

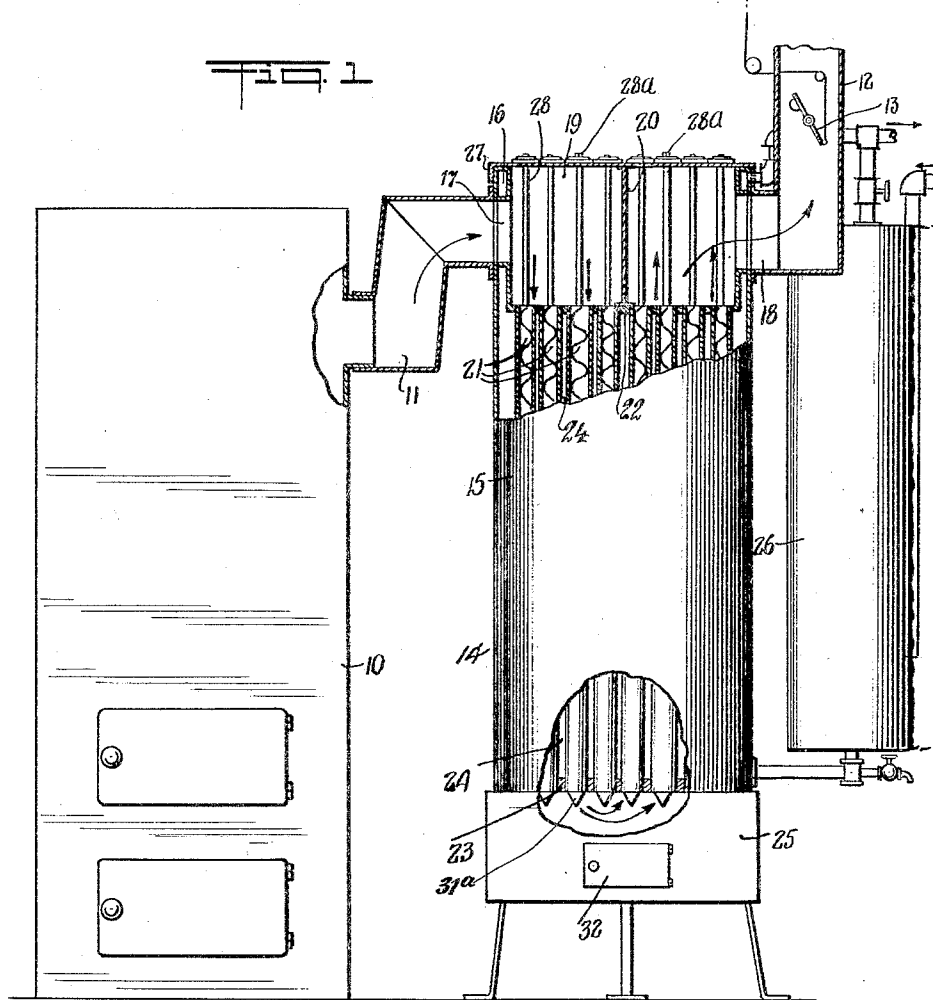
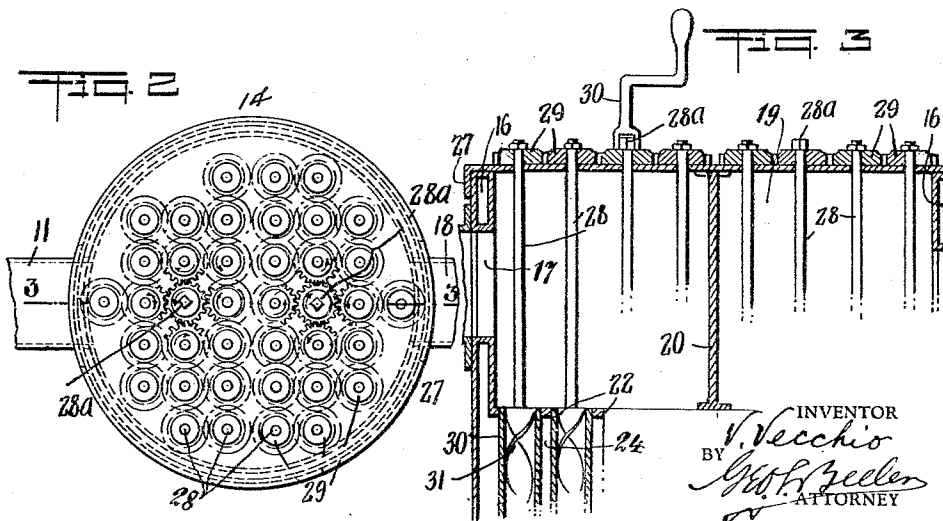
May 8, 1928.

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V. VECCHIO

FURNACE ATTACHMENT

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UNITED STATES PATENT OFFICE.

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FURNACE ATTACHMENT.

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This invention relates to heating appliances and has particular reference to heat transferring mechanism used in connection with domestic furnaces or the like.

