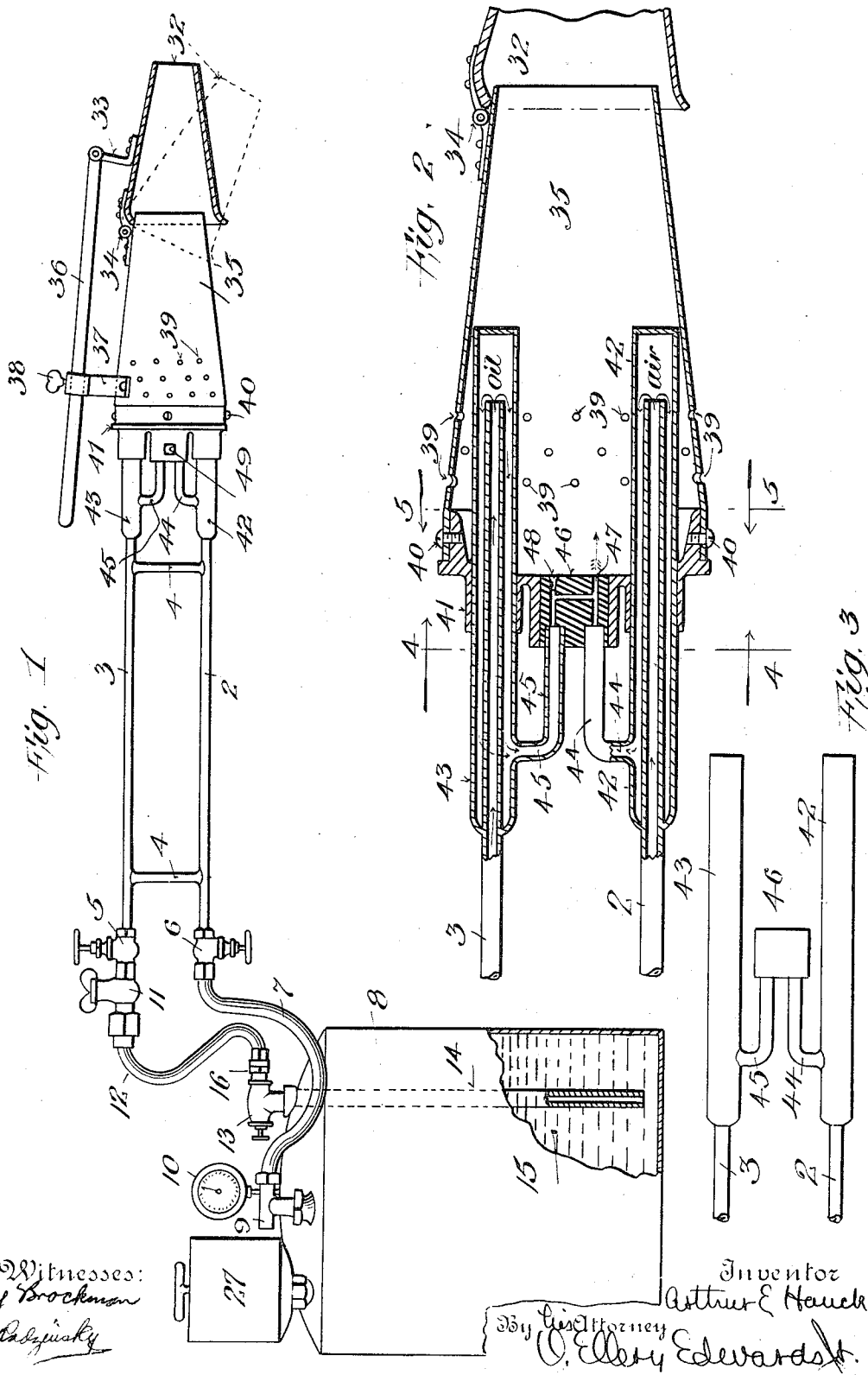


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A. E. HAUCK.
HEAVY OIL BURNER.
APPLICATION FILED MAY 22, 1916.

Patented June 26, 1917.

