W. G. GILLESPIE.

FUEL SAVER.

APPLICATION FILED JAN. 20, 1919.

1,353,740. Patented Sept. 21, 1920.

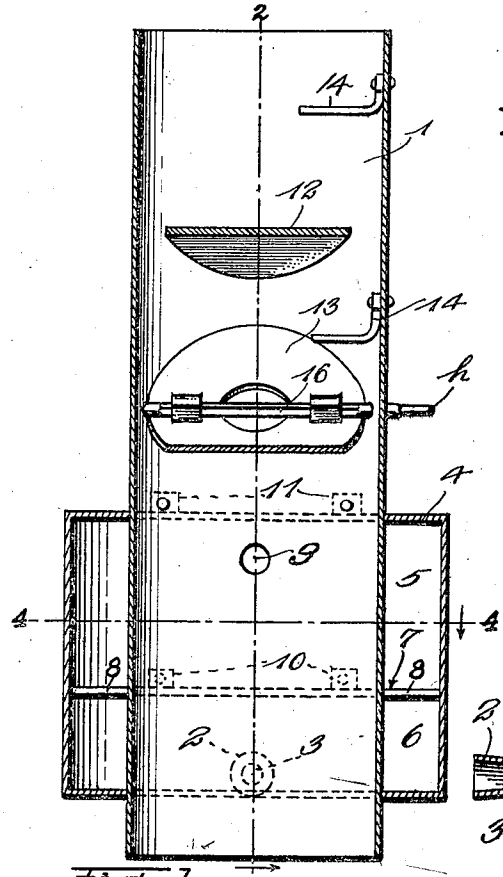


Fig. 1.

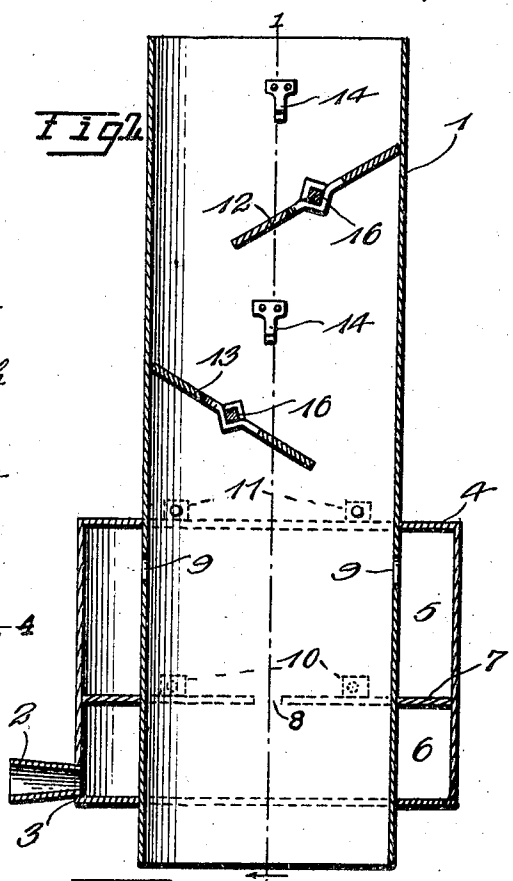


Fig. 4.

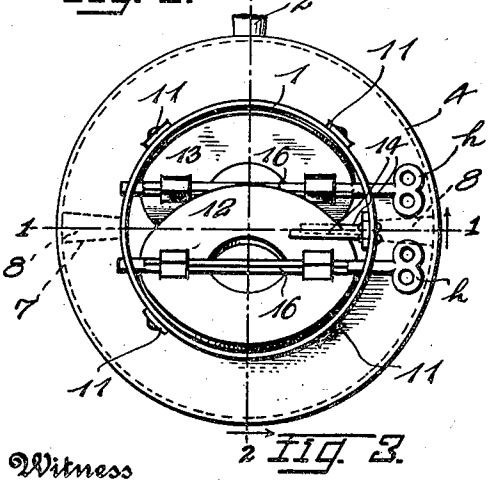
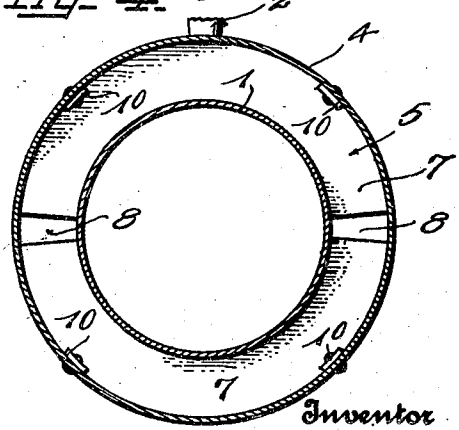


