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AUTOMATIC CUT-OFF FOR GAS BURNERS

Filed Aug. 18, 1928

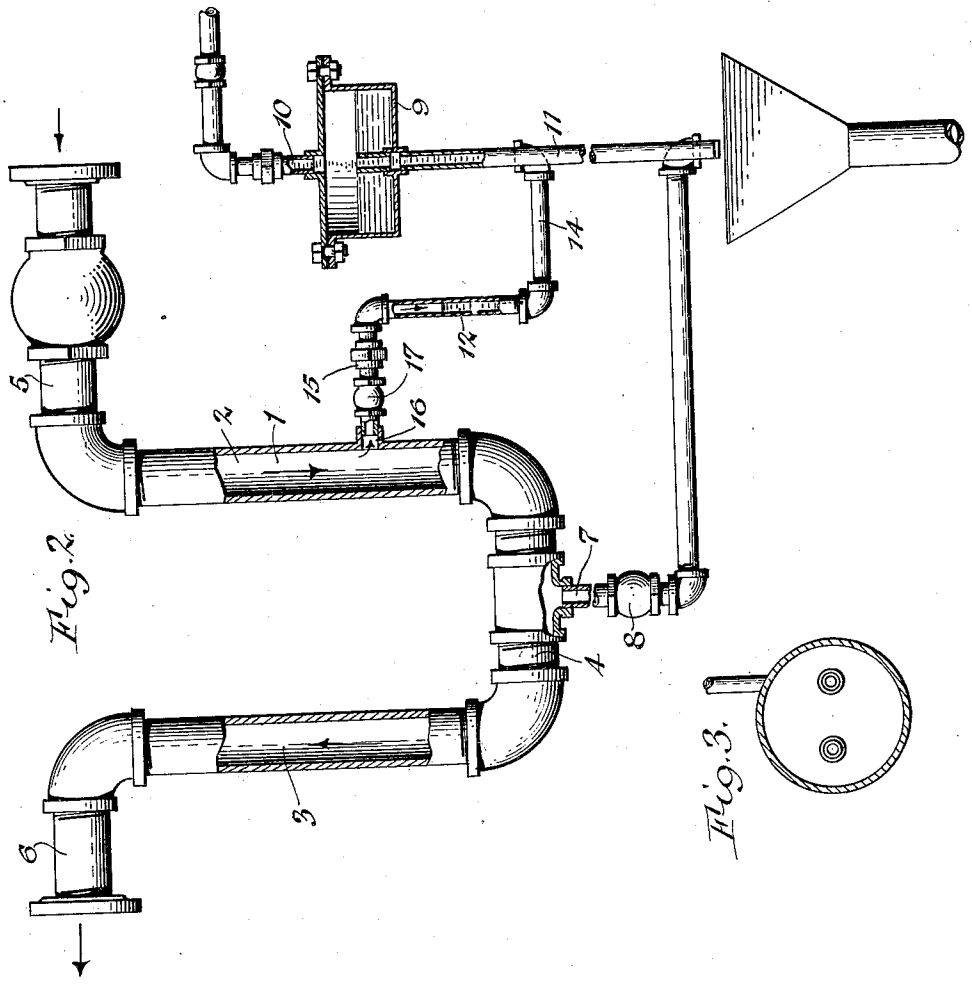


Fig. 2.

Fig. 3.

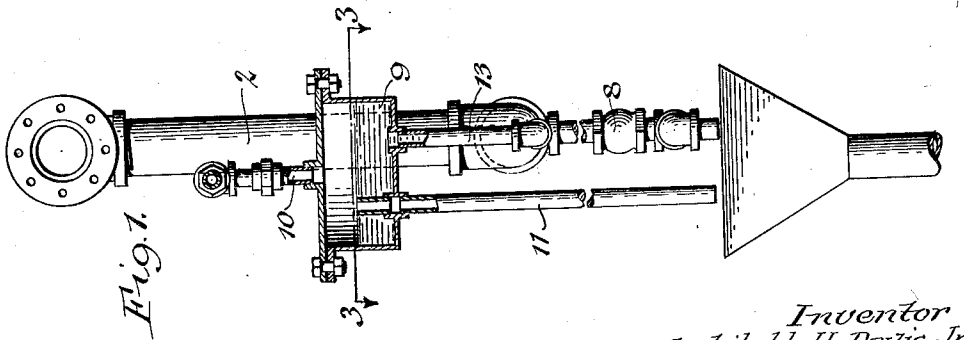


Fig. 1.

