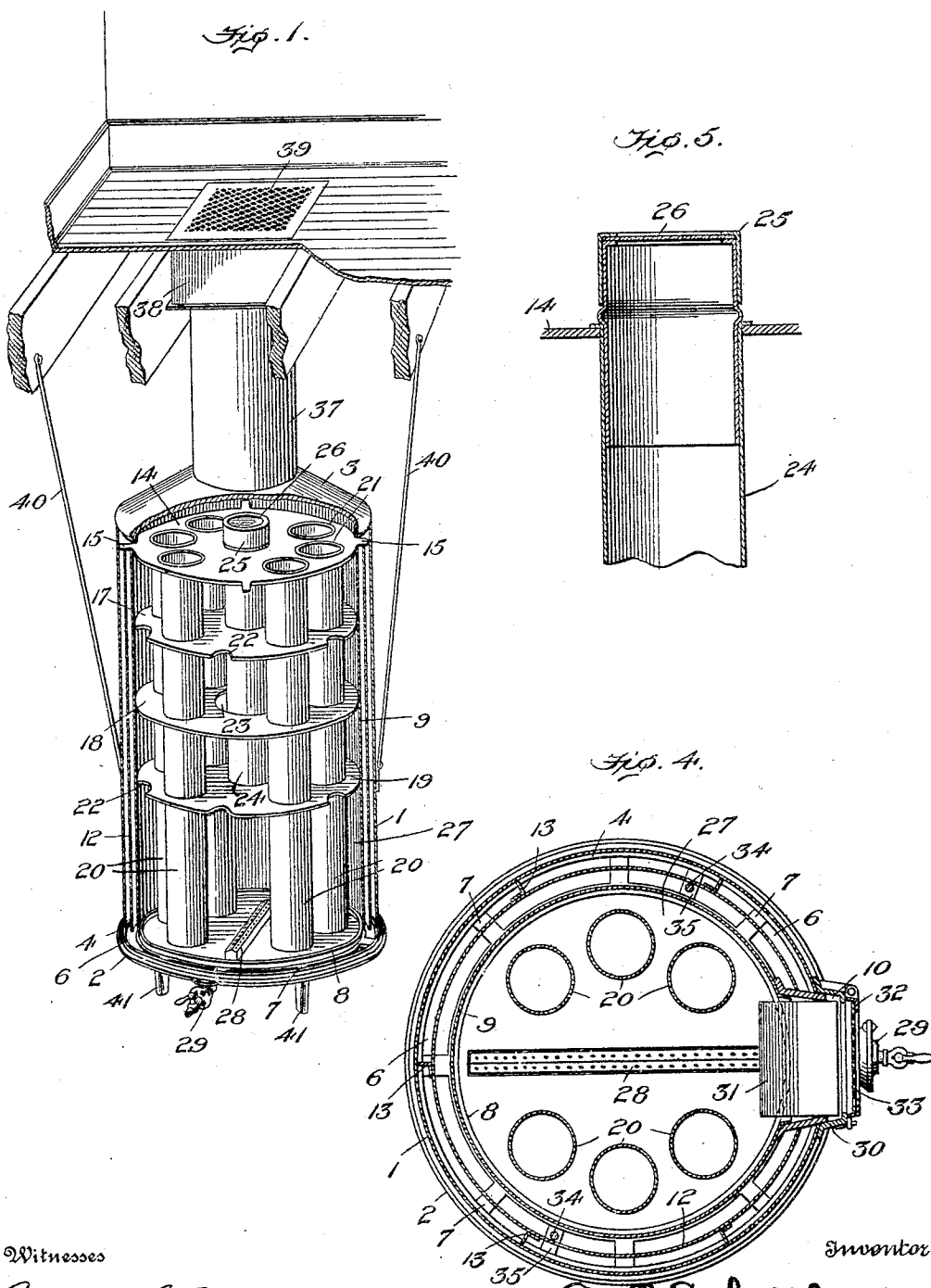


A. L. SCHELLHAMMER.
HEATER.
APPLICATION FILED JULY 29, 1908.

939,925.

Patented Nov. 9, 1909.
2 SHEETS—SHEET 1.



Witnesses

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2 SHEETS—SHEET 2.

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Fig. 2.

