Aug. 8, 1944. S. PERRY 2,355,466

BURNER OBSERVATION MEANS FOR HEATERS

Filed Jan. 18, 1941 3 Sheets-Sheet 1

Fig. 1

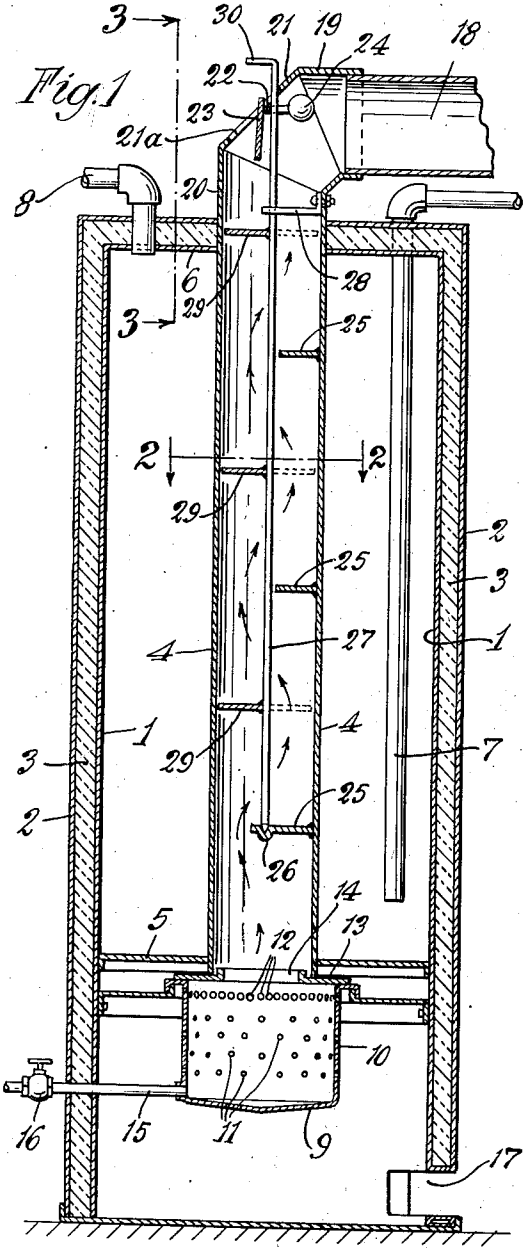


Fig. 4

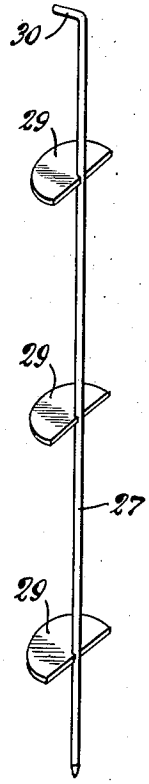


Fig. 5

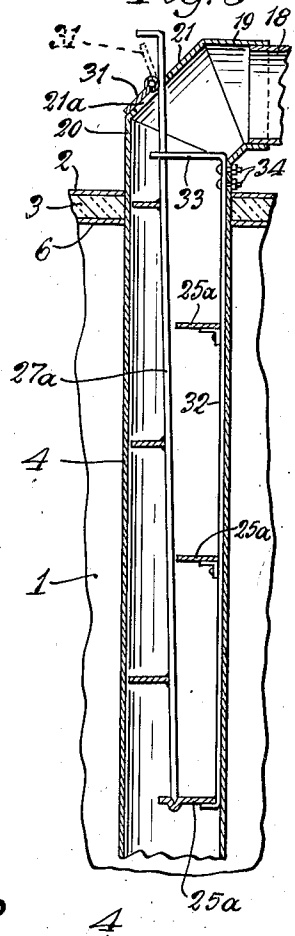


Fig. 3

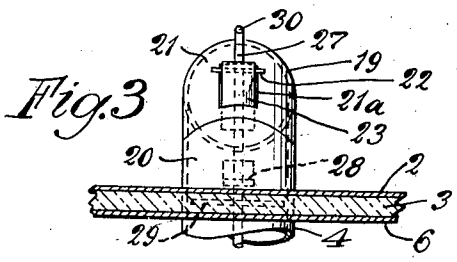
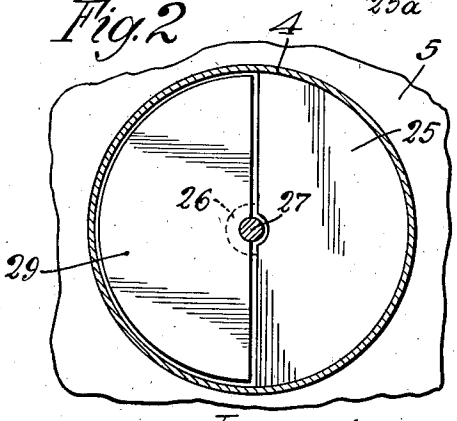


Fig. 2



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BURNER OBSERVATION MEANS FOR HEATERS

