Oct. 27, 1964 H. W. LEACH ETAL 3,154,131

LIQUID FUEL BURNING APPARATUS

Filed April 2, 1962 2 Sheets-Sheet 1

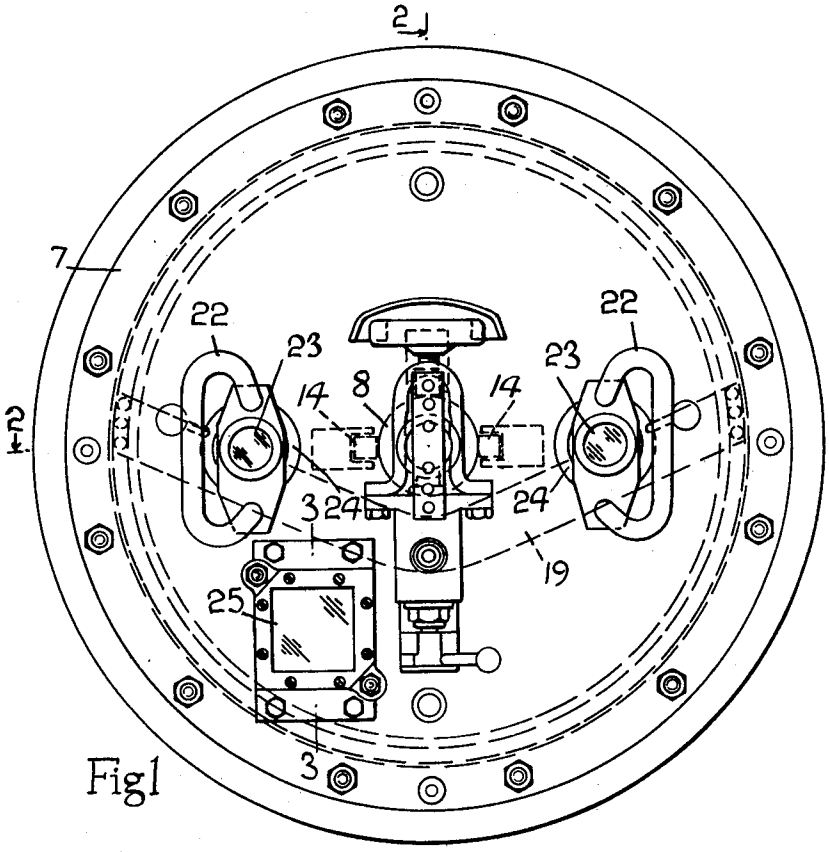


Fig1

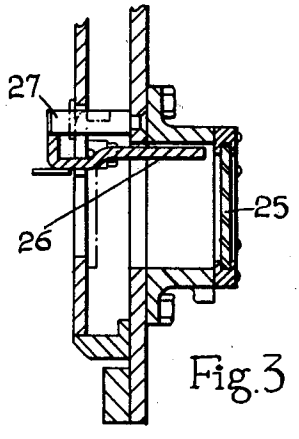


Fig.3

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LIQUID FUEL BURNING APPARATUS