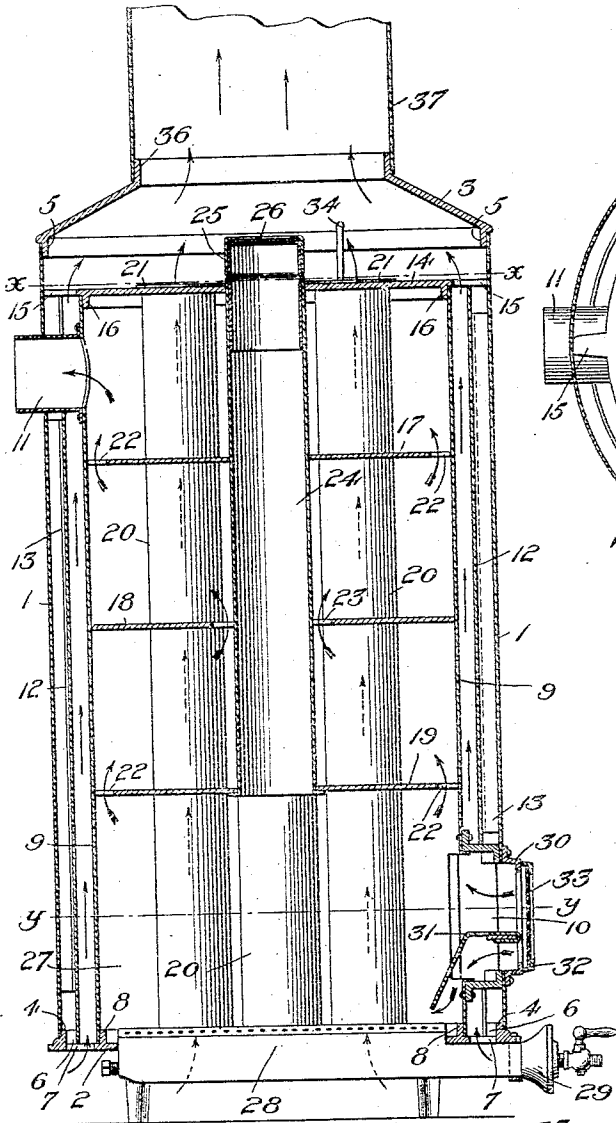


Fig. 3.

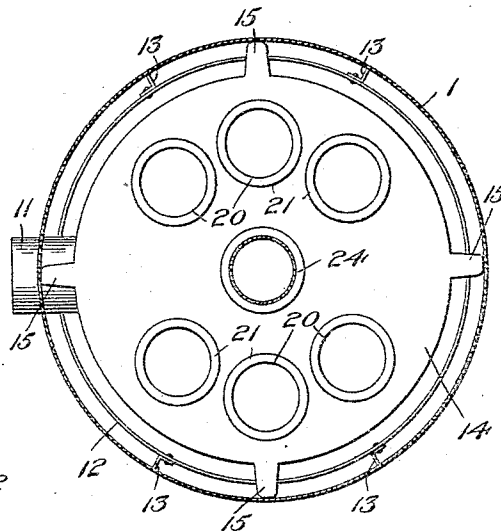


Fig. 6.

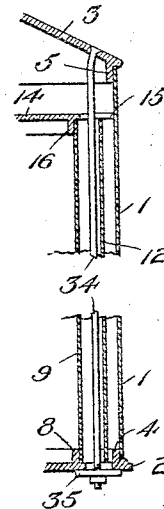
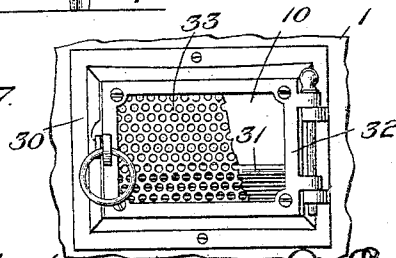


Fig. 7.



Witnesses

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UNITED STATES PATENT OFFICE.

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HEATER.

939,925.

Specification of Letters Patent.

Patented Nov. 9, 1909.

Application filed July 29, 1908. Serial No. 445,952.

