to provide a new

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and improved baffle of the type described which is comprised of a series of arcuately shaped segments pivotally connected together end to end wherein the segments each comprise a somewhat kidney-shaped or bean shaped plate of thin metal which may be stamped or cut, thereby facilitating the formation of individual segments successively from a continuous sheet of metal having a width substantially equal the length of the segments in a manner to avoid excessive waste of materials.

Other objects and advantages will become readily apparent from the following detailed description taken in connection with the accompanying drawings, in which:

FIG. 1 is a vertical sectional view taken through the center of a burner pot utilizing a low fire ring constructed according to the principles of the present invention;

FIG. 2 is an enlarged top plan view of a fire ring as shown in FIG. 1;

FIG. 3 is an elevational view of the ring shown in FIG. 2;

FIG. 4 is an enlarged top plan view of one of the segments used in making the collapsible ring shown in FIGS. 1, 2 and 3;

FIG. 5 is a front elevational view of the segment shown in FIG. 4;

FIG. 6 is an enlarged sectional view taken at about the line 6—6 of FIG. 4;

FIG. 7 is an enlarged sectional view taken at about the line 7—7 of FIG. 2; and

FIG. 8 is a plan view showing a ring such as that of FIGS. 1, 2 and 3 in a collapsed somewhat oval shape facilitating insertion and removal of the ring relative to the burner apparatus.

While an illustrative embodiment of the invention is shown in the drawings and will be described in detail herein, the invention is susceptible of embodiment in many different forms, and it should be understood that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claims.

Referring now to the drawings in more detail, a pot type burner apparatus of the type referred to may include among other structures a burner pot such as that illustrated at 10 in FIG. 1, including a bottom wall as at 11, a cylindrical side wall as at 12 and a rim as at 13. The burner pot may be supported in any suitable manner, and the bottom wall may include a concentric annular depression or groove as at 14 which forms a fuel well and which is provided with an inlet suitably connected with the fuel supply pipe as at 15. In the form illustrated in FIG. 1, an electrical ignition apparatus 16 is provided, and this includes an igniter element 17 which projects through the burner pot side wall into the pot interior immediately above the annular fuel well 14 for the purpose of initiating burner operation. Pots of this type may include one or more radially inwardly projecting pins as at 19 suitably mounted in the burner pot side wall and providing a support for an annular baffle or fire ring generally designated by the reference number 20. As illustrated in FIG. 1, the fire ring is positioned to facilitate the maintenance of a low fire or pilot fire, but it will be understood that the ring could be positioned higher in the pot and thus might be described as a high fire ring under such circumstances.

The ring 20 is constructed according to the principles of the present invention, and as seen in FIGS. 2 and 8 it includes a plurality of segments 21 which may be described as arcuately shaped, kidney shaped, or bean shaped. In a preferred embodiment illustrated, four of

the segments 21 are arranged end to end with adjacent end portions overlapping. As illustrated, progressing counterclockwise around the ring as shown in FIG. 2, trailing end portions 21a of the segments are overlying and leading end portions 21b are underlying. Passing through each pair of overlapping end portions 21a and 21b, a rivet 23 pivotally interconnects the segments to permit movement of each relative to the other.

To provide interengaging bearing surfaces and to facilitate free pivotal movement of the segments relative to each other, each of the end portions 21a and 21b is deformed concentrically about the rivet 23 to provide an annular upwardly facing depression as at 24 and coincident to the depression 24 a downwardly extending annular projection as at 25. The deformation 24, 25 is concentric with the rivet 23 and an opening 27 provided in each segment end portion for receiving the rivets. The rivets 23 are each provided with a head as at 28 and are deformed as at 29 so that the segments 21 are more or less permanently connected together. With this arrangement, it will be understood that the downward annular projection 25 on the overlying end portion 21a is nested in the upwardly facing annular depression 24 in the underlying end portion 21b to thereby provide interengaging bearing surfaces which facilitate pivotal movement of the segments about the axis of the rivets. The deformations 24, 25 also serve to strengthen the end portions of the segments.

In order to strengthen the midportions of the segments, each is provided with an elongate arcuate deformation in the form of an upwardly facing depression as at 30.

While it is intended that the invention will encompass a construction wherein the fire ring 20 and each of the segments 21 are substantially flat and planar except for the deformations 24, 25, 30, in the preferred form each of the segments 21 and the composite ring 20 is shaped with an upward and inward frusto-conic inclination as fire rings of this shape have been found to facilitate the maintenance of desired conditions in the burner in some cases. This inclination in the composite baffle 20 is readily visible in FIGS. 1 and 3 on viewing the surface designated by the numeral 32 and is understandable in connection with each of the individual segments on viewing FIG. 5. In FIG. 5, at the upper center, the height of the individual segment 21 is greatest due in part to the slightly greater width of the segment at the center than at the end portions.