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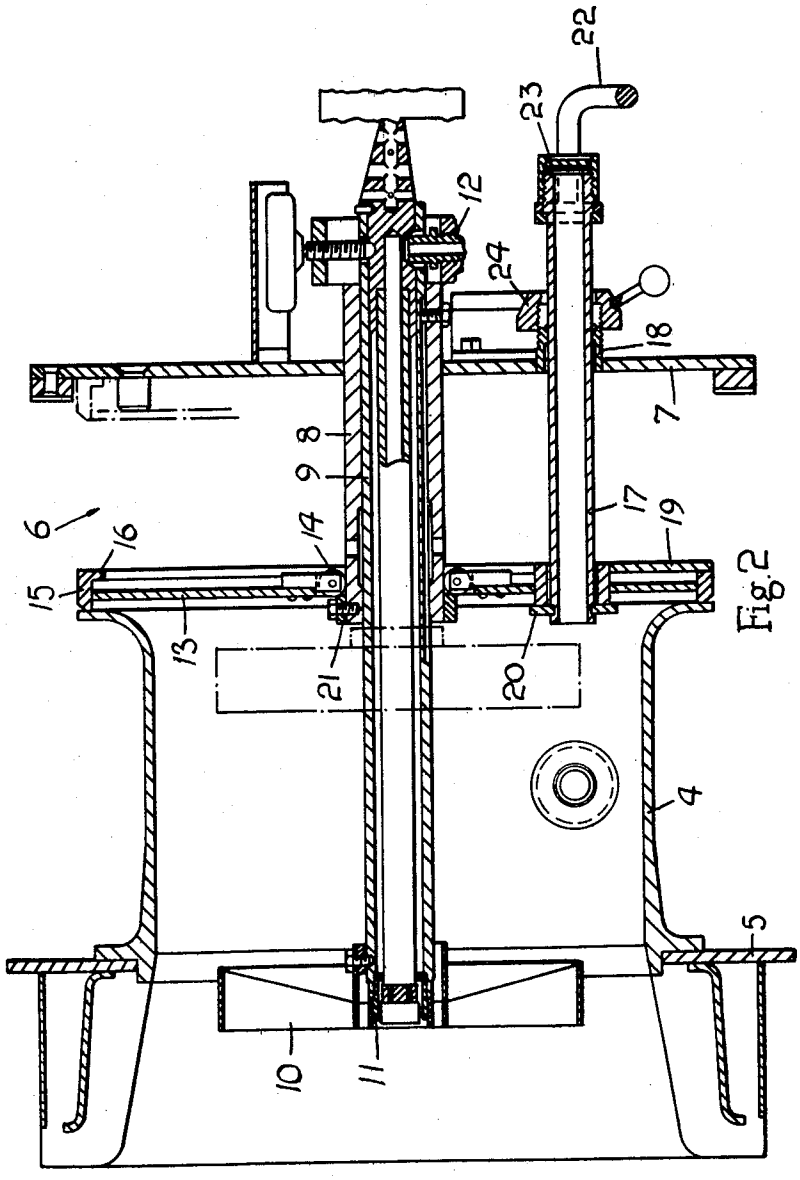


Fig. 2

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3,154,131

LIQUID FUEL BURNING APPARATUS

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This invention relates to liquid fuel burning apparatus of the kind comprising a cylindrical casing adapted at its inner end for attachment to a furnace, steam generating plant, or the like, an air chest surrounding the casing and having an outer wall which is spaced from the outer end of the casing to define an air inlet therebetween, a burner tube extending through said outer wall, said burner tube being movable axially between operative and inoperative positions, and means for controlling the admission of air through said inlet.

The object of the present invention is to provide such apparatus in a convenient form.

According to the invention the means for controlling the admission of air through said inlet comprises in combination an annular disc surrounding and movable axially on a relatively fixed tube through which the burner tube extends, an annular ring closely surrounding the periphery of the disc and permitted limited axial movement relative thereto, said ring being adapted to seat against the outer end of the casing, and means for moving the ring in an axial direction between the casing and the outer wall of the air chest, the arrangement being such that the initial movement of the ring away from its seating on the casing can be effected without imparting movement to the disc.

In the accompanying drawings FIGURE 1 is an end view illustrating one example of the invention, while FIGURES 2 and 3 respectively are sections on the lines 2—2, 3—3 in FIGURE 1.

Referring to the drawings there is provided a cylindrical casing **4** which at its inner end is connected to an inlet **5** in the front wall of a furnace, steam generating plant, or the like. The outer end of the casing **4** is splayed to extend at right angles to the axis of the casing. Moreover, surrounding the casing is an air chest having an outer wall which is spaced from the outer end of the casing to define therebetween an air inlet **6**.

The air chest (only part of which is shown) may be common to a plurality of apparatus in accordance with the invention, in which case it surrounds a plurality of casings, but preferably the part of the outer wall of the air chest opposite the, or each, casing, is formed as shown as a separate detachable plate **7**. In this plate **7** is secured a tube **8** which is axially aligned with the casing **4**, whilst through the fixed tube extends a burner tube **9** carrying a swirler **10** surrounding the burner nozzle **11**. The burner tube **9** can be moved axially between an operative position, shown in full lines in FIGURE 2, in which the swirler **10** and nozzle **11** are located within the inlet **5**, and an inoperative position shown in broken lines in FIGURE 2 in which the swirler **10** and nozzle **11** are located within the outer end of the casing **4**. Furthermore, the outer end of the burner tube **9** at the outer side of the plate **7** is connected to a fuel supply pipe **12** by means which will permit of its disconnection only when the burner is in the inoperative position.