To all whom it may concern:

Be it known that I, ALFRED L. SCHELLHAMMER, a citizen of the United States, residing at Warren, in the county of Warren and State of Pennsylvania, have invented certain new and useful Improvements in Heaters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to house heating apparatus, but has reference more particularly to gas heaters or furnaces of moderate size and capacity, and while the principles of construction and operation are applicable to large furnaces employing gas, coal, or liquid fuel, the present invention is more especially designed and arranged for use as an auxiliary or hall heater and for a mixture of gas and air as fuel.

Among other objects this invention has for its purpose the production of a heater which is economical both in its cost of construction and consumption of fuel; one which is peculiarly durable and efficient owing to its structural arrangement, and superior radiating facilities; a heater which is self contained and provided with novel and improved means both for supporting combustion and carrying off the products of combustion; a portable, sanitary, ventilating heater, which is dust, smoke and gas tight, and built upon scientific principles.

The invention will be hereinafter particularly described and pointed out in the claims following.

In the accompanying drawings which form part of this application, and whereon corresponding reference characters indicate like parts in the several views: Figure 1 represents a perspective view of my invention, partly broken away to show its interior arrangement, and suspended beneath a floor register. Fig. 2 is a relatively enlarged vertical central section of the invention. Fig. 3 is a transverse section of the heater taken on the line $x-x$ of Fig. 2. Fig. 4 is also a transverse sectional view, but taken on the line $y-y$ of said Fig. 2. Fig. 5 is a vertical central sectional view on a still larger scale, of a central sight tube and its transparent cover. Fig. 6 is a fragmentary view similar to Fig. 2 showing one longitudinal

tie-bolt as part of the means of securing the structure together, and Fig. 7 is a front elevation of the heater or furnace door, its perforated panel being partly broken away to disclose a horizontal deflecting partition.

Reference being had to the drawings and characters thereon, 1 indicates the outer casing preferably of galvanized sheet iron, 2 the bottom preferably cast, and 3 the top or dome also by preference of cast iron forming the exterior surfaces of the present invention. Bottom 2 and top 3 are provided with inturned circumferential flanges 4 and 5 respectively, and are both inclosed by the surrounding outer casing 1 when placed in position. Bottom 2 is also configured by air spaces 6 circumferentially arranged inside of the flange 4, and separated from each other by radial webs 7, the latter as a means for supporting the central portion of said bottom 2. At the inner edge of said spaces 6 is provided a second circumferential inturned flange 8 similar to the flange 4 but of smaller diameter, and these two concentric flanges 4 and 8 perform like functions with relation to the outer and extreme inner casing of the structure, as will later appear. Rising from said circular flange 8 is the inner cylindrical casing 9 similar to the outer casing 1, and like it broken only by the doorway 10, and smoke outlet 11, as best shown by Fig. 2. Between the casings 1 and 9 is located a cylindrical shield 12 preferably of bright tin, arranged concentrically with relation to said casings 1, 9, and offset from the former by vertical angle irons 13.

The top of inner casing 9 is closed by an uppermost top-plate or cover 14 preferably cast with radial spacing-lugs 15 for engaging the inner wall of the outer casing 1, as best shown by Fig. 3, and with an inturned or downwardly projecting circumferential flange 16 corresponding in diameter with the aforesaid flange 8 and like it inclosed by the casing 9. Beneath the top plate or cover 14 within casing 9, are positioned baffle-plates 17, 18 and 19; while penetrating all of said plates snugly as by a drive fit, and likewise the bottom 2, is a series of vertical air tubes 20 flanged or upset upon both extremities, as at 21, to securely bind these parts together. The intermediate baffle plates 17, 18 and 19 are provided with passages in staggered relation for the products

of combustion, for example plates 17 and 19 as shown are broken by peripheral indentations 22, while plate 18 is perforated by a single enlarged central opening 23, but obviously the form and location of said passages is immaterial so long as they are alternately arranged in different vertical planes or staggered relation.

Centrally arranged and extending downward through plates 14, 17, 18 and 19 is a sight tube 24 similar in appearance to the tubes 20 but unlike them terminating immediately beneath plate 19 and at its opposite end snugly closed by a telescoping sleeve and a gas-tight cap 25 fitted with a sheet of transparent material 26 preferably mica, the utility of which will hereinafter appear in a description of operation.

