IGNITION DEVICE FOR GAS APPARATUS, PARTICULARLY FOR GAS WATER HEATERS WITH ENCLOSURE COMBUSTION CHAMBER

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This invention relates to an ignition device for gas apparatus and more particularly is concerned with such a device to be used in gas water heaters having a combustion chamber that is enclosed with respect to the room of installation.

It is known in the art, with such apparatus to arrange the pilot flame burner in a separate chamber which is in communication with both the combustion chamber and the room of installation, these communications being realized each by an opening that can be closed by means of a hinged cover. In the well known arrangement of parts and components constituting such a system, the hinged covers are coupled with each other by means of a control lever in such a manner that the one cover automatically closes when the other cover is opened. Such an arrangement, it is true, offers considerable advantages over ignition devices which effect the ignition from the outside through the closed wall of the combustion chamber, but on the other hand, there is the disadvantage during the opening and closing process of the hinged covers that a direct communication between the combustion chamber and the room of installation is established when the hinged covers are in their intermediate position. Since normally there exists a pressure drop between the room of installation and the combustion chamber, the pilot flame will in many cases be extinguished by the draft which is formed due to the pressure gradient existing.

The invention has therefore for its object to provide an ignition trap for such apparatus with enclosed combustion chamber that is reliable in operation and thereby to eliminate the known disadvantage described above.

The invention starts out from an ignition burner chamber provided with openings that can be closed. In accordance with the present invention, the parts and components constituting such a system are so arranged that the one of the openings is positively closed before the passage is admitted through the other opening. Although such a trapping action may also be realized by suitably designing the coupling members, the object of the invention may be advantageously achieved thereby that the ignition burner is located in a housing that can be attached to the apparatus and has an opening to establish communication with the housing and the room of installation and also comprises another opening offset with respect to the first one and establishing the communication between the housing and the combustion chamber. A slide to be operated from the outside is guided in the housing and opens in its one end position one of the openings and admits passage through the other of the openings when in its other end position. The slide may be movable in axial direction or can be designed as a rotary slide. If now this slide is under the influence of a spring catch and consequently snaps from the one end position into the other when operated, sufficient precaution is taken so that the pilot flame cannot be extinguished due to lack of air, as it is impossible for the slide to remain for any length of time in an intermediate position where both of the openings are closed.
causes the slide 9 to snap into its other end position by the interaction of the double-cone surface 12 and the click-stop ball 11. The effect of this action is that the openings 6, 7 of the housing 3 are closed by the slide 9 before the opening 16 begins to establish communication with the housing. All openings of the housing 6, 7 and 8 are covered by the slide 9 when in an intermediate position in which the slide cannot remain due to the click-stop device 11, 12. Simultaneously with freeing the opening 8, the ignition gas valve 19 is pushed open by the edge 20 of slide 9, so that now a greater pilot flame 24 results which protrudes through the openings 8, 16 into the combustion chamber 2 and ensures a safe ignition of the burner.

I claim:

1. An ignition device for a gas water heater having a combustion chamber enclosed from the installation room atmosphere, comprising a housing adapted for attachment to the wall of the combustion chamber and arranged to form an ignition chamber and having a gas-fueled ignition burner fixedly positioned therein, said housing being provided with a passage for connection with the combustion chamber at an opening in a wall thereof and with a passage for connection with the installation room atmosphere; and a slide valve comprising a hollow elongated slide member guided in said ignition chamber and capable of being operated from the exterior of the housing, said slide member having transverse passages therein positioned to connect the ignition chamber to the combustion chamber when the slide member is at one of its terminal positions, and to disconnect the ignition chamber with the installation room atmosphere when the slide member is at the other of its terminal positions, said slide valve completely closing each housing passage before the other is opened, whereby a continuous passage from the installation room atmosphere through the ignition chamber to the combustion chamber is prevented.

2. An ignition device according to claim 1 wherein said ignition chamber housing is provided with an additional passage for communication with the installation room atmosphere and said slide member is provided with an additional transverse passage for cooperating with said additional ignition chamber housing passage, all of said passages being so arranged that said ignition chamber housing passages are closed by said slide valve prior to the opening of the passage connecting said ignition chamber with said combustion chamber.

3. An ignition device according to claim 1 wherein a click-stop device is provided for maintaining said slide valve normally at rest at either one of its terminal positions.

4. An ignition device according to claim 1 wherein said slide valve is mounted non-rotatably and axially movable in said housing and is provided on either end with keys projecting axially beyond said housing.

5. An ignition device according to claim 1 and including an ignition burner gas valve mounted in the ignition chamber housing and having a valve operating member projecting into the interior of the ignition chamber and so positioned that movement of the slide member a small distance away from its terminal position wherein said ignition chamber is open to the room atmosphere causes said slide member to engage and depress said valve operating member and open said ignition burner gas valve.

6. An ignition device according to claim 1 wherein said ignition burner is directed to throw a flame toward said combustion chamber opening, and including a secondary ignition burner gas valve mounted in the ignition chamber housing and having a valve operating member projecting into the interior of the ignition chamber for supplying a supplemental gas flow to the ignition burner, said valve operating member being so positioned that when said slide member reaches its terminal position wherein said ignition chamber is open to said combustion chamber said slide member engages and depresses said valve operating member to open said secondary ignition burner gas valve, whereby an enlarged flame is directed from the ignition burner into the combustion chamber.

7. An ignition device according to claim 1 wherein said ignition burner is directed to throw a flame toward said combustion chamber opening and including a pair of ignition burner gas valves mounted in the ignition chamber housing, each valve having a valve operating member projecting into the interior of the ignition chamber housing, said valve operating members being spaced and so positioned that a small movement of said slide member away from its terminal position wherein said ignition chamber is open to the room atmosphere causes said slide member to engage and depress one of said valve operating members to open one of said ignition burner gas valves and continued movement of said slide member to its opposite terminal position causes said slide member to engage and depress the other valve operating member to open the other valve whereby an enlarged flame is directed from the ignition burner into the combustion chamber.

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