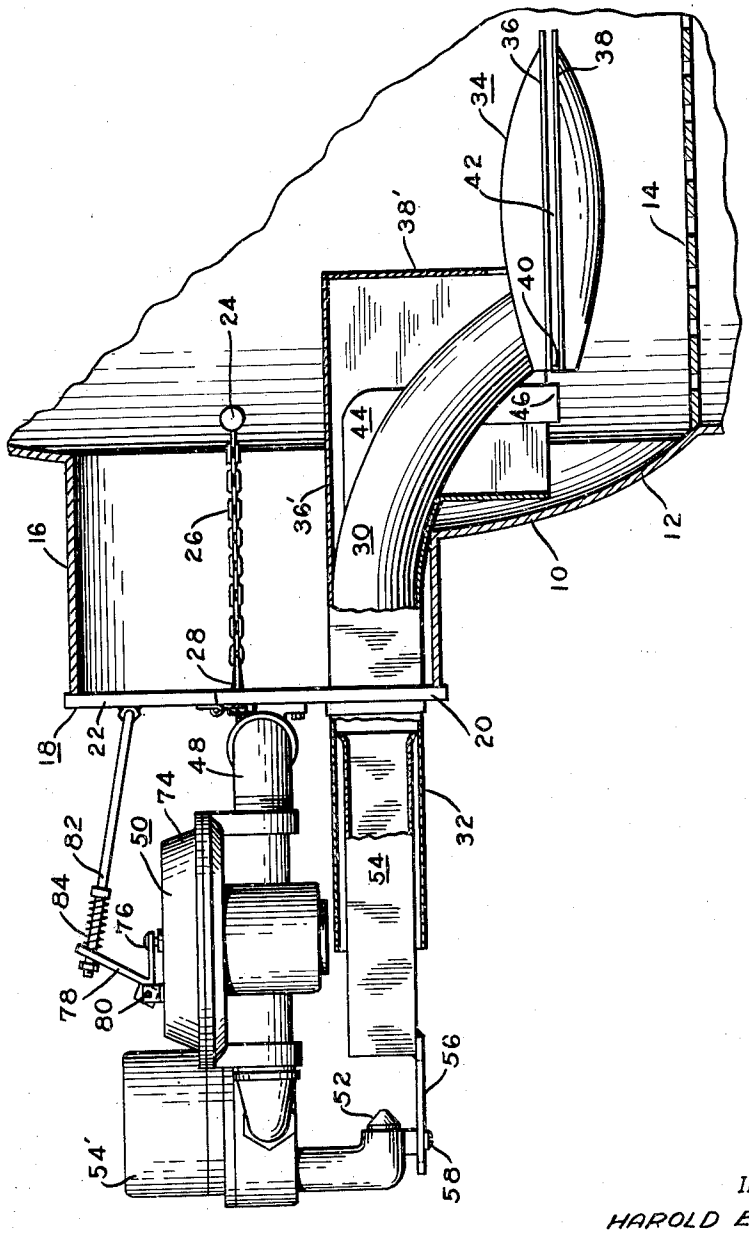
Dec. 6, 1949 H. E. HANDLEY 2,490,127

MOUNT FOR GAS BURNERS

Filed Aug. 30, 1946 2 Sheets-Sheet 1

FIG. 1



INVENTOR.
HAROLD E. HANDLEY
BY
Barnes, Kisselle, Laughlin & Rausch
ATTORNEYS

Dec. 6, 1949 H. E. HANDLEY 2,490,127

MOUNT FOR GAS BURNERS

Filed Aug. 30, 1946 2 Sheets-Sheet 2

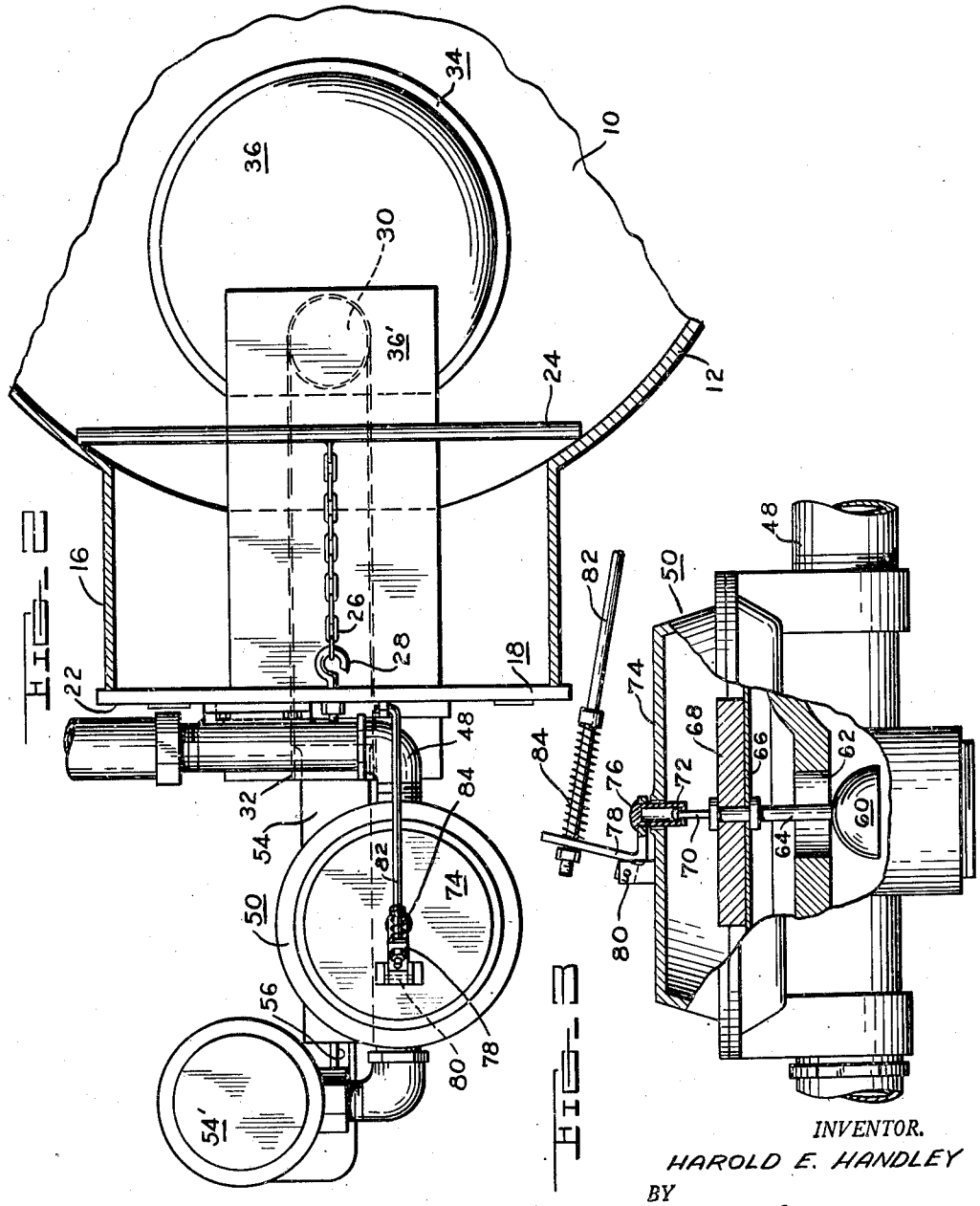


FIG. 2

FIG. 3

INVENTOR.
HAROLD E. HANDLEY
BY
Barnes, Kisselle, Laughlin & Raisch
ATTORNEYS

Patented Dec. 6, 1949 2,490,127

UNITED STATES PATENT OFFICE

2,490,127

MOUNT FOR GAS BURNERS

Harold E. Handley, Jackson, Mich.

Application August 30, 1946, Serial No. 694,076

2 Claims. (Cl. 158—2)

1

This invention relates to a mount for gas burners for use in heating plants. In my patent No. 2,295,784 I have disclosed a burner particularly adapted for use during the early and late part of the heating season which may be readily inserted in and removed from the door of an ordinary coal burning furnace.