Beneath the lowermost baffle-plate 19 is a fire-chamber 27 at the bottom of which is placed a suitable burner 28 connected with a source of gas supply and equipped with the usual air mixer 29. While opening into said fire-chamber 27, through casings 1, 9, and intermediate shield 12, is a door-frame 30 fitted with a horizontal deflecting partition 31. This partition as shown by Figs. 2, 4 and 7, is of a width to correspond with the door-frame 30 and extends downward into close proximity with the burner 28 for the important purpose of supplying oxygen to the outside and both sides of said burner. Hinged to the frame 30 is a door 32 having a panel 33 perforated as shown by Fig. 7, for admitting a supply of air in finely divided streams, a portion of which must of necessity impinge upon and be deflected by the downturned surface of the aforesaid partition 31.

Passing downward from the dome 3 between the inner casing 9 and its surrounding shield 12, is a plurality of tie-rods or bolts 34 the opposite or lowermost ends whereof are secured beneath bottom 2 by agency of washers or bridge-plates 35 thus drawing all parts of the structure securely together.

The upper contracted edge of dome 3 is provided with a collar 36 superimposed by a hot-air pipe 37, which latter in turn connects with an ordinary register box 38 finished by an ordinary register 39; and as thus constructed and arranged this self-contained invention may either be suspended beneath the floor by suitable guy rods or chains 40, as indicated by Fig. 1, or supported upon legs 41 cast upon bottom 2, as indicated by Fig. 2.

This being a general description of my invention, its use is that of all house furnaces or heaters, but its operation is as follows: Gas, presuming this to be the fuel employed, enters burner 28 in the usual manner with a proper admixture of air via mixer 29. This is ignited by a burning match or taper pre-

viously introduced through door 30, or by a pilot flame constantly burning in the fire-chamber 27, if the heater is so equipped. When equipped with a pilot flame (not shown in the present illustrations) same is, as usual, controlled by a valve-rod projecting through the floor. And it will here be noted that the condition of burner 28 may readily be inspected through sight tube 24 and its transparent top 25 visible at all times from above through register 39. Heat thus produced in fire-chamber 27 causes an inflow of air in a multiplicity of finely divided streams through the perforations in panel 33, and a portion of this inflow or supply is constantly deflected by the downwardly projecting partition 31 as indicated by the arrows beneath said partition in Fig. 2. The said deflected supply of cold air being of greater specific gravity than the already heated contents of chamber 27, and being directed by partition 31 as aforesaid, spreads over bottom 2 and affords an abundant supply of oxygen at both sides of the burner 28 to assist combustion; while the balance of such inflow or supply, following the course indicated by arrows above partition 31, assists in carrying the products of combustion away. In their ascent, these products, following the course indicated by feathered arrows in Fig. 2, are first baffled by plate 19, they then spread to its outer edge finding an exit through indentations 22, next impinging upon plate 18 they must travel to its center before escaping through perforation 23, they are next baffled by plate 17 through which they again find peripheral egress via indentations 22, and are finally arrested by the top plate 14 finding an exit through smoke outlet 11 to a suitable flue. In the meantime air to be heated, following the course indicated by unfeathered arrows in Fig. 2, enters all vertical tubes 20 from below, is highly heated in its passage through the inner casing 9, and is delivered into the heat-dome beneath top 3, in like manner as air entering the circumferential spaces 6 from below travels upward between casings 1 and 9 also to said heat dome from whence it rises through hot air pipe 37 and register 39 to its point of utilization. During this continued passage of heated air and the separated products of combustion it will be noted that the double casing 1, 9 performs two functions, first, that of heating and inducing a flow of air from the bottom spaces 6, and secondly, that of preventing loss of heat by radiation below the floor line, shield 12 materially assisting in the latter result, partially because of its bright reflecting qualities.

This being a description of my invention as embodied in one practical form of construction, I desire it understood that I do not limit myself to the form or uses herein-

before set forth. On the contrary, the novel features of invention are equally applicable to large and small heaters, round, oval or square, arranged to receive their fresh air
 5 supply from the outside atmosphere, or from the interior of a cellar wherein they may be located, as in the present illustrations. In like manner other structural changes and arrangement of parts which will readily be
 10 suggested to persons skilled in the art may be made without departing from the spirit of the invention.

Having thus described my invention, I claim:

15 1. A heater comprising in combination a casing, a suitable burner, a sight tube within the casing directed toward and terminating above said burner, a transparent closure for
 20 said tube, and means for diverting the products of combustion away from said tube, substantially as described.

