Sept. 26, 1933. R. S. WHALEY 1,928,442

VALVE MECHANISM FOR OIL BURNERS

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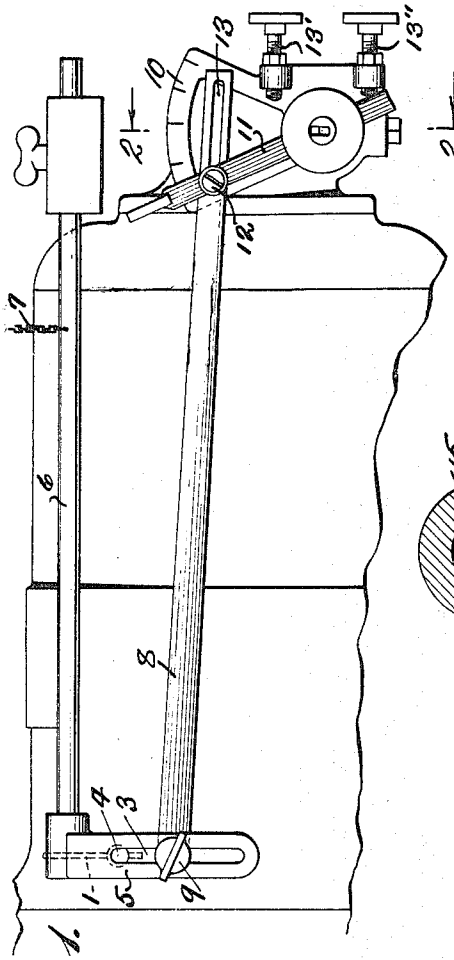

Fig. 1.

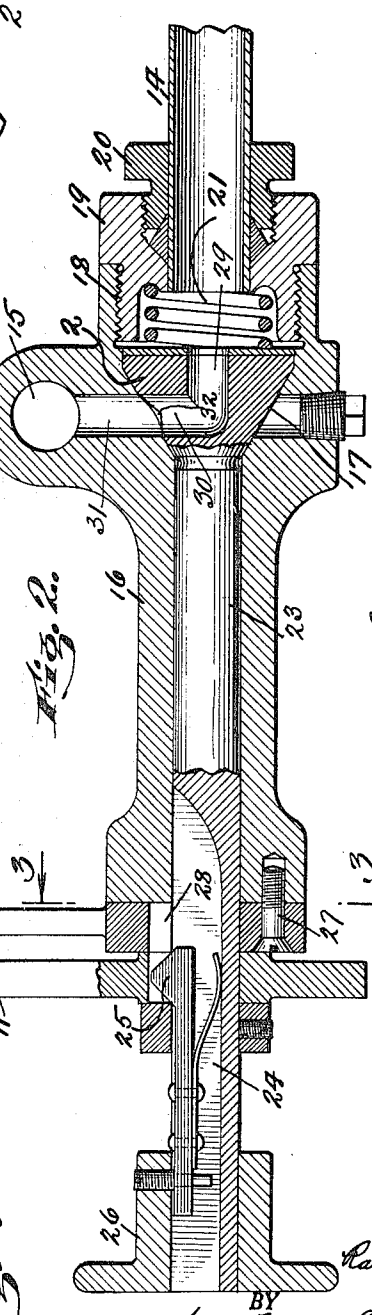

Fig. 2.

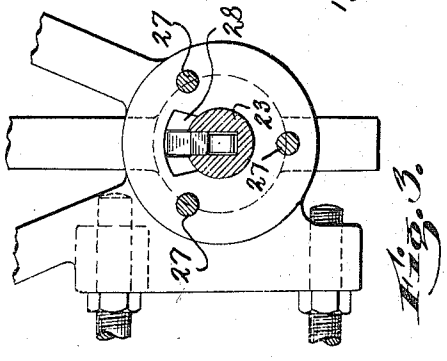

Fig. 3.

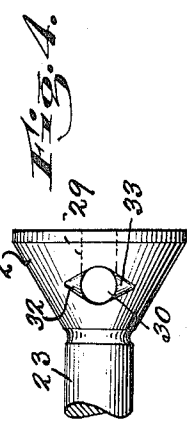

Fig. 4.