Specifically, it is an object of the invention to reduce the cost of the burner head and of the mounting arrangements and the control devices.

Other features and objects of the invention have to do with the details of construction and operation which will be set forth in the following specifications and claims.

Figure 1 is a vertical sectional view of a burner in place in a furnace and embodying a preferred form of the present invention.

Figure 2 is a top view of the burner in place.

Figure 3 is a view partly in section of an improved pressure regulator and shut-off valve forming part of the burner assembly.

Referring to the drawings, in Figure 1 there is shown a furnace 10 comprising the fire pot 12, grate 14 and fuel door opening 16. The burner assembly, generally designated 18, mounts on a plate 20 having a horizontally pivoted upper section 22. The plates 20 and 22 abut the door opening and the unit is held in position by a door holder rod 24 which is somewhat longer than the width of the fuel door opening 16. A chain 26 is secured to the rod 24 and has a screw-eye 28 by which the mounting plate 20 may be tightly clamped in the position illustrated. Slidably secured to the closure plate 20 is the curved circular mixture tube 30, the left-hand end of which projects somewhat outside the door in a straight section 32 and the right-hand end of which carries the burner head 34. Surrounding the mixture tube 30 is a secondary air duct 36' of rectangular form which has a distribution box 38' by which secondary air is directed downwardly into the zone around the burner head 34.

The burner head 34 comprises two identical shell-shaped stampings 36 and 38 which are joined together by a straight connector piece 40 at the left-hand edge. This provides a narrow circumferential slot 42 through which gas and air are delivered for combustion. The automatic pilot tube 44 is also mounted on the door plate 20 within the secondary air duct 36' and has a downwardly extending tip 46 adjacent the burner head 34. Mounted on the door plate 20 is a gas inlet 48 which may be connected to a gas supply by a suitable conduit. The gas inlet feeds an

2

automatic pressure control valve 50 which serves to maintain a constant outlet pressure and feeds the gas orifice 52 through the automatic on-off valve 54'. The latter is controlled from the room thermostat in the usual manner. Slidably mounted in the mixture tube end 32 is a telescoping mixer tube 54 having a slotted bracket 56 welded to the end thereof and cooperating with a set screw 58 on the bottom of the gas orifice fixture 52. The mixer tube 54 may be moved toward and away from the orifice 52 and because of the relatively large diameter of the orifice fixture, the primary air opening at the end of mixer tube 54 may be controlled by the proximity of the fixture 52 to the end of tube 54.

The gas regulator valve 50 is illustrated in detail in Figure 3 from which it will be seen that the valve 60 cooperates with the seat 62 to open or close communication with the inlet at the right and the outlet at the left. The valve stem 64 is connected to a flexible diaphragm 66 and carries a weight 68. The diaphragm is thus responsive to the pressure above the seat 62 which is outlet pressure and has a normal fluctuation which serves to adjust the valve 60 to whatever position is required to maintain the outlet pressure constant.

For the purpose of providing manually controlled shut-off of gas, the stem 64 is provided with a headed upward extension 70 which is surrounded by a small tube 72 slidable in the cover 74. The tube 72 has a shoulder beneath the head of extension 70 and has a head 76 at its top. A bell-crank lever 78 is pivoted at 80 on the cover 74 and is connected for manual actuation by a rod 82 which is pivotally connected to the door section 22. A suitable spring and collar arrangement at 84 provides a yielding connection to permit further movement of rod 82 after valve 60 is tightly engaged with the seat 62. For further disclosure of the details of the various elements of the burner such as the automatic pilot and thermostatic control circuit, reference may be had to my above mentioned prior patent.

In operation, it will be seen that when the unit is to be inserted in the furnace, the screw-eye 28 will be removed from the stationary door plate 20 and the entire assembly inserted through the fire door opening 16 to position the plate 20 as shown. The access door 22 may be opened and the rod 24 and chain 26 placed in position and the screw-eye 28 tightened to clamp the unit in place.