2 SHEETS—SHEET 1.



Witnesses:
Ray Brockman
A. Radzinsky

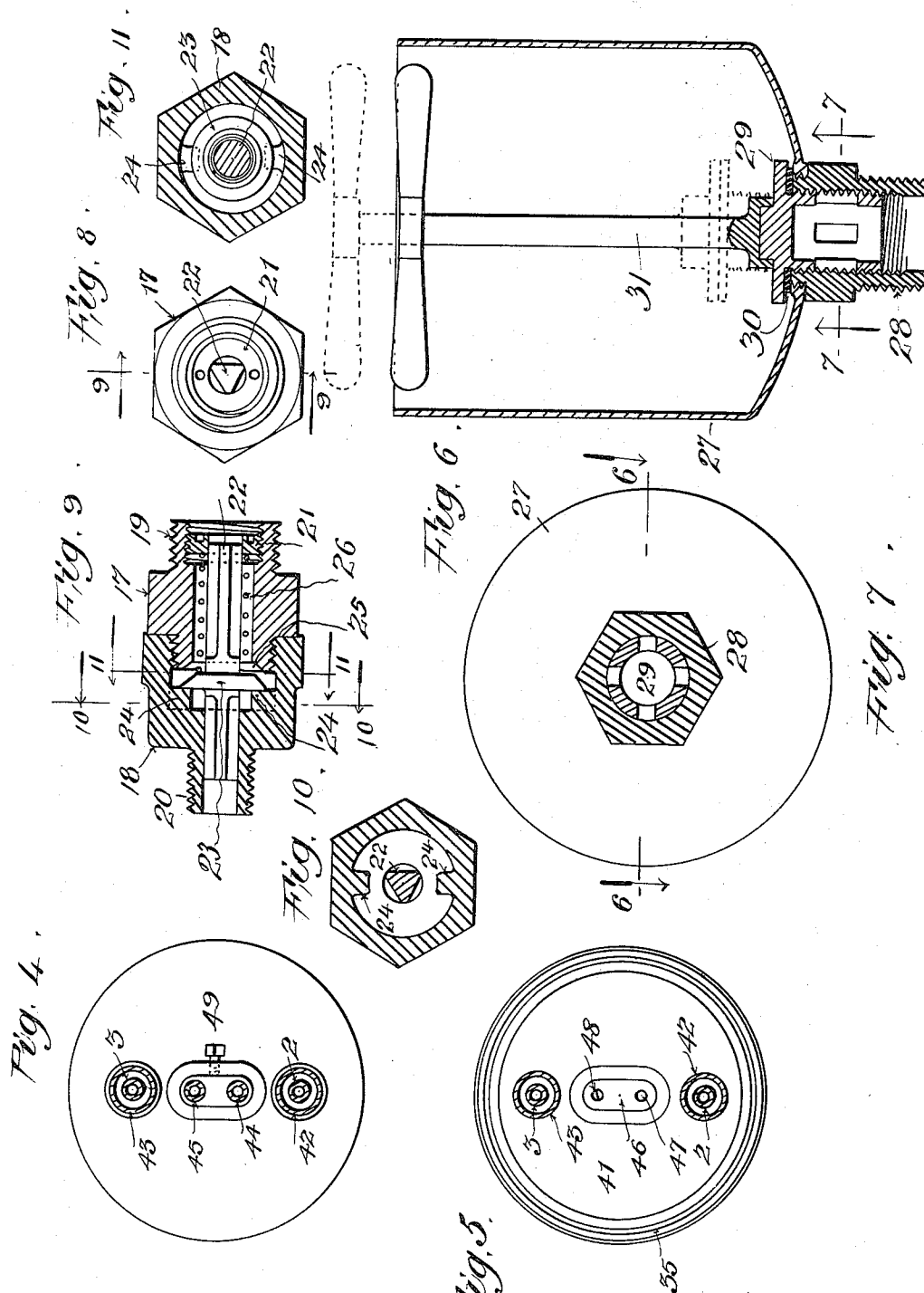
Inventor
Arthur E. Hauck
By *Edwards* Attorney

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UNITED STATES PATENT OFFICE.

ARTHUR E. HAUCK, OF NEW YORK, N. Y.

HEAVY-OIL BURNER.

1,231,019.

Specification of Letters Patent. Patented June 26, 1917.

Application filed May 22, 1916. Serial No. 99,033.

To all whom it may concern:

Be it known that I, ARTHUR E. HAUCK, a citizen of the United States, and a resident of the city of New York, county of Kings, and State of New York, have invented a new and useful Improvement in Heavy-Oil Burners, of which the following is a specification.

The object of my invention is to provide a device of this class which can burn to advantage the cheaper grades of heavy oil, and make therefrom an intensely hot flame. This object is accomplished by my invention, one embodiment of which is hereinafter more particularly set forth.

For a more particular description of my invention, reference is to be had to the accompanying drawings, forming a part hereof, in which—

Figure 1 is a side elevation of my improved burner and its connected parts.

Fig. 2 is a longitudinal section of the burner.

Fig. 3 shows a portion of the burner and preheaters.

Figs. 4 and 5 are sectional views, taken on the lines 4—4 and 5—5 respectively, of Fig. 2, looking in the direction of the arrows.

Fig. 6 is a sectional view of an oil funnel and vent, the section being taken on the line 6—6 of Fig. 7, looking in the direction of the arrows.

Fig. 7 is a sectional view, taken on the line 7—7 of Fig. 6, looking in the direction of the arrows.