In order to facilitate collapse of the conic baffle, in the preferred embodiment it includes four segments 21 which are similar in size and shape, but it will be understood that there could be a greater number of segments and that these may or may not all be identical in size and shape. Referring to FIGS. 2 and 8, it will be appreciated that upon grasping the annular baffle as shown in FIG. 2 and applying radially inward lateral pressure to any two opposed pivots, these pivots are movable toward each other while the other two pivots move away from each other and that the baffle, even though conic, may be collapsed to a position substantially as shown in FIG. 8. In the preferred arrangement, the collapsed shape is somewhat elliptical, but it will be appreciated that with other numbers of segments, the collapsed shape may be something other than elliptical and may possibly be egg shaped or irregularly shaped. Accordingly, the term "oval shaped" is used herein to designate any non-circular or non-annular collapsed shape of the baffle.

The individual segments 21 are preferably made from thin sheet metal, and this facilitates manufacture of the segments by stamping or cutting the same from a continuous sheet of metal having a width about equal the length of the individual segments between the edges 35 and 36 (FIG. 4). This facilitates the cutting of successive segments from a continuous strip of metal without

substantial waste material. Negligible waste may occur by removing triangular segments at opposite ends, leaving the edges 37 and 38 and by reducing the width of the segments at opposite ends by removing narrow pie-shaped portions leaving the end edges 39 and 40. Preferably, the segments are made in two simple operations, a first stamping out the segments and punching rivet holes 27, and a second shaping the segments to include the deformations 24, 25, 30 and a frusto-conic inclination.

We claim:

1. A collapsible fire ring for pot type burners, comprising, a plurality of generally arcuately-shaped plates in excess of three arranged end to end in a continuous ring generally in a common plane, means connecting adjacent ends together for relative pivotal movement generally in said plane, said segments being movable relative to each other to a generally oval shape facilitating insertion and removal of the ring through a burner door or opening of a size less than the outer diameter of the ring when annular shaped.

2. A collapsible fire ring for pot type burners, comprising, a plurality of kidney-shaped platelike annulus segments in excess of three each being relatively thin and having a substantial radial width, said segments being arranged end to end in a continuous ring generally in a common plane with adjacent ends overlapping to form a substantially annular baffle, and means pivotally interconnecting each pair of overlapped ends enabling movement of the segments relative to each other about axes transverse to said plane to a generally oval shape.

3. A collapsible fire ring for pot type burners, comprising, a plurality of at least four arcuate platelike segments arranged end to end with adjacent ends overlapping to form a continuous substantially annular baffle, a pin passing through and pivotally interconnecting each pair of overlapped ends, and each pair of overlapped ends having a circular indentation on one end concentric around the pivot pin and a mating circular projection on the other end nested in the indentation, thereby to facilitate pivotal movement of the segments relative to each other to form a substantially annular shape wherein the ring is positionable in a burner pot or a generally oval shape enabling insertion of the ring through an opening smaller than the outer diameter of the ring when annular shaped.

4. A collapsible fire ring for pot type burners, comprising, a plurality of arcuate platelike segments disposed generally horizontally and arranged end to end in a continuous substantially annular shape, each segment having an inward and upward frusto-conic inclination and providing an arcuate segment of a truncated cone thereby to form an annular substantially frusto-conical baffle positionable in a cylindrical burner pot, and means pivotally interconnecting adjacent ends enabling generally horizontal pivotal movement of each segment relative to each other to a generally oval shape.

5. A collapsible low fire ring for pot type burners, comprising, a plurality of kidney shaped plate-like segments in excess of three arranged end to end with adjacent ends overlapping to form a continuous substantially annular shape, each segment having a frusto-conic inclination and providing an arcuate segment of a truncated conic surface thereby to form an annular substantially frusto-conic baffle, a rivet passing through and pivotally interconnecting each pair of overlapped ends, and each pair of overlapped ends having a circular indentation in one segment end concentric around the rivet and a mating circular projection on the other segment end nested in the indentation, thereby to facilitate pivotal movement of the segments relative to each other from a substantially annular shape wherein the ring is positionable in a burner pot to a generally oval shape enabling insertion of the ring through a burner opening

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smaller than the outer diameter of the ring when annular shaped.

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