Surrounding the tube **8** is an axially movable and annular valve disc **13** carrying rollers **14** adapted to ride on the periphery of the tube **8**. The disc **13** is closely surrounded by a short cylindrical ring **15** having an internal flange **16** at its outer end adapted to engage the disc **13**. The ring **15** is permitted limited axial movement relative to the disc **13** whilst still surrounding the latter, and is movable axially between a position shown in full lines in FIGURE 2 (hereinafter termed the closed position) in which it bears against the outer end of the casing **4**, and a fully open position (shown in broken lines in FIGURE 2) in which it bears against the inner side of the plate **7**.

For moving the ring **15** axially there are provided a pair of tubular spindles **17** which are axially movable within bushes **18** secured in the plate **7**. The spindles **17** are secured to a yoke **19** which is secured to the ring **15**, whilst their inner ends extend through holes in the disc **13**, and are provided with collars or other abutments **20** which limit the relative movement between the ring **15** and disc **13** in one direction. The arrangement is such that when the ring **15** is in the closed position, the disc **13** is spaced from the abutments **20** and is urged against an abutment collar **21** on the fixed tube by pressure in the air chest. Thus the initial movement of the spindles **17** in a direction to move the ring **15** to the open position will not impart movement to the disc **13**, but will merely open an annular gap between the ring **15** and the outer end of the casing **4** to break the initial air seal. This feature enables the ready opening of the air inlet even when the difference in pressure between the air chest and the combustion chamber is considerable.

The outer end of each spindle **17** is provided with a handle **22** which is offset relative to the axis of the spindle so that the combustion space can be viewed through a transparent or translucent window **23** at the outer end of the spindle **17**. Moreover, the window **23** of one or both spindles **17** is detachable to admit the insertion of an ignition torch through the spindle, a pair of pins (not shown) being provided in the handle **22** to actuate a valve and an electric circuit of the torch respectively.

The bushes **18** in the plate **7** are externally screw-threaded at the outer side of the plate **7**, and engaged therewith are screw-threaded collars **24** whereby the spindles **17** can be clamped at any desired axial setting.

In addition to the windows on the spindles **17**, a further window **25** may be provided in the plate. This window is aligned with an aperture in the disc **13** which is normally closed by a pivoted shutter **26**. The shutter **26**, however, can be opened by manually operated means, or, as shown, automatically by a projection **27** on the plate **7** when the ring **15** is moved to the fully open position so as to provide an unobstructed view of the furnace or like chamber.

Having thus described our invention what we claim as new and desire to secure by Letters Patent is:

1. Liquid fuel burning apparatus for connection to a combustion chamber, comprising a cylindrical casing, an air chest surrounding said casing and having an outer wall spaced from the outer end of the casing to define an air inlet therebetween, a fixed tube secured to said outer wall and extending to a position adjacent said outer end of the casing, a burner tube slidably mounted in said fixed tube and extending therefrom axially through the casing, means for moving the burner tube axially within the fixed tube between an operative position and an inoperative position, an annular disc surrounding said fixed tube and axially slidable on the exterior thereof, a spindle, means mounting said spindle on said outer wall for sliding movement in a direction parallel to said fixed tube, the inner end of said spindle extending through a hole in the annular disc, an abutment at the inner end of the spindle, said abutment engaging the disc when the abutment is moved towards the outer wall so as to move the disc towards the outer wall, an annular ring closely surrounding the periphery of the disc, means securing said ring to the spindle, an inwardly directed flange at the edge of the

ring engageable with said disc to move the disc towards the casing when the ring is moved towards the casing by means of the spindle, movement of said spindle towards the casing being halted by said ring engaging the casing and forming with the disc an air-tight seal between the interior of the casing and the air chest, and a stop on the fixed tube limiting movement of the disc towards the casing to a position in which the disc is spaced from said abutment, whereby movement of the spindle away from the casing serves to move the ring to break said air seal before the disc is moved.

2. Liquid fuel burning apparatus as claimed in claim 1 in which said spindle is hollow, the end of the spindle remote from the casing being provided with a handle which is offset relative to the axis of the spindle whereby the casing can be viewed through the spindle.

3. Liquid fuel burning apparatus as claimed in claim 1 including means for clamping the spindle at any desired axial setting.

4. Liquid fuel burning apparatus as claimed in claim 1 including an aperture in said disc, a pivotal shutter closing said aperture, a window in said outer wall in alignment with the aperture, and a projection on said outer wall engageable with the shutter to open the aperture when the disc is moved towards said outer wall.

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