Among the objects of the invention is to provide an attachment for a furnace or its equivalent having improved and peculiar facilities for extracting a considerable amount of heat from the smoke or products of combustion that pass normally out through the smoke stack or chimney and usually wasted. More definitely, my improvement consists in the arrangement of a specially constructed drum interposed between the furnace and chimney or smoke stack and through which the products of combustion are compelled to pass, said drum being provided with a water jacket and water compartment through the latter of which are arranged a series of fire tubes with means for compelling the draft of the products of combustion in two different directions through said drum, said drum being in communication with any suitable source of supply or storage for said heated water.

With the foregoing and other objects in view the invention consists in the arrangement and combination of parts hereinafter described and claimed, and while the invention is not restricted to the exact details of construction disclosed or suggested herein, still for the purpose of illustrating a practical embodiment thereof reference is had to the accompanying drawings in which like reference characters designate the same parts in the several views, and in which—

Figure 1 is a side elevation of a conventional furnace showing the course or path of the products of combustion therefrom in connection with my improved heating drum.

Fig. 2 is a diagrammatic plan view of the top of the drum.

Fig. 3 is an enlarged vertical section of the top of the drum.

Referring now more specifically to the drawings I show at 10 any suitable source of heat such as a domestic furnace from which leads outward and upward a flue 11 toward but remote from the smoke stack connection 12 provided with any suitable draft regulator or damper 13.

Interposed between the flues 11 and 12 is my improved heat extracting drum 14 of any suitable size, design, or proportions, but comprising a shell 15 shown as cylindrical in form, the shell having an upward exten-

sion 16 constituting a hollow cylindrical water jacket located between the flues 11 and 12, the water jacket being provided with an inlet opening 17 and an outlet opening 18 with which said flues 11 and 12 communicate directly and with the interior chamber or space 19 of the head of the drum. A vertical partition 20 subdivides the head space above mentioned into practically two equal portions and prevents the direct communication from one flue to the other.

The main portion of the drum 14 is equipped with a vertical series of fire tubes 21 spaced parallel from one another, both ends of the tubes being open for passage of the products of combustion and sealed by means of heads 22 and 23 at the top and bottom respectively whereby the space surrounding the several tubes may be supplied with water or other heat conducting medium as indicated at 24, the water filling the entire drum around the tubes and filling the jacket 16 at the top of the drum. The products of combustion passing from the furnace through the flue 11 enter the first compartment of the hollow head at 19 and are thence reflected downward by means of the partition 20 so as to pass downward entirely through the first set of fire tubes, passing thence through the bottom space 25 and thence upward through the remaining set of fire tubes into the second compartment of the head space 19 within the water jacket 16 and thence out through the opening 18 into the chimney connection 12. Naturally the greatest amount of heat is received within the water jacket portion of the drum from which the water in the jacket 16 is heated directly and from which the water is drawn or circulates to the heating system of the building or to a tank such as indicated conventionally at 26 for use as may be required for domestic or other purposes.

The head or upper portion of the drum structure is provided with a removable cap 27 within which are journaled a series of shafts 28 each having at its upper end, outside the cap, means for rotation of the shaft, the same being indicated as in the nature of a gear wheel 29, all the gears of one half the series being in mesh with one another as shown in Fig. 2. One of the shafts as 28 is provided with a squared end for the reception of a wheel or crank 30 for rotation thereof, and this rotation will cause the rotation of all the shafts in the same group.

Each shaft, suspended from the cap 27, carries a spiral baffle member 31 which is co-extensive with one of the fire tubes 21 and within which it is normally located. These
5 baffles are made of flat sheet metal or its equivalent and serves immediately to cause the products of combustion while passing through the fire tubes to impinge fully against the side walls thereof for the best
10 transfer of the heat to the surrounding water, and secondly, the baffles serve as means to keep the fire tubes clean from soot, ashes, or other deposit which would interfere with the heat transfer. The rotation of the
15 shafts and baffles from time to time by means of the crank or wheel applied as indicated insures that they shall be kept clean from deposit. Soot or ashes so deposited and scraped from the inner surfaces of the tubes
20 will fall into the pit 25 from which the same may be removed when desired through the door 32. Preferably the lower end of each of the baffles is pointed as shown at 31^a for easy
25 entrance of the baffles into the tubes when assembling the mechanism. It will be understood that for repair or inspection of the mechanism, the cap 27 and all the shafts and baffles may be elevated and removed from the

drum as a whole at any time and for replacing of course the pointed ends of the baffles 30 assist materially in causing the baffles to enter the respective tubes.

I claim:

In a device of the class set forth, a drum, means to supply the drum with water, a series of fire tubes passing lengthwise and parallel to one another through said drum, flue connections for one end of the drum, means to cause the products of combustion to pass from one of said connections lengthwise 40 through one set of fire tubes and thence in the other direction through the other set thereof to the other flue connection, a series of baffles located in said fire tubes and serving to cause maximum transfer of heat 45 therefrom to the surrounding water, and means to support said baffles, the means to support the baffles being a cap removably supported upon one end of the drum and a series of shafts journaled in said cap and 50 connected to the respective baffles, means being provided to rotate the baffles and shafts simultaneously in groups for scraping the interior surfaces of the fire tubes.

In testimony whereof I affix my signature.
VINCENT VECCHIO.