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Fig. 6

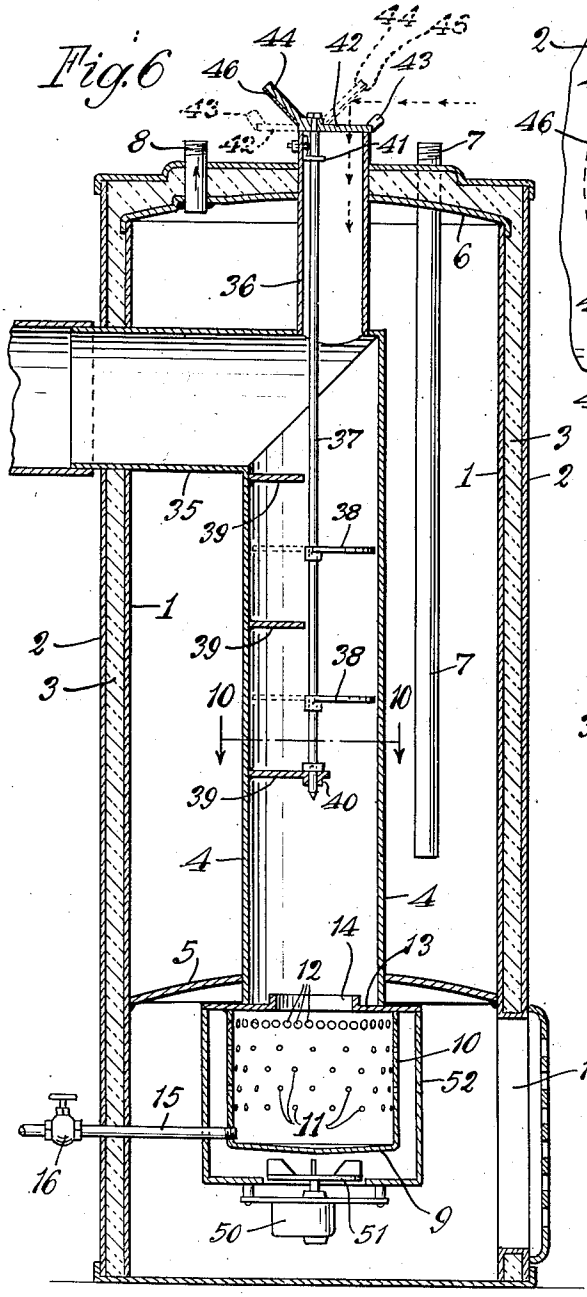


Fig. 7

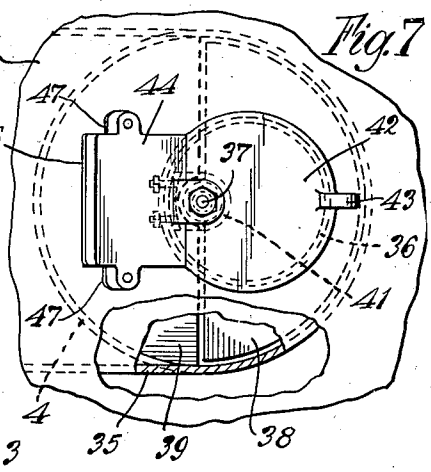


Fig. 8

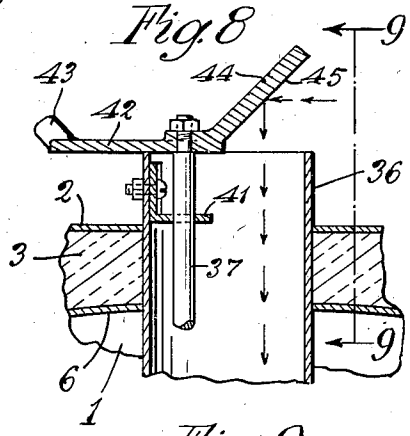


Fig. 9

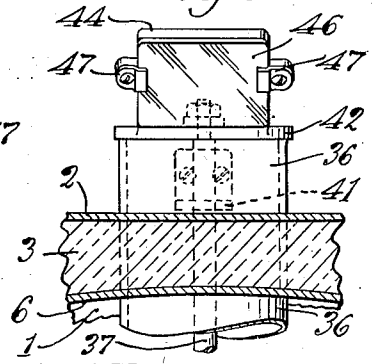
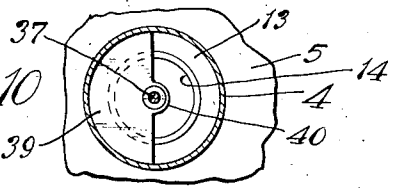


Fig. 10



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BURNER OBSERVATION MEANS FOR HEATERS

