

1,058,190.

The drawing consists of two parts: Fig. 1 and Fig. 2.

Fig. 1 is a side cross-sectional view of a mechanical device, possibly a gas burner or heater. It features a main vertical chamber (5) and a lower gas inlet section (2). A gas inlet pipe (0) leads into the lower section. A gas valve (8) is located on the right side, with a label "Gas" below it. A gas burner assembly (7) is positioned at the bottom of the chamber. A vertical pipe (4) with a coiled internal structure (c) extends from the burner area up to the top of the chamber. A horizontal pipe (12) is connected to the top of the chamber. A vertical pipe (15) is also shown. A lever mechanism (16, 17) is attached to the top of the chamber. A label "H" is on the left side, and "C" is on the right side. Other labels include 3, 14, 18, 9, 1, 10, and n.

Fig. 2 is a top-down view of the device, showing a circular component (8) with a central hub (d) and a radial structure. The label "Fig. 2" is to the left of the circular component.

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CHARLES A. MCGINNIS, OF CLEVELAND, OHIO.

CONVERTIBLE GAS AND HOT-FLUE WATER-HEATER.

1,058,190.

Specification of Letters Patent.

Patented Apr. 8, 1913.

Application filed March 11, 1912. Serial No. 683,057.

To all whom it may concern:

Be it known that I, CHARLES A. MCGINNIS, citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Convertible Gas and Hot-Flue Water-Heaters, of which the following is a specification.

My invention has reference to a convertible gas and hot flue water heater, and the object of the invention is to provide a heater or device for heating water which is adapted to be placed in the exhaust flue or pipe leading from a heating furnace, range or stove to the usual exit in a chimney and heating the water by the products of combustion flowing from such a source and in case such source of heat be cut off or unavailable at any time to provide for heating the water by a burner specially provided in the system for such conditions. For example, suppose the heater to be arranged in the discharge flue or pipe from the usual furnace in the basement of a dwelling and the heater to be arranged in such flue or pipe. There comes a time when the furnace may be running low or is entirely out, as in summer. In that case there could be no heating of water in the said heater without a special burner, and I have therefore equipped the said draft flue with supplement heating means, which in this instance is a gas burner arranged in or just beneath the upright portion of said flue and under the heater proper, so that when the fire dies down or goes out in the furnace the gas burner can be turned on to do the required work. This makes the complete device convertible and it is especially advantageous from an economical view point in these northern latitudes where furnace fires have to be maintained for at least six months in the year. The same principle of construction and arrangement applies generally in heating and cooking stoves. Obviously, also the two methods of heating may be employed conjointly as well as separately.

Referring now to the accompanying drawings, Figure 1 is a sectional view of my improved heating device, and Fig. 2 is a bottom view of the damper and cap which I use at the bottom of the main vertical flue.

In the drawing pipe 2 represents a direct flue from a furnace or other heater H and the parallel pipe 3 a working continuation thereof with a probable discharge into a

chimney C. Between the said two horizontal portions 2 and 3 I provide two vertical flue connections, of which the connection, pipe or flue 4 is the main flue or connection, and 5 is the by-pass or high draft flue, passage or channel. A water-heating coil *c* is placed lengthwise in the main vertical flue 4 and in this instance occupies the entire length thereof and is preferably fashioned with somewhat contracted coils in what may be termed its neck *n* and at the point where the products of combustion first strike the same in their approach through flue 2 so as to facilitate rather than impede the draft at this point. Otherwise the said coil has the same relative width at both ends and gradually widens from its narrowest portion toward both ends, particularly toward the top, where the larger area of pipe thus exposed proportionally increases the heat absorption. At its lower end the said coil is directly exposed to a gas burner *b*, which is set into a suitable casing 7 removably attached to the bottom of the vertical flue 4 in this instance and which has a cap 8 at its bottom with an air controlling damper *d* rotatably mounted thereon by a loose flanged union *e*.

The terminals or ends of the coil *c* have their pipe connections outside of the flue 4, and the said coil is designed to be exposed to the products of combustion from the furnace or heater under normal conditions. Otherwise, as when the fire is started or has died down and requires replenishing with a quick draft the direction of the draft is temporarily diverted through the unobstructed by-pass 5, which also is nearer the furnace. Hence I provide two operatively related draft and shut-off dampers 9 and 10, the damper 9 being located at the bottom of flue 5 and serving to open and close the same and the damper 10 at the entrance to flue 4 and checking or cutting off the draft through the same. Intervening means on the outside comprising arms and a link 7 are employed between these dampers to operate the same conjointly, so that when one is opened the other will be closed. The usual check damper 12 also is used, and a combined heat deflector and damper 14 of conical shape is employed in the top of the coil *c* and adapted to be raised and lowered therein according to the draft conditions desired. This device is suspended in the coil by means of a link 15 and a counter-weighted lever 16 supported on a pivot 17 and having

a clamping screw 18 or its equivalent at the top of the post adapted to set the damper 14 at any preferred elevation. The shape of the said damper gradually deflects the heat outward to the coils, so that at least practically all the otherwise waste heat from the furnace is economized and the products of combustion go off to the chimney practically cool.

Obviously when the gas burner *b* is being used and the furnace fire is out the damper 10 should be closed so as to confine the heat to the direct flue and about the coil *c*. Damper 14 will be used in this connection also to more or less choke or retard the outflow of heat and thus throw it more certainly into the coil.

Occasionally a situation presents itself where the room is limited in a vertical direction or the outlet *o* of the furnace is in substantially a horizontal line with the intake opening *I*. In this event the device may be set at an angle or even horizontally, especially if modified in a few particulars.

What I claim is:

1. A convertible water heating device having parallel flues at top and bottom and two connecting flues provided each with a separate damper, a source of heat adapted to discharge into either of said connecting flues, a spiral water coil located in the outer

of said connecting flues and heating means beneath the same independent of the said source of heat, whereby either or both means of heating can be employed to heat the said water coil or the coil can be cut out of the draft channel.

2. A source of heat having a flue for the products of combustion, in combination with a water heating coil in said flue, a heat deflector of conical shape located point downward in the top of said coil and means outside of said flue adapted to adjust the said deflector vertically to increase or decrease the passage about the same.

3. In heating installations for water heating coils, parallel horizontal flues and two parallel vertical flues connecting said horizontal flues having each a separate damper at its bottom, in combination with a spiral water heating coil arranged lengthwise in the outer of said vertical flues, a conical heat deflector projected into the upper end of said coil and means to raise and lower said deflector.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES A. MCGINNIS.

Witnesses:

R. B. MOSER,
WM. LEARY.