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[54] **CENTRAL HEATING BOILER**
11 Claims, 1 Drawing Fig.

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122/33, 122/156, 431/156
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122/22, 33, 30, 156

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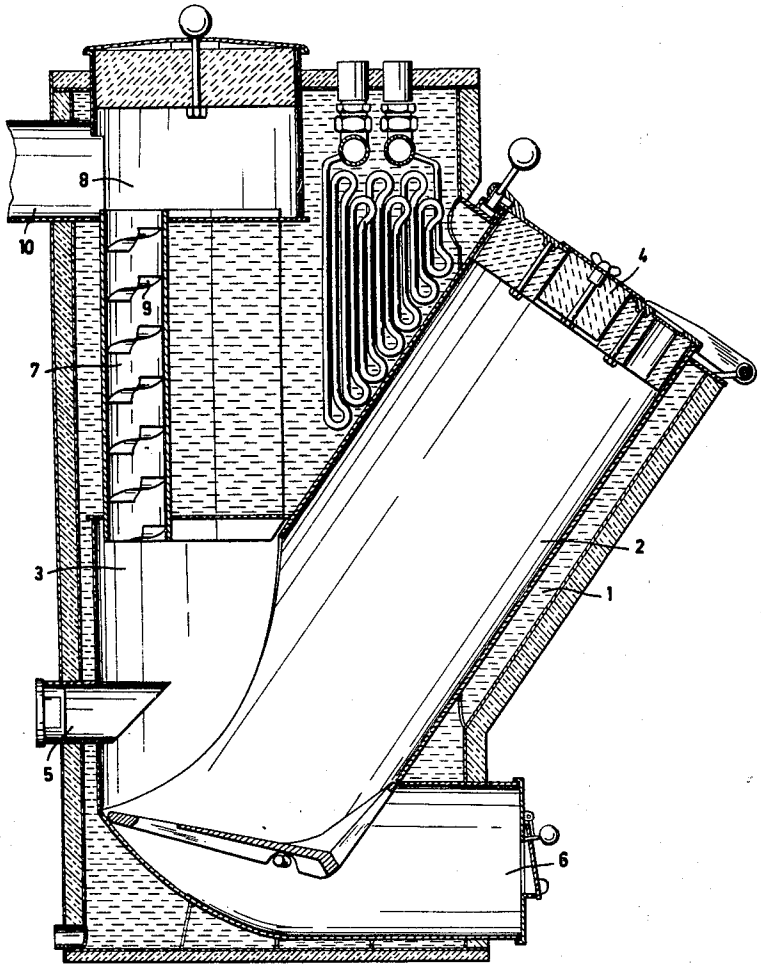
ABSTRACT: Central heating boiler for alternatively utilizing a solid fuel, such as wood and a fluid fuel, such as oil having a vertically disposed tube and an obliquely disposed tube intersecting therewith with the obliquely disposed tube being at an angle greater than the gliding angle so as to automatically feed such fuel toward the intersection for burning and provided with means for mounting a fluid fuel burner for projecting a flame downwardly within the oblique tube.