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Fig. 11

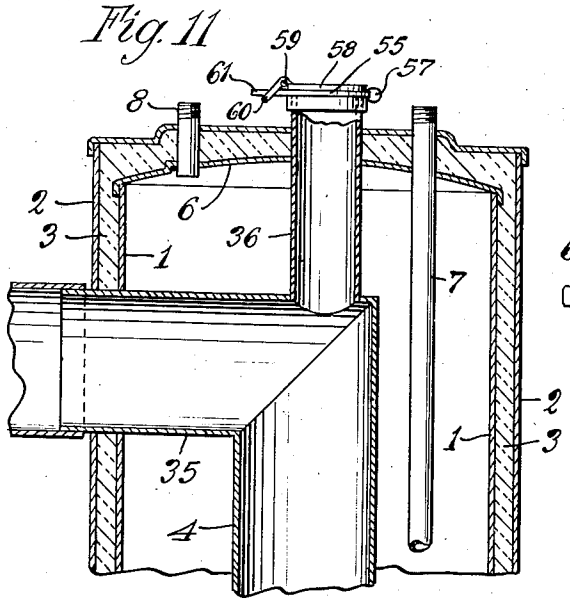


Fig. 15

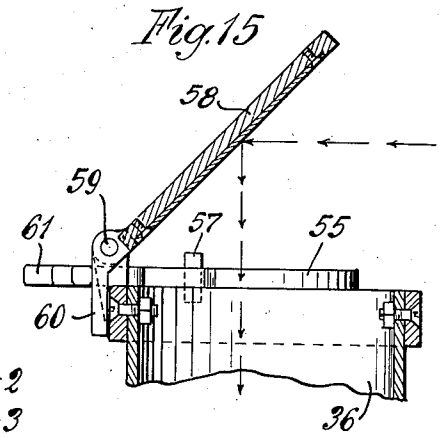


Fig. 14

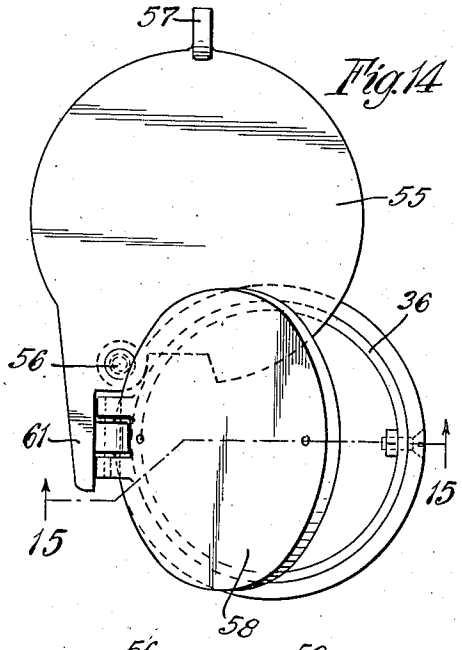


Fig. 12

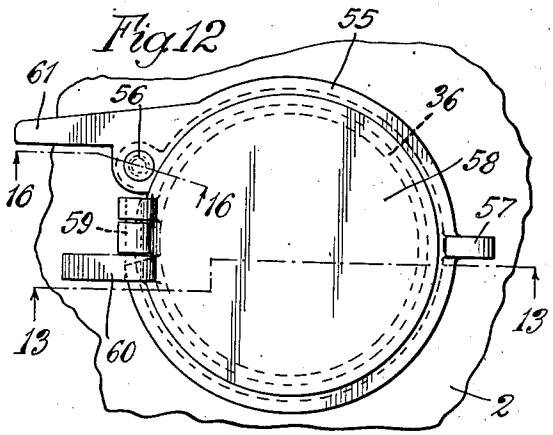


Fig. 13

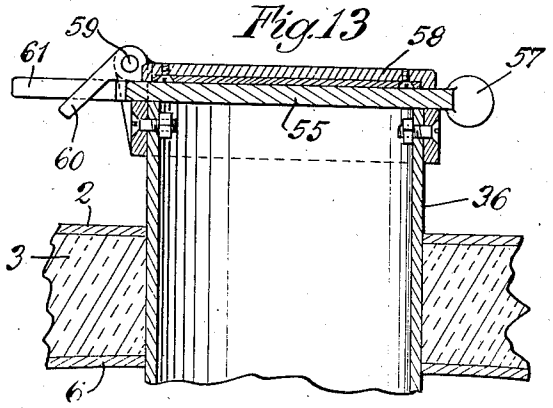
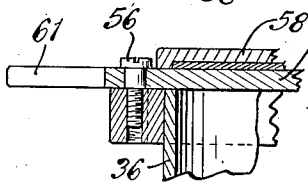


Fig. 16



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UNITED STATES PATENT OFFICE

2,355,466

BURNER OBSERVATION MEANS FOR HEATERS

Stanley Perry, Chicago, Ill., assignor to Oil Devices, Santa Fe, N. Mex., a limited partnership of Illinois

Application January 18, 1941, Serial No. 375,082

12 Claims. (Cl. 126—361)

My invention relates to an improvement in heaters and is for example particularly adapted to hot water heaters in which a pot type burner is employed having a generally vertical heating and flue passage above the burner.

One purpose is the provision of such a mechanism in which the user may inspect conditions within the burner through such a passage for example by looking down through the top of the heater, and to provide improved baffle means for such a heater, which may be adjusted to vary the baffling effect and which may also be moved when necessary to permit inspection from above of conditions within the burner.

Another purpose is the provision of improved inspection means for such a heater which may for example include a mirror whereby the observer may look laterally at the mirror, at or adjacent the level of the top of the heater, and may by means of the mirror look down into the pot to inspect conditions therein.