While the door 22 is open, the gas supply is shut off by reason of the rod 82 having rotated

the bell-crank 78 counterclockwise to close the valve 60. After the unit is secured in position, the pilot burner 46 may be lighted and the access door 22 closed. If the room thermostat is calling for heat this will open the automatic control valve 54' so that gas is now delivered to the orifice 52 because both valves 50 and 54' are open. The mixture is accordingly delivered to the burner head 34 where it is ignited by the pilot flame.

The flame produced by the burner head disclosed wipes the side walls of the combustion chamber and exchanges heat from the bottom up. With the horizontal gas burning port, flames and hot gases are naturally sent in this direction since they are projected toward the side walls and the natural tendency is for them to rise. In addition, the ineffective heating surface at the front of the fire pot below the fire door is not scrubbed with either flames or hot gases since in most furnaces there is little heating surface at this point. In the present construction, secondary air is introduced at this point and passes downwardly beneath the burner head 34 so that it may be introduced under the flame to assure proper aeration. It has been found that a much more stable combustion and higher efficiency are produced by this construction. Furthermore, the burner operates over a much wider range of inputs and one size burner can cover the range previously requiring two different sizes of burner.

The telescoping mixing tube 54 provides a convenient adjustment for the primary air volume and also one which is not readily clogged by collection of lint. It furthermore makes adjustment for different depths of fire door construction more convenient.

It will thus be seen that the present invention provides a simple, low-cost construction in which more convenient attachment of the unit is possible and which produces higher efficiency of operation and more reliable controls.

In addition, the sliding and telescoping mounting of the mixture tube on the mounting door, and of the secondary air duct and pilot tube as well, permit ready adjustment of the burner head at any required distance from the mounting door thus adapting the unit to furnaces of different sizes and depths of fuel door opening. Furthermore, such adjustment in no way disturbs the permanent position of the controls and gas inlet mounted on the outside of the door and thus adapts them to standardized roughing-in dimensions based on the position of the normal fire door.

I claim:

1. A mount for a gas burner assembly to be used in connection with the fire box and fuel opening of a building heating unit including an auxiliary closure member for the fuel opening of said heating unit which comprises a stationary portion for supporting a gas heating unit adapted to be temporarily and removably mounted in said fuel opening, a movable door portion adapted to permit access to the interior of said heating unit, an elongate member having a length substantially equal to the width of the closure member and insertable through the fuel opening to a position inside the fire box and extending across said opening, and a tension member of adjustable length extending between said elongate member and closure.

2. A mount for a gas burner assembly to be used in connection with the fire box and fuel opening of a building heating unit including an auxiliary closure member for the fuel opening of said heating unit which comprises a stationary portion for supporting a gas heating unit adapted to be temporarily and removably mounted in said fuel opening, a movable door portion adapted to permit access to the interior of said heating unit, an elongate member having a length substantially equal to the width of the closure member and insertable through the fuel opening to a position inside the fire box and extending across said opening, and a tension member of adjustable length comprising a screw-eye mounted in the closure and a chain extending between said elongate member and screw-eye.

HAROLD E. HANDLEY.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
382,510	Carrico	May 8, 1888
440,929	Stirling	Nov. 18, 1890
1,424,739	Reeves	Aug. 1, 1922
1,513,260	Mooring	Oct. 28, 1924
1,675,133	Rayfield	June 26, 1928
1,780,896	Anderson	Nov. 11, 1930
1,887,150	Torney	Nov. 8, 1932
1,921,152	Caldwell	Aug. 8, 1933
1,986,311	White	Jan. 1, 1935
2,070,535	Hansen	Feb. 9, 1937
2,131,221	Crary	Sept. 27, 1938
2,178,703	Robbins	Nov. 7, 1939
2,183,836	Gordon	Dec. 19, 1939
2,200,264	Dennis et al.	May 14, 1940
2,215,983	Smith	Sept. 24, 1940
2,295,784	Handley	Sept. 15, 1942
2,297,856	Ames	Oct. 6, 1942