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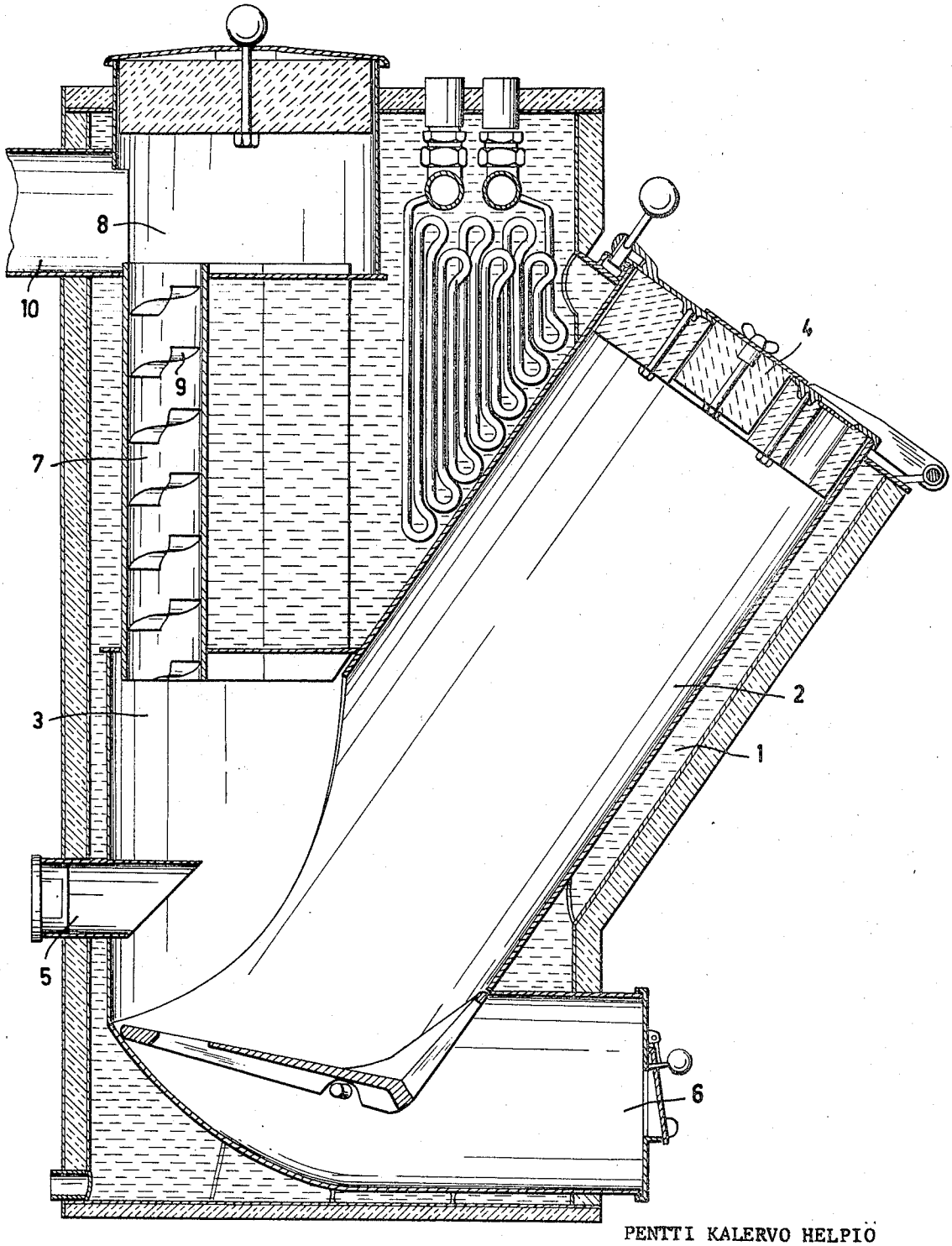

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CENTRAL HEATING BOILER

This invention relates to a central heating boiler in which both oil and wood can be employed as fuel.

It has been uneconomical and difficult to employ firewood and combustible oil as alternating fuels in central heating boilers, especially small ones, being in use up till now because the efficiency is bad if only one fuel or the other is employed, and besides the burning time of one fuel charge is short if wood is employed. These disadvantages cause fuel losses. Besides, the heating is troublesome and the temperature of the heated rooms becomes inconstant.

The purpose of this invention is to avoid the aforementioned disadvantages. The invention is primarily characterized by the fact that the oil burner combustion chamber is arranged in the boiler at an inclination at least corresponding to the gliding angle of wood and that this combustion chamber in its lower portion communicates with a preferably vertical space which is in communication with an outlet for combustion gases and which is arranged, during heating with wood and when the oil burner combustion chamber is functioning as a wood storage to function as a combustion chamber for a low-burning boiler.

A cylindrical space is arranged in communication with the lower portion of the combustion chamber from which the convection tubes extend to a collecting chamber for combustion gases and further on to the gas outlet.

When combustible oil is employed as fuel, whereby the burner is mounted on the boiler cover, the inclined burning space functions as combustion chamber. When wood is employed, it functions as a fuel storage from which the fuel glides to the lower portion of the storage in proportion as the burning advances. The boiler can be fired with wood even without grate. Due to the inclined burning space which preferably has a cylindrical form, especially good burning conditions are achieved when the boiler is employed with oil, because explicitly a cylinder corresponds to the form of the flame of an oil burner, and its length makes it possible to change the size of the nozzle according to the different seasons in such a way that the peaks of the flame do not touch the bottom of the combustion chamber, which could result in the formation of soot.

When wood is employed, the charges become big enough so that a sufficient burning time is achieved. The convection tubes are provided with movable and detachable screw-formed guides for combustion gases, which improve the heat transfer in the convection portion, and, at the same time, the soot and the flue dust having possibly adhered to the convection tubes can be removed. Besides, by removing some of the screw guides the boiler draft can be improved when external draft conditions are bad. This is particularly important in modern low-design buildings with a short chimney.

The nature of this invention and its further advantages will become clear from consideration of the following specification taken in conjunction with the accompanying drawing showing a sectional view of one embodiment of the present invention.