Another purpose is the provision of such a mirror and inspection device associated with adjustable or movable baffle means for the vertical passage.

Other purposes will appear from time to time in the course of the specification and claims.

I illustrate my invention more or less diagrammatically in the accompanying drawings wherein:

Fig. 1 is a vertical axial section;

Fig. 2 is a section on an enlarged scale on the line 2—2 of Fig. 1;

Fig. 3 is a section on the line 3—3 of Fig. 1;

Fig. 4 is a detail of part of the baffle structure;

Fig. 5 is a partial section similar to Fig. 1, illustrating a variation of the device;

Fig. 6 is a vertical axial section through a variant form of the device;

Fig. 7 is a partial plan view, on an enlarged scale, with parts broken away;

Fig. 8 is an enlarged section of the upper structure of Fig. 6, with parts in a different position;

Fig. 9 is a section on the line 9—9 of Fig. 8;

Fig. 10 is a section on the line 10—10 of Fig. 6;

Fig. 11 is a partial vertical axial section illustrating a variant form of the device;

Fig. 12 is a plan view on an enlarged scale;

Fig. 13 is a section on the line 13—13 of Fig. 12;

Fig. 14 is a partial plan view similar to Fig. 12, illustrating the parts in a different position;

Fig. 15 is a section on the line 15—15 of Fig. 14; and

Fig. 16 is a section on the line 16—16 of Fig. 12.