Fig. 3.



Witness

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FUEL-SAVER.

1,353,740. Specification of Letters Patent. Patented Sept. 21, 1920.

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To all whom it may concern:

Be it known that I, WILLIAM G. GILLESPIE, residing in the city of Chicago, county of Cook, and State of Illinois, have invented a new and useful Oxygenizing Device Known as a Fuel-Saver, of which the following is a specification.

My invention relates to improvements in oxygenizing devices, and more specifically to the class of oxygenizing devices in which pre-heated air is drawn through a drum, on the outside of a smoke-pipe, into the smoke-pipe and down into the fire-pot of a heater, stove or furnace, with which the smoke-pipe communicates, and in which the pre-heated air mixes with the volatile gases and renders the same combustible.

The object or purpose of this device is to provide an improved means for supplying pre-heated air into the smoke-pipe and thence into the fire-pot, so that the temperature of the oxygen will be raised before it comes into contact with the carbon monoxid and hydro-carbon gases arising from the fuel and entering the smoke-pipe, thereby accelerating the oxygenation of the gases; and at the same time to check the draft without detrimentally retarding the combustion.

I attain the foregoing results by means of the mechanism illustrated in the accompanying drawings in which:

Figure 1 is a vertical sectional view substantially along the lines 1—1 of Figs. 2 and 3.

Fig. 2 is a vertical sectional view substantially along the lines 2—2 of Figs. 1 and 2.

Fig. 3 is a top plan view.

Fig. 4 is a horizontal sectional view substantially along the line 4—4 of Fig. 1.

Referring to these drawings in detail, in which similar reference characters correspond with similar parts throughout the several views, the numeral 1 represents an inner tube or smoke-pipe on which is fastened a drum 4, this drum being divided into upper and lower compartments or chambers 5 and 6 by a pair of partition-plates 7 which are fastened to the inner side of the drum by means of rivets extending through lugs 10. The upper chamber or compartment 5 has approximately twice the capacity of the lower compartment 6. Rivets extend through lugs 11 of the drum and secure the drum to the inner tube. Between the ends of the arcuate partition-plates 7 there are provided two vents or air-passages 8 through which the upper and lower chambers or compartments communicate with one another. In the lower chamber 6 is an opening or inlet 3 in which is inserted an outwardly flaring funnel 2. Two vents or ports 9 are provided in the inner tube or smoke-pipe diametrically opposite each other and establish an open communication of the upper part of the upper chamber 5 with the interior of the smoke-pipe.

Two baffle-plates 12 and 13 respectively are pivotally mounted in the smoke-pipe in superjacent relation to one another and to the drum 4 and ports 9, the baffle-plate 12 having its pivotal axes located at one side of the vertical center of the inner tube, and the baffle-plate 13 having its pivotal axes at the other side of the vertical center of the smoke-pipe or inner tube so that each baffle-plate when in its effective position, is inclined at an angle of about 30 degrees to the horizontal. The tops of the baffle-plates are prevented from passing beyond the vertical center of the inner tube or smoke-pipe by means of stops 14 which are fastened to the inner surface of the smoke-pipe. It should be understood that each of the baffle-plates is adapted to be turned from the inclined effective position to the vertical ineffective position by means of a handle on the end of the pivot or shaft 16 which supports it, such handles being designated by the letter *h*.