Fig. 8 is an end view of a safety valve.

Fig. 9 is a longitudinal section of the same, taken on the line 9—9 of Fig. 8, looking in the direction of the arrows.

Figs. 10 and 11 are sectional views, taken on the lines 10—10 and 11—11 of Fig. 9 respectively, looking in the direction of the arrows.

Throughout the various views of the drawings, similar reference characters designate similar parts.

My improved burner 1 is provided with an air pipe 2 and an oil pipe 3 which are rigidly secured thereto and connected together by crossings 4. The pipe 3 runs to a valve 5 and the pipe 2 to a valve 6. The valve 6 is connected by a hose 7 to the top of a tank through a T 9 at the top of the tank so that the interior of the tank 8 is subjected to an air or steam pressure, whatever it may

be, say 125 pounds to the square inch. The means for supplying air or steam to the T 9 is not shown, but it is preferably an ordinary hose connected to an air compressor for air, or a boiler for steam, but may be any other suitable means. The top of the tank 8 also contains an air pressure gage 10 which indicates the pressure upon the interior of this tank.

The valve 5 is connected to a strainer 11 and the strainer is connected to a hose 12 which connects with a small valve 13 on the top of the tank 8, and this valve 13 is connected to a long pipe 14 which runs to the bottom of the tank 8 so that air pressure on top of the liquid 15 in the tank 8 will force the same up through the pipe 14, valve 13, tube 12, etc. For safety it is desirable to interpose a safety valve 16 between the hose 12 and the valve 13. The safety valve is shown in detail in Figs. 8 to 11 inclusive, which consists of two valve casings 17 and 18, the former being the outflow casing and the latter the inflow. These two casings are secured together by screw threads, or any other suitable means, and are so shaped that they form a chamber between their ends. The casing 17 has screw threads 19 which are adapted to be secured to the hose 12 by a suitable coupling, and the casing 18 has also suitable threads 20 which are adapted to engage the valve 13 in the conventional manner. The outflow end of the casing 17 is screw-threaded to receive a suitable perforated screw plug 21, in which is slidably mounted a plunger 22 which has a recessed stem so as to permit liquid to flow about the stem, and this is true of the other end. In its middle the stem carries a disk 23 which is adapted to rest either against the lugs 24 which project inwardly, as shown in Figs. 9 and 10, from the walls of the casing 18, or a seat 25 at the end of the casing 17. A coil spring 26 normally rests between the disk 23 and the plug 21 and holds the disk 23 off the seat 25 and against the lugs 24. Whenever there is an excessive flow of liquid under pressure by the disk 23, as can occur only when the hose 12 has become broken, or some other accident has caused an extended leak, in such an event such a rapid flow will close this valve by forcing the disk 23 on the seat 25 and thereby prevent oil from leaking out of the apparatus and getting on fire and causing trouble. At all

other times the disk 23, under the action of the spring 26, remains as shown. By adjusting the plug 21, the tension of the spring 26 can be adjusted to correspond.

5 The top of the tank 8 carries a suitable funnel 27 by means of which it may be filled when convenient. This funnel 27 is screw-threaded at its bottom to receive the nipple 28 which is also screw-threaded and secured
10 by screw-threads to the top of the tank 8. The nipple 28 is normally closed by a hollow plug 29 which has a flange underneath which is placed a gasket 30, and a wrench 31 is preferably fixed to the plug 29 so that by
15 turning the wrench the plug may be removed or inserted, as desired. This plug not only serves for the purposes of stopping the hole, but also as a vent because it can be opened before liquid is put in the funnel 27, and
20 then any air pressure inside the tank 8 may be relieved before any oil is inserted. The oil is inserted by pouring the same into the funnel 27 and allowing it to run into the tank, and preferably through the holes in
25 the bottom of the screw plug 29.

The burner has numerous parts which will now be described, beginning with the hinged cap or flame directing nozzle 32 which is seen at the extreme right of Figs. 1 and 2.
30 This cap 32 has an upwardly extending ear 33 which is fixed thereon and is connected by a hinge 34 by which it is hingedly connected to the burner tube 35, which is preferably made conical so as to fit the interior
35 of the cap 32 and yet allow sufficient room for movement of the cap, as indicated by dotted lines in Fig. 1. The ear 33 on the cap is pivotally connected to a link 36 which slides in a bracket 37 fixed to the burner
40 tube 35, and may be held in any suitable position by means of a suitable set screw 38. By this simple means the direction of the flame may be diverted, within limits, without shifting the axis of the burner 1.

45 The burner tube 35 has a slight taper as shown and suitable air receiving perforations 39 which admit any necessary air that may be required to perfect the combustion of the burner when the same is in use.