Like parts are indicated by like symbols throughout the specification and drawings.

Referring first to the form of Figs. 1 to 4, I illustrate a hot water heater having a generally cylindrical tank 1 and an outer jacket 2, the space therebetween being filled with any suitable insulation 3 if desired. 4 is a central generally cylindrical passage. 5 is a bottom member or head connecting the members 1 and 4, and 6 is a similar top member or head, the heads 5 and 6 forming with the outer cylinder 1 and the inner cylinder 4 a water container, which may have any suitable water inlet 7 extending from any suitable source of water supply. 8 is a water outlet for the hot water.

Aligned with the central cylindrical passage 4 is a pot type burner 9 having a side wall 10, having therein a plurality of air inlet apertures 11, herein shown as located at various levels, and a top row of secondary apertures 12. The pot is partially closed, for example by any suitable fire ring 13, having a central aperture 14, herein shown as in direct communication with the bottom of the cylinder 4. It will be understood that, whereas the pot type burner is shown as abutting directly against the bottom of the central cylinder or passage 4, it need not be so disposed. It may, for example, be spaced downwardly therefrom, with any suitable intermediate heating chamber or passage.

15 indicates a fuel inlet passage controlled by and suitable valve 16 and extending to any suitable supply of liquid fuel not herein shown. Any suitable means may be employed for admitting air to the space about the pot 9. I may, for example, employ one or more air inlet passages 17. It will be understood also that any suitable gate or opening not herein shown may be employed for giving access to the pot 9 and for inserting or removing it.

18 is any suitable flue, which in the form of Fig. 1 is shown as connected by an elbow 19 with an upper extension 20 of the central passage member 4. The elbow 19 may include an inclined wall portion 21, with an aperture 21a, in which is hinged as at 22 any suitable shutter 23, which may have an adjustable counterweight 24 and which is normally closed, but which may be thrust or moved open to permit inspection of conditions within the pot 9. It will also be understood that, if desired, it may be made wholly or partially transparent to permit inspection without movement.

I indicate at 25 a plurality of fixed baffles, each of which may constitute segments of the disc of in the neighborhood of 180 degrees. The bottom baffle 25 may have a bearing 26 to receive the lower end of a rotatable shaft 27, the upper end of which may be rotatably mounted in any suitable upper bracket 28. The rod 27 carries a plurality of baffle members 29, which may also be in the form of disc segments of 180 degrees. The upper end of the rod 27 may extend outwardly through the elbow 19 and may have an exterior manipulating handle 30. It

will be understood that when maximum baffling is desired, the rod 27 may be located as shown in Fig. 1, in which case the baffles 29 provide with the baffles 25 a staggered series of baffles, which constrain the heated products of combustion to a tortuous path upwardly along the central passage 4.

In the form of Fig. 5 the rod 27*a* may be inclined or offset, as shown, in such fashion as to move by gravity into the closed position. 31 illustrates any suitable hinged inspection door. The fixed baffle members 25*a* may be mounted upon a bar 32, the upper end of which may be bent to form an upper bearing 33 for the rod 27*a*. The bar 32 may be mounted on the passage member 4, for example by bolts 34.

Referring to the form of Figs. 6 to 10, inclusive, I illustrate a lateral extension 35 of the central passage 4, which extends outwardly through the cylinders 1 and 2 adjacent an upper portion thereof. In that form I, therefore, provide an additional inspection passage 36 extending upwardly through the top of the heater and aligned with the pot 9.

In the form of Fig. 6 I illustrate also a rod 37 carrying baffles 38, which are staggered in relation to fixed baffles 39, the bottom baffle 39 having a bearing 40 for the lower end of the rod 37, the upper end of the rod being mounted in an upper bearing 41. Secured to and moving with the top of the rod 37 is a closure disc 42, having a manually manipulatable handle or lug 43. Moving unitarily with the closure 42 is the angular mirror support 44, which may have any suitable mirror or reflective surface 45 associated therewith. Preferably the surface 45 is integral with and forms a finish on the extension 44, as illustrated in Fig. 8, but it will be realized, of course, that if desired a separate mirror member 46 may be clamped thereto, as by any suitable clamps or securing members 47, as shown in Figs. 6, 7 and 9.