When the baffle-plates are in their effective or inclined position, the inner edge of the upper baffle-plate extends over the inner edge of the lower baffle-plate, and this arrangement coacts with the stove-pipe for providing a circuitous passage through which the products of combustion pass in escaping through the smoke-pipe. By means of this circuitous passage, the products of combustion are retarded, so that they will not create a sufficient upward draft to cause the preheated air from the drum to pass upward.

The application and operation of the device is as follows:

The complete device is placed on the heater, stove or furnace in the same manner in which any ordinary smoke-pipe is attached, the drum end of the device being ad-

jacent to the fire-pot, and constituting the lower part of the device. The function of the device is performed while the dampers are set in the inclined position, by checking or retarding the draft without entirely shutting off the draft. The temperature below the baffle-plates in the smoke-pipe and fire-pot, rapidly increases and lightens the products of combustion to such extent that the cold air from the outside presses this lighter fluid or smoke upward so that it passes through the circuitous passage and out of the smoke-pipe. However, the pre-heated air which passes through the ports 9 into the smoke-pipe is somewhat cooler and heavier than the smoke, and therefore, it gravitates along the inner surface of the smoke-pipe until it enters the fire-pot or mixes with the carbon gases arising from the fire-pot. Although the air from the ports 9 is sufficiently cool and heavy to effect its downward movement of air in the smoke-pipe, it is also sufficiently warm to enable the oxygen to readily combine with the carbon gases.

It should be understood that when the baffle-plates are turned parallel with the vertical center, they are ineffective, and permit the draft to have its maximum strength and velocity, so that the fire may be started with the utmost facility, or without being checked or hindered by the baffle-plates. However, these plates may be very quickly and easily turned to their effective position after the fire has been started.

I am aware that there have been other devices that heat the air by means of a casing around the smoke-pipe, in which the air is drawn through the space in the outer casing and the smoke-pipe, and therefore, I do not claim this method of heating the air broadly, but what I claim is:

1. A device of the character described, a smoke-pipe having ports in its wall, a drum surrounding said smoke-pipe and having arcuate partition plates extending substantially in the same horizontal plane and spaced from one another to provide air passages from the lower compartment of the drum to the upper compartment thereof, said lower compartment being provided with an air inlet which communicates with the outer air, said ports being in open communication with the interiors of said upper compartment and smoke-pipe, and arranged on an axial plane that intersects at right angles the plane in which the said air passages are arranged.

2. In a device of the character described, a smoke pipe having ports in its walls, a drum surrounding said smoke pipe and having a horizontally disposed partition dividing the drum into upper and lower compartments and cut to provide air passages from the lower compartment of the drum to the upper compartment thereof, the lower compartment being provided with an air inlet opening, and said ports being in open communication with the interior of the smoke pipe and the upper compartment of the drum and arranged on an axial plane intersecting at right angles the plane in which the air passages of the ports are arranged.

3. In a device of the character described, a smoke-pipe having ports in its walls, a drum surrounding said smoke-pipe and comprising a lower compartment and an upper compartment and being provided with air passages through which these compartments communicate with one another, the lower compartment being provided with an air-inlet which communicates with the outer air, said upper compartment communicating with the interior of said smoke-pipe through said ports, and baffle-plates spaced one above the other in said smoke-pipe and at a higher level than said ports, said baffle-plates being located respectively nearer to one side of the smoke-pipe than to the other side, the upper one of these baffle-plates having its inner edge extending over the inner edge of the lower one of these baffle-plates, thereby providing a circuitous passage past these baffle-plates.

4. In a device of the character described, a smoke pipe having ports in its walls, a drum surrounding said smoke pipe and provided with an air inlet, the upper portion of the drum communicating with the interior of the smoke pipe through said ports, and baffle-plates spaced one above the other in said smoke pipe and at a higher level than the ports, said baffle-plates being located respectively nearer one side of the smoke pipe than to the other side and the upper one of the baffle-plates having its inner edge extending over the inner edge of the lower one, thereby providing a circuitous passage past the baffle-plates.

WILLIAM G. GILLESPIE.