2. A heater comprising in combination a casing, a suitable burner, a vertically arranged sight tube within the casing directed
 25 toward and terminating above said burner, a transparent closure for said tube, and means for diverting the products of combustion away from said tube, substantially as described.

30 3. A heater comprising in combination a casing, a suitable burner, a sight tube within the casing having an open end directed toward and terminating above said burner, a transparent closure for said tube above
 35 its open end, and means for diverting the products of combustion away from said tube, substantially as described.

4. A heater comprising in combination a casing, a suitable burner, a sight tube within
 40 the casing directed toward and terminating above said burner, a transparent closure for said tube, and means for diverting the products of combustion away from said tube including a baffle-plate near the lower end
 45 thereof, substantially as described.

5. A heater comprising in combination a casing having inner and outer concentric walls, a suitable burner, a central sight tube within the casing directed toward and terminating
 50 above said burner, a transparent closure for the top of the sight tube, and a plurality of baffle plates surrounding said tube, substantially as described.

6. A heater comprising in combination a casing, a suitable burner, a sight tube within the casing directed toward and terminating
 55 above said burner, a transparent closure for said tube, and a baffle plate surrounding the lower end of said tube, substantially as described.

7. A heater comprising in combination a casing, a suitable burner, a sight tube within the casing directed toward and terminating
 60 above said burner, a transparent closure at the upper end of said tube, and a baffle plate

surrounding said tube at its lower end, substantially as described.

8. A heater comprising in combination a casing, a suitable burner, a sight tube within the casing directed toward and terminating
 70 above said burner, a transparent closure for said tube, and a baffle plate surrounding the sight tube in a plane below said transparent closure, substantially as described.

9. A heater comprising in combination a casing, a suitable burner, a sight tube within the casing directed toward and terminating
 75 above said burner, a transparent closure for said tube, and a baffle plate interposed between said tube and casing having portions cut away to form passages for the products
 80 of combustion, substantially as described.

10. A heater comprising in combination a casing, a suitable burner, a plurality of baffle plates above said burner having portions
 85 cut away to form passages for the products of combustion, a sight tube in alinement with said burner and intersecting all of said baffle plates, a transparent closure for said tube, and independent outlets for the prod-
 90 ucts of combustion and heated air, substantially as described.

11. A heater comprising in combination a casing, a suitable burner, a plurality of baffle plates above said burner having portions
 95 cut away in alternating vertical planes to form passages for the products of combustion, a sight tube in vertical alinement with said burner passing through all of said baffle plates, a transparent closure for said
 100 tube, and air tubes passing through the bottom of the heater and each of the plates aforesaid, substantially as described.

12. A heater comprising in combination, a combustion chamber, a burner, a plate above
 105 said burner for arresting the products of combustion, means for permitting passage of heated air through said plate, a door-way through which air is introduced, and a deflector situated within the door-way adapted
 110 to deflect a portion of the inflowing air to the burner, substantially as described.

13. A heater comprising in combination, a combustion chamber, a burner, a plate above
 115 said burner for arresting the products of combustion, means for permitting passage of heated air through said plate, a door-way through which air is introduced, and a deflecting partition situated within the door-
 120 way adapted to deflect a predetermined portion of the inflowing air to the burner, substantially as described.

14. A heater comprising in combination, a combustion chamber, a burner, a plate above
 125 said burner for arresting the products of combustion, means for permitting passage of heated air through said plate, a door-way through which air is introduced, and a horizontal partition situated within the door-
 130 way having an angular extension terminat-

ing near the base of the heater adapted to deflect a portion of the inflowing air to the burner, substantially as described.

15 A heater comprising in combination, a combustion chamber, a burner, a plate above said burner for arresting the products of combustion, means for permitting the passage of heated air through said plate, a door-way through which air is introduced, a horizontally arranged deflecting partition situated within the door-way terminating in a

plane adjacent to that occupied by the burner adapted to deflect a portion of the inflowing air to said burner, and a suitable closure for said door-way, substantially as described. 15
In testimony whereof I affix my signature, in presence of two subscribing witnesses.

ALFRED L. SCHELLHAMMER.

Witnesses:

H. M. STERLING,
G. P. RITTER.