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VALVE MECHANISM FOR OIL BURNERS

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6 Claims. (Cl. 137—144)

This invention relates to an improvement in oil burning apparatus and is particularly directed to the provision of a construction wherein the air valve and oil valve are connected together for simultaneous operation so that both the air and oil may be shut off automatically when, for example, the pressure in the boiler or other heat exchanger reaches the maximum for which the apparatus is set, means being provided, however, whereby the oil valve may be adjusted independently of the air valve to enable a richer mixture to be fed to the burner at any time desired, as for example in initially starting the burner in operation.

A further object of my invention is the provision of improved construction in the control or oil valve itself whereby certain advantageous results are obtained as compared with the ordinary oil valve as now employed.

In oil burner installations of the general character to which this invention relates it is customary for the apparatus to be set so far as the air valve and oil valve are concerned by the man making the installation so that the proper mixture of oil and air is supplied to the burner nozzle.

It is desirable, however, under some conditions, as in starting these machines in operation, for example, to be able to supply a richer mixture to the burner nozzle than when the machine has been running. The present invention provides a construction whereby this may be done, means being provided whereby the oil control valve may be adjusted temporarily independently of the air valve by disconnecting the operative connection between the two valves, the oil valve, after this temporary adjustment, being returned to its original position and again connected to the air valve, so that the original setting of both valves is restored to normal.

In the accompanying drawing:

Fig. 1 is a fragmentary elevation of an oil burning apparatus employing my improved mechanism;

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

Fig. 3 is a view taken substantially on the line 3—3 of Fig. 2; and

Fig. 4 is a detail of the control or oil valve.

Referring to the drawing in detail: 1 designates the air valve or damper and 2 the oil control valve of an oil burner. The air valve 1 is pivoted and connected through a slot 3 and stud 4 with an arm 5 attached to regulating rod 6. Attached to this rod is a chain 7 connected operably to a pressure regulator or other control on the boiler, whereby upon certain conditions being reached in the boiler the rod 6 will be actuated to close the air valve and as will be pointed out the oil valve as well.

Adjustably connected to the arm 5 is a link 8, the end of the link being held in adjusted position with respect to the arm 5 by a thumb screw 9 riding in the slot 3.

At the oil intake end of the burner I provide a quadrant 10 which for convenience may be calibrated as shown on the drawing and moving over the face of this quadrant is an oil valve operating arm 11. This arm is connected to the link 8 by a bolt 12. The setting of the arm with respect to the link is permitted by the provision of a slot 13 in the link while the maximum and minimum movements of the arm are controlled by stops 13' and 13'', thus preventing an untrained operator from turning the fire either too low or too high for safety.

It is to be noted that the construction of the operating connections between the air and oil valves is a rigid one, all lost motion being eliminated.

14 designates the intake or supply pipe through which oil is supplied to the burner, the oil passing through this pipe through the control valve 2 by suitable ports to the burner at 15.

The control or oil valve is mounted in a suitable housing or casing 16, the valve being rotatable to any desired position in this housing on a seat 17. As will be observed from the drawing the valve is conical.

It is to be noted also that part of the conical seat 17 for the valve is between the oil port 31 and the valve stem 23, this construction taken in connection with the conical shape of valve and seat makes it unnecessary to provide packing or a stuffing box for the valve stem. It will be appreciated also that due to the conical shape of the valve and seat, and the location of the oil port with respect to the valve and seat, the higher the pressure in the oil line the firmer the valve is seated without in any way varying the flow of oil through the ports.

The end of the housing 16 is provided with an internally threaded bore as shown at 18 for receiving a plug 19 which in turn receives the packing gland 20 for the oil pipe.

The oil valve 2 is backed by a spring 21 which holds the valve to its seat.

The stem 23 of the control valve extends along through the housing 16, the projecting end of this stem being provided with a keyway 24 which receives a key 25 attached to a knob 26 which is

slidably and rotatably mounted on the end of the valve stem 23. The key 25 projects above the top of the valve stem so that when the key is in the position shown in Fig. 2 it will lie in and engage a slot provided for that purpose in the valve control arm 11, the valve stem 23 passing through the control arm. By this construction it will be appreciated that with the key 25 in the position shown in Fig. 2 the valve stem 23 cannot be rotated to adjust the valve 2 without effecting movement of the control arm 11 and hence movement of the air valve 1.