It will be understood that when the parts are in the position in which they are shown in Figs. 6 and 7, the inspection passage 36 is closed. When the operator rotates the member 42 to move it to open position, as shown in Fig. 8, he thereby positions the reflective surface 45 or the mirror 46 in proper position so that he can look laterally at the mirror and see reflected therein the interior of the pot 9. After his inspection is completed he merely rotates the closure 42 by using the lug 43 as a handle, and this at the same time moves the mirror out of alignment with the inspection passage 36 and closes the passage. Also, it will be noted that the movable baffles 38 move with the rod 37 and are moved out of the line of vision by the movement of the closure 42 to open position.

It will be understood that, when in the present specification I speak of looking into the pot, I might more accurately say that I provide means for inspecting the interior of the pot, or flame conditions above the pot when those flame conditions are such as to obscure the view of the interior of the pot to the user.

I illustrate in Fig. 6 a booster motor 50, operating the booster fan 51, which increases the air pressure about the pot 9. When such a booster is used, I employ a surrounding housing 52. It will be understood, of course, that I may employ such a booster in the form of Fig. 1, and I may omit it in the form of Fig. 6.

I may find it advantageous to dispense with the baffling system, as shown for example in the form of Fig. 11. In that case I may vary somewhat the structure of the closure. I illustrate for example in the forms of Figs. 11 to 16 a closure disc or cover 55, pivoted as at 56, at one side of the inspection passage 36. It may have any suitable handle lug 57 for manual operation. When the closure 55 is in the closed position in which it is shown for example in Figs. 12, 13 and 16, it closes the top of the inspection passage 36 and serves as a support of and protection for any suitable mirror element 58, which may be horizontally hinged as at 59. It may have an inclined lever, shown for example in Figs. 12, 13 and 15, as having an inclined lever 60, which, when the closure 55 is moved to open position, is engaged by a finger 61 of the closure 55. The finger 61 overlies the top of the inclined lever 60 and cams it into the position in which it is shown in Fig. 15, thus rotating the mirror member 58 about its horizontal axis 59 into the position in which it is shown in Fig. 15. In other words, the closure 55 is moved out of vertical alignment with the passage 36, and the result of this movement is a simultaneous lifting of the mirror 58 into the elevated or inspection position of Fig. 15. It is shown in Fig. 15 at an angle of about 45 degrees, though the parts may be so proportioned as to vary this angle to suit local conditions, the height of the heater and the desire of the operator.

In all of the forms of the present invention in which a mirror is employed the mirror is protected from any prolonged exposure to the sooting action of the combustion gases. In the forms of Figs. 11 and following it is further protected from any dust deposit since it abuts directly against the top of the closure 55.

It will be realized that, whereas I have described and illustrated a practical and operative device, nevertheless many changes may be made in the size, shape, number and disposition of parts without departing from the spirit of my invention. I therefore wish my description and drawings to be taken as in a broad sense illustrative or diagrammatic, rather than as limiting me to my precise showing.

I claim:

1. In combination, in a heater, a tank having a generally central vertical passage therein extending substantially from top to bottom thereof, a burner located adjacent a lower portion of said tank and having an open top aligned with and in communication with said central passage, a flue in communication with an upper portion of said passage, said flue extending outwardly therefrom, an observation passage in line with said central passage and said burner, and adapted to permit an observer to inspect combustion conditions in said burner through said central passage, movable baffle means located in said central passage, and means for moving it out of alignment with said observation passage and burner.

2. In combination, in a heater, a tank having a generally central vertical passage therein extending substantially from top to bottom thereof, a burner located adjacent a lower portion of said tank and having an open top aligned with and in communication with said central passage, a flue in communication with an upper portion of said passage, said flue extending outwardly therefrom, an observation passage in line with said central passage and said burner, and adapted to permit an observer to inspect combustion conditions in said burner through

said central passage, movable baffle means located in said central passage, a closure for said observation passage, and unitary means for moving said baffle means out of alignment with said observation passage and burner and for opening said closure.