50 The rear end of the tube 35 is secured by suitable cap screws to the flanged plate 41 which is connected to the pipes 2 and 3, by means which will now be described. These pipes 2 and 3 are each provided with large
55 tubes 42 and 43 respectively which are closed at their forward ends which are beyond the holes 39 and well within the tube 35. As will be seen from Fig. 2, the pipes 2 and 3 project well into these tubes and beyond the
60 holes 39. Near where these tubes 42 and 43 join their respective pipes, they are provided with laterally extending tubes 44 and 45 respectively, which are bent forwardly and parallel with the pipes 2 and 3, as shown,
65 and end in a casting 46 to which they are se-

cured. The interior of these tubes 44 and 45 are connected to H-shaped passage ways 47 in the casting 46, one leg of which is closed by a screw 48, this screw being placed opposite the tube 45 so as to force the oil
70 into the path of the air which issued from the tube 44.

The block 46 may be secured to the plate 41 by any suitable means, as a set screw 49, and it will be understood that the tubes 42
75 and 43 also fit snug in suitable openings in the base 41. It is preferable to provide flanges about the casting 46 when the tubes 42 and 43 extend laterally from the plate 41, although this may be modified if desired.

80 In view of the foregoing, the operation of my improved burner will be readily understood. Oil is inserted in the tank 8, as above described, while there is no pressure upon
85 the interior of this tank in excess of atmospheric pressure, and when the oil is in place the wrench 31 is turned so as to put the plug 29 in position on the gasket 30, so as to insure a tight joint which will stand a pressure
90 of about 125 pounds to the square inch, or whatever is used, without leakage. Air or steam is then applied through the T 9 from an ordinary compressor or boiler, and this puts pressure on top of the oil, and
95 also permits air to flow through the tube 7 to the valve 6, and there it is somewhat reduced in pressure so as to make a slightly greater pressure in the tank 8 than in the pipe 2. The difference is very slight and
100 may be varied according to the nature of the flame to be produced. It will be noticed that this air, when air is employed, is ordinary compressed air, and as such contains moisture which, on damp days, will be material. Oil flow is regulated by the valve 13 and
105 solids are caught in the strainer 11 which must be emptied from time to time, as is obvious. The oil flow can further be regulated by the valve 5, should such regulation be desirable, and then the oil passes through
110 the pipe 3 and into the tube 43 where it is pre-heated after the burner is once started. Air or steam passes from the tube 2 into the tube 42 where it is heated, after the burner is started, and any water or mois-
115 ture that it may contain is then vaporized and changed into steam, and the commingled air and steam pass together through the pipe 44 where they act as an inspirator in the opening 47 to draw the oil and mix with the
120 same, and these are ignited upon their emission from the hole 47, so that the burner will burn and it should burn with a very intense hot flame, which is suitable for all heating purposes for which such devices are ordi-
125 narily used. By closing the valves 5 and 6 the fuel and air may be shut off the burner and then the flame goes out.

While I have shown and described one embodiment of my invention, it is obvious 130

that it is not restricted thereto but is broad enough to cover all structures that come within the scope of the annexed claims.

What I claim is:

5 1. In a device of the class described, a tank and means connected therewith for burning oil and air, a funnel secured to the top of said tank and a screw-plug in said funnel whereby the interior of the tank may
10 be vented and then filled and then the interior sealed against substantial pressure by the action of said plug.

2. In a device of the class described, means for supplying a pipe with a predetermined
15 flow of oil under pressure, including means for stopping the flow of oil in the event of an accident, said means including two casings secured together, one of which has a valve seat and a spring seat and a valve stem
20 adapted to slide between said casings with a disk on said stem, adapted to engage said seat to form a closed joint therewith, a spring for normally keeping said disk off said seat and a screw plug for adjusting the tension
25 of said spring.

3. In a device of the class described, a burner having a base with a burner tube mounted thereon, and means for supplying this burner with oil under pressure, means
30 for supplying the same with air or steam under pressure, tubes fixed in the base for

causing the oil and air, or oil and steam to be pre-heated before going into the combustion chamber of the burner, and means for causing the oil to be sprayed into the air or
35 steam before said combustion chamber is reached.

4. In a device of the class described, a burner having a tube and a flanged base, air and fuel preheating tubes in said base, and
40 a block between said tubes and connections between said block and said tubes.

5. In a device of the class described, a burner tube having a base secured thereto, parallel and concentric tubes secured in said
45 base, two of said tubes being closed at their forward ends, and two being open, the outer tubes being closed and the inner tubes being open, laterally extending tubes running from said outer tubes, these laterally extending
50 tubes being bent forward and a burner block connected to said laterally extending tubes.

6. In a device of the class described, a burner adapted to be supplied with oil and
55 air under pressure, provided with a base and a tube projecting from said base, a conical cap hingedly connected to said tube and means for adjusting the position of the cap on said tube.

ARTHUR E. HAUCK.