As above mentioned, however, it is desired that means be provided whereby the valve 2 and hence the valve stem 23 may be rotated without any movement of the control arm 11. To this end, therefore, the quadrant 10 which is rigidly secured by bolts 27 to the housing 16 is bored adjacent its lower end so as to loosely receive the valve stem 23. This bore which is designated 28 is sufficiently larger than the valve stem 23 to receive the key 25. Consequently if the knob 26 be pushed inwardly, that is to say, slid along the valve stem 23 from the position shown in Fig. 2 to a position where the key 25 will lie in the bore 28 in the quadrant 10 it will be obvious that the valve stem 23 is at that time disconnected from the valve control arm 11 and that the knob 26 may be rotated to effect rotation of the valve stem 23 and hence of the control valve 2 without disturbing the setting of the air valve. It will be apparent also that when the key is restored to its former position the valve 2 must be restored to its original setting, so that the relative positions of the air and oil valves have been unchanged.

Obviously, therefore, this construction is such that by moving the knob 26 inwardly on the valve stem 23 the setting of the valve 2 may be varied without in any way affecting the setting of the air valve 1.

The control valve 2, as above mentioned, is of novel construction in other respects. As will be seen from Figs. 2 and 4 the valve is bored lengthwise to provide a port 29 in line with pipe 14. This port is intercepted by another port 30 bored through the side of the valve, this port being adapted to be placed in communication with the port 31 leading to the port 15 already referred to.

The face of the valve 2 at the outer end of the port 30 is provided with triangular cuts or kerfs 32 and 33, the base of each cut being at the port. This permits of a freer flow of the oil through the valve into the port 31 when the valve is not full open, than when the face of the valve is constructed in the usual way, i. e., merely provided with a circular port 29. It also permits of a better cut off in closing the valve and will to a great extent, I believe, reduce blocking of the line due to dirt that may be in the oil.

It will be appreciated from all of the foregoing that I have provided an oil burner apparatus in which the valve mechanism is of new and novel construction, the invention providing, as above noted, for proper setting of the air valve and oil control valve initially, simultaneous operation of these two valves to close off the air and oil when the burner is to be shut down, and independent manual adjustment of the oil control valve when the mixture of oil and air supplied to the burner is to be varied as, for example, in starting operation, being provided for.

It is to be understood that changes may be made in the details of construction above described within the purview of my invention.

What I claim is:—

1. Oil burning apparatus comprising in combination an air valve, an arm connected to said air valve, an oil valve, a stem therefor, means slidable along said valve stem into engagement with said arm for connecting the valve stem to said arm for simultaneously adusting both valves, said means when moved along said stem out of engagement with said arm permitting rotation of the valve stem for independently adjusting said oil valve with respect to the air valve and independently of said arm.

2. Oil burning apparatus comprising in combination an oil valve, a stem for said oil valve, a key carried by said stem, an air valve, an arm connected thereto, said arm being cooperable with said key so that movement of the arm rotates said oil valve and air valve simultaneously, and means for sliding said key along said stem to disconnect the air valve therefrom for independently adjusting said oil valve, return movement of the key returning the oil valve to its original setting.

3. Oil burning apparatus comprising in combination an air valve, an oil valve, a longitudinal stem for said oil valve, a key mounted in said stem for relative longitudinal movement, said key being adapted to adjust said air valve and oil valve simultaneously upon rotation in normal position on said stem and to adjust said oil valve independently of said air valve when advanced on said stem out of normal position.

4. Oil burning apparatus comprising in combination a pivoted air valve, a rotary ported oil valve having a triangular kerf at the discharge end of said port, the base of said kerf being at the port, means providing a cooperating fixed port, a stem for said oil valve and means carried by said stem for connecting said air valve thereto for simultaneously pivoting the air valve and rotating the oil valve including the kerfed port relatively to said fixed port upon rotation of said last mentioned means, said last mentioned means being movable longitudinally on said stem for disconnecting said air valve to permit of rotation of said oil valve with the air valve stationary.

5. Oil burning apparatus comprising in combination an air valve, an oil valve connected thereto, a stem for said oil valve, means mounted on said stem and slidable thereon to momentarily disconnect the oil valve from the air valve to permit the oil valve to be adjusted independently of the air valve, and means for preventing again connecting the oil valve and air valve until said valves have been returned to their original relative settings.

6. Oil burning apparatus comprising in combination an air valve, an oil valve, an arm connected to said air valve for varying the setting of the oil valve, means slidable longitudinally on the stem of said oil valve to disconnect the oil valve from said arm, to permit of adjustment of the oil valve relatively to the air valve, and means for preventing again connecting the oil valve and air valve until said valves have been returned to their original relative settings.

RALPH S. WHALEY.