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UNITED STATES PATENT OFFICE

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AUTOMATIC CUT-OFF FOR GAS BURNERS

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This invention relates to an automatic cut-off for gas burners, and comprises a means whereby the flow of gas is completely arrested when the pressure in the gas line falls below a predetermined minimum and a means whereby resumption of the flow of gas is thereafter prevented.

In the operation of a gas fired furnace it sometimes happens that the pressure in the gas main fails, thereby causing a cessation in the flow of gas to the gas burned whereupon the flame is extinguished. When the flow of gas is again resumed the fire box of the furnace becomes filled with an explosive mixture of gas and air. If an operator, unaware that gas has been flowing, attempts to relight the burner under such circumstances, an explosion of the gas mixture in the furnace may occur with consequent damage. In the type of furnace having a draft only when gas is burning, a further hazard arises in the danger of explosion in the room under the above circumstances, due to the gas escaping into the room.

One object of the present invention contemplates the elimination of the hazard of explosion in the operation of a gas fired furnace, due to failure of pressure in the gas main. A further object contemplates a simple and efficient means having no relatively moving parts, whereby the feed to the gas burner is completely obstructed when the pressure in the gas main falls below a predetermined minimum and a means to thereafter prevent resumption of the gas flow until the obstruction is manually removed.

These and other objects will be readily apparent from a consideration of the following specification taken in connection with the drawings wherein is disclosed a preferred embodiment of the invention and wherein

Fig. 1 is a view partly in section,

Fig. 2 is a side view of Fig. 1 partly in section,

Fig. 3 is a section of line 3—3 of Fig. 1.

Referring to the drawing, a U-shaped member or trap 1 is interposed between the burner and the gas supply main and consists of the hollow vertical sections 2 and 3 and a horizontal section 4 joining the two vertical sections at their bottoms. Gas enters the member at 5, passes through the sections 2, 3, and 4 and through pipe 6 to the burner (not shown). A pipe or drain 7 in the lower horizontal section 4 communicates with the interior of the U-member and is normally closed by the valve 8.

Adjacent to the U-shaped member is a manometer device consisting of a tank or receptacle 9 into which water is introduced through 10 and discharged through a constant level overflow 11. Extending downwardly from the bottom of the receptacle 9 is the U-shaped section of the manometer consisting of legs 12, 13, a horizontal section 14 joining the two legs at the bottom, and a connecting arm 15 having the valve 17, joining the leg 12 and manometer to the leg 2 of the U-shaped member at 16.

In operation, gas from the main line passes into the U-shaped member through 5, through vertical leg 2, through horizontal section 4, through vertical leg 3, and leaves through pipe 6 to the gas burner. The manometer device contains water at a predetermined constant level. When the pressure in the gas line is above a predetermined minimum, some gas will enter the connecting arm 15 and the vertical leg 12, forcing back the water in leg 12. The height of the water in leg 12 will therefore depend solely upon the pressure in the gas main. As the pressure in the gas main diminishes, the column of water in leg 12 will rise until the minimum gas pressure permissible has been reached whereupon the water will flow through connecting arm 15 into the vertical leg 2 at 17 and will flood the U-bend up to the point 17, thus effectively shutting off the supply of gas to the burner. Before communication with the burner can be reestablished, it will be necessary to drain the water out of the U-member through the pipe 7 by closing the valve 16 and opening the valve 8. When the water has been drained out of the U-member 1, communication between the gas main and burner will be automatically reestablished. Valve 8 is now closed to prevent the escape of gas through drain 7, and valve 16 is opened permitting the gas pressure to force the wa-

ter back in leg 12, where it will be held until the gas pressure again drops below the minimum value permissible. The apparatus is now ready for operation.

While I have shown and described the preferred embodiment of the invention, therein a U-bend is formed in the gas line, I wish it to be understood that the shape of this member is not material and that the only requirement as to the form of this member is that there shall be an offset or a pocket formed in the gas line which will completely obstruct the gas flow when filled with a liquid. The length of the legs 2 and 3 of the U-shaped member will be such that when it is flooded, the gas pressure in leg 2 will not be strong enough to force the liquid up through leg 3 and into exit pipe 6 leading to the burner. The particular form of the manometer also is not material, it being necessary only that there be a source of liquid under constant pressure operated by changing pressure in the gas main to introduce said liquid into the main. Other changes in the construction of details of the invention will be readily apparent to those skilled in the art. The invention is not to be limited except as defined in the following claim.

I claim:

In an apparatus of the character described, the combination comprising a gas conduit having a U-shaped portion, a manometer having one end communicating with one leg of the U at a point substantially above the base of the U, a reservoir in communication with the other end of the manometer, and an overflow pipe to maintain a constant level of liquid in said reservoir.

In testimony whereof I affix my signature.

ARCHIBALD H. DAVIS, JR.