3. In combination, in a heater, a tank having a generally central vertical passage therein extending substantially from top to bottom thereof, a burner located adjacent a lower portion of said tank and having an open top aligned with and in communication with said central passage, a flue in communication with an upper portion of said passage, said flue extending outwardly therefrom, an observation passage in line with said central passage and said burner, and adapted to permit an observer to inspect combustion conditions in said burner through said central passage, movable baffle means located in said central passage, a closure for said observation passage, and an inspection mirror adapted to be positioned over and in inclination to said observation passage, and unitary means for moving said baffle means out of alignment with said observation passage and burner and for opening said closure and for positioning said mirror in inclined inspection position over said observation passage.

4. In combination with an observation passage, a closure for said passage, an inclined mirror unitarily movable with said closure, said mirror being out of alignment with the observation passage when the closure is in position, and means for moving said closure to open position and for at the same time positioning said mirror over and at an angle to the axis of said observation passage.

5. In combination with an observation passage, a closure for said passage, an inclined mirror unitarily movable with said closure, and means for moving said closure to open position and for at the same time positioning said mirror over and at an angle to the axis of said observation passage, said closure being mounted for rotation about an axis adjacent one side of the observation passage, the closure extending radially from one side of said axis, the mirror extending outwardly from another side of said axis.

6. In combination with an observation passage, a closure for said passage, an inclined mirror unitarily movable with said closure, and means for moving said closure to open position and for at the same time positioning said mirror over and at an angle to the axis of said observation passage, said closure being mounted for rotation about an axis adjacent one side of the observation passage, the closure extending radially from one side of said axis, the mirror extending outwardly from another side of said axis, and baffles in said passage unitarily movable with said closure.

7. In combination with an observation passage, a closure for said passage, an inspection mirror, and means for simultaneously moving said closure to open position and for at the same time positioning said mirror over and at an angle to the axis of said observation passage, said mirror being out of alignment with the observation passage when the closure is in position.

8. A heater including a vertical, straight, tubular passage, a burner aligned with the bottom of the passage, an observation port at the upper end of the passage, through which the burner may be visible, a series of baffles arranged along the passage, masking the burner, and means for laterally displacing the baffles to permit inspection of the burner through the observation port.

9. A heater including a vertical, straight, tubular passage, a burner aligned with the bottom of the passage, an observation port at the upper end of the passage, through which the burner may be visible, a series of baffles arranged along the passage, masking the burner, a movable closure for the observation port and means operative in response to opening movement of the closure for laterally displacing the baffles to permit inspection of the burner through the observation port.

10. A heater including a vertical, straight, tubular passage, a burner aligned with the bottom of the passage, an observation port at the upper end of the passage, through which the burner may be visible, a series of baffles arranged along the passage, masking the burner, a movable closure for the observation port and means operative in response to opening movement of the closure for laterally displacing the baffles to permit inspection of the burner through the observation port, an observation mirror associated with the port closure and a connection between the mirror and the closure adapted to place the mirror in alignment with the observation port when the closure is in the open position whereby the burner is visible through the observation port in the mirror.

11. A heater including a vertical, straight, tubular passage, a burner aligned with the bottom of the passage, an observation port at the upper end of the passage, through which the burner is visible, a movable closure for the observation port, an observation mirror associated with the port closure and a connection between the mirror and the closure adapted to place the mirror in alignment with the observation port when the closure is in the open position whereby the burner is visible through the observation port in the mirror, said mirror being located at about the height of the observer, its lower face constituting the reflective surface.

12. In combination, in a heater, an outer housing, a water container formed within said housing and having a generally vertical flue member surrounded by said water container, a horizontal flue member in communication with said vertical flue member, extending outwardly through the side of the outer housing, a burner pot vertically aligned with said vertical flue member and located at the bottom thereof, means for supplying liquid fuel to said pot, said horizontal flue member having an inspection aperture, adapted to permit an observer to inspection combustion conditions in said burner through said vertical flue element, and closure means therefor, adapted to permit downward observation from above of combustion conditions in the burner, and an inclined observation mirror, and means for supporting it in general vertical alignment with said inspection aperture, and means for moving said closure means and said mirror unitarily, and for substantially simultaneously opening the closure and positioning the mirror in vertical alignment with said vertical flue member.

STANLEY PERRY.