The embodiment of the invention according to the drawing is provided with a cylindrical combustion chamber **2**. An oil burner (not shown) can be arranged on the cover **4** of the inclined chamber **2**, or fuel storage respectively, wherefrom it is easily removable when wood firing is to be employed. In the lower portion of said cylindrical combustion chamber **2** (fuel storage) there is a second cylindrical space **3** arranged which functions as a combustion chamber when fired with wood. Secondary air is passed into the space **3** through a valve **5**. The convection tubes **7** and their guides **9** are arranged in the upper bottom portion, of the space **3**, and they extend to a smoke collecting chamber **8**. From the smoke collecting chamber **8** the combustion gases escape into a smoke outlet **10**. The smoke collecting chamber **8** is provided with a heat-insulated cover which is easy to open so that the combustion gas guides **9** can be reached.

In the lower portion of the boiler there is a primary air tube **6** for wood firing. The purpose of the tube is to function as a soot removing tube. In the upper portion of the boiler there is a copper tube battery for the heating of household water.

I claim:

1. Central heating boiler in which both oil and wood can be employed as fuel, characterized in that the oil burner combustion chamber is arranged in the boiler at an inclination at least corresponding to the gliding angle of wood and that this combustion chamber in its lower portion communicates with a preferably vertical space which is in communication with an outlet for combustion gases and which is arranged, during heating with wood and when the oil burner combustion chamber is functioning as a wood storage to function as a combustion chamber for a low-burning boiler.

2. Central heating boiler according to claim **1**, characterized in that the oil burner combustion chamber is made so long that the flame of the oil burner, even at full power, does not touch the bottom of the combustion chamber.

3. Central heating boiler according to claim **1**, characterized in that the convection tubes are provided with screw-formed combustion gas guide means for the control of the draft conditions, which guide means are detachable and the number of which can be increased and decreased.

4. Central heating furnace comprising, in combination, a pair of intersecting elongated combustion tubes disposed generally angularly relative to one another in a generally vertically disposed plane, one of said pair of combustion tubes extending generally vertically upwardly of the intersection therebetween defining a combustion chamber for burning of solid fuel fed thereinto through the other of said tubes, said other of said tubes being inclined at an angle at least as great as the gliding angle of the fuel so that fuel inserted therein may automatically advance into said one tube as the lower end portions thereof are consumed.

5. Furnace defined in claim **4** further comprising a cover movably mounted with the upper end portion of said other of said tubes so that solid fuel may be inserted therein and means for mounting a fluid fuel burner with the upper end of said other of said tubes for projecting a flame generally axially downwardly within said other tube wherein said other tube is of sufficient length that the peaks of the flame extend past said intersection and into said one of said tubes.

6. Furnace defined in claim **5** further comprising a grate extending across the lower end portions of said tubes generally beneath said intersection for supporting the burning ends of such solid fuel extending down said other of said tubes and a primary air tube extending generally horizontally outwardly of said intersection at least partially beneath said grate for enabling combustion air to flow into said intersection and for enabling soot, ashes, and combustion residues to be removed therefrom.

7. Furnace defined in claim **6** further comprising a secondary air valve extending generally horizontally into said one of said tubes generally opposite said intersection at a location above said grate.

8. Furnace defined in claim **5** wherein each of said tubes is of generally circular cross-sectional configuration.

9. Furnace defined in claim **5** wherein said one of said tubes terminates at the upward end thereof substantially at the level of the upper end of said intersection, said furnace further comprising jacket means substantially completely surrounding said tubes for containing a heat transfer fluid to receive the heat of combustion therefrom and at least one convection tube extending upwardly of said one of said tubes for exhausting the combustion gases therefrom.

10. Furnace defined in claim **9** wherein said convection tube is disposed generally vertically and comprises a plurality of screw-forming combustion-gas guides removably disposed within said convection tubes for rotating and swirling the combustion gases, and further comprising a smoke-collecting chamber extending generally upwardly of said convection tube and a cover for said smoke-collecting chamber movably

disposed opposite said convection tubes for enabling access to said smoke collecting chamber, convection tubes and screw forming combustion gas guide.

11. Furnace defined in claim 10 further comprising a grate extending across the lower end portion of said one and said other of said tubes generally beneath said intersection for supporting solid fuel, a primary air tube extending generally horizontally outwardly of said intersection at least partially beneath said grate for enabling combustion air to flow into the intersection and for enabling soot, ashes and residue to be removed therefrom and a secondary air valve extending generally horizontally into said one of said tubes generally opposite said intersection and above said grate and wherein each of said tubes is of generally circular cross-sectional configuration.