

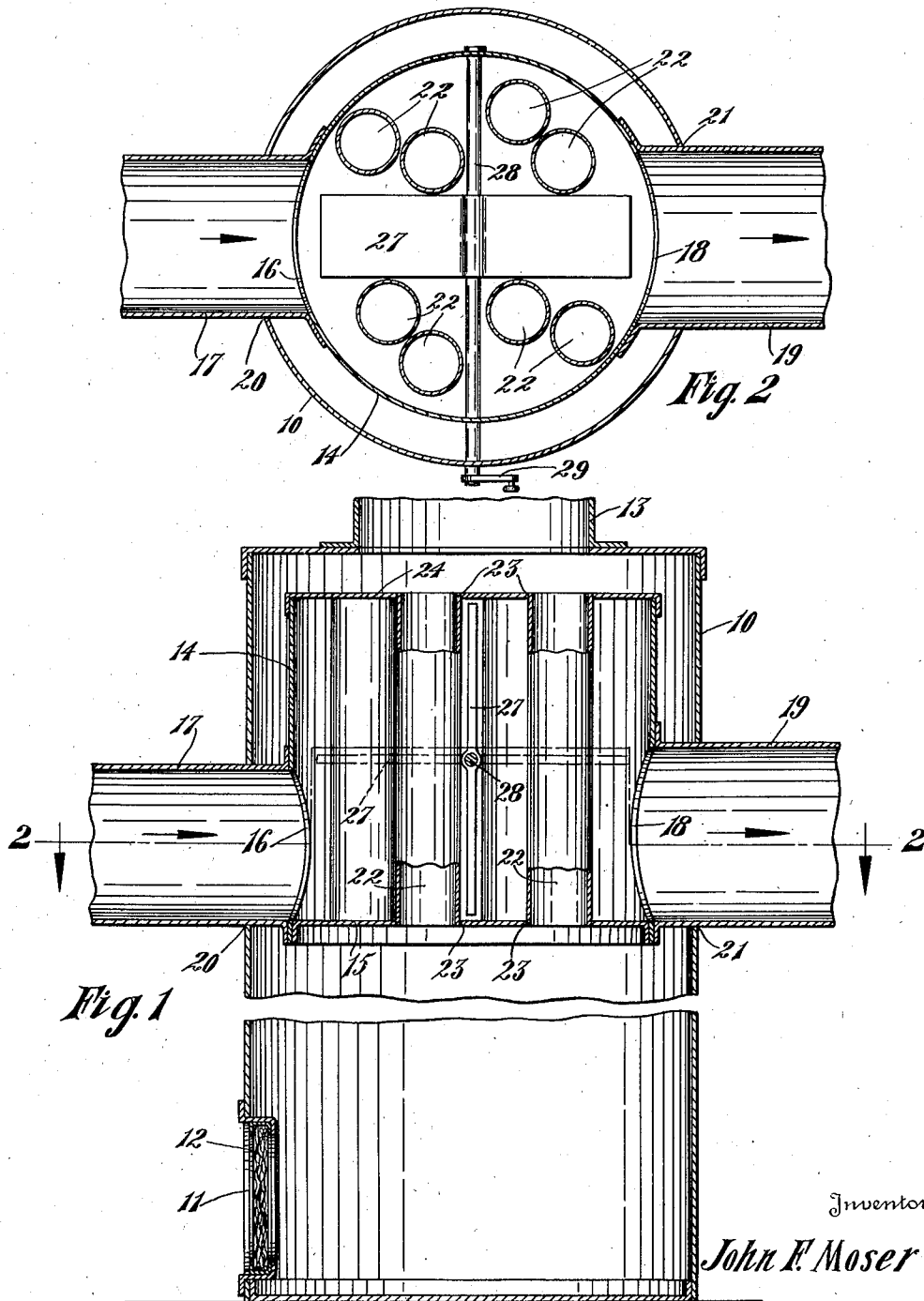
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AIR HEATING APPARATUS

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AIR HEATING APPARATUS

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3 Claims. (Cl. 257-169)

The invention relates to an auxiliary air heating apparatus for connection to the chimney pipe of a furnace, stove or the like for utilizing heat which would ordinarily be wasted for heating an additional room or other space.

It is common knowledge that with the ordinary furnace or stove, a considerable amount of heat is wasted by allowing the hot gases to pass through the chimney pipe or stove pipe to the stack or chimney before the major part of the heat is extracted therefrom.

The object of the present invention is to reduce this waste of heat to a minimum by locating an air heating apparatus in the chimney pipe or stove pipe for extracting substantially all of the waste heat to heat air passing through said apparatus and conveying it through a flue to a hot air register or the like.

Another object is to provide a simple and inexpensive air heater which may be manufactured from sheet metal and may be easily installed.

A further object is to provide an apparatus of this character which is so constructed that soot will not collect in the same to cut down the efficiency of the apparatus.

A still further object is to provide an apparatus of this character which will be substantially self-cleaning.

Still another object is to provide an air heater including a heating drum communicating at opposite sides, and substantially at the bottom thereof with the chimney pipe or stove pipe.

A further object is to provide such an apparatus with a damper so arranged that it may form a baffle around which the hot gases from the furnace or stove will be deflected upon the air heating pipes or which may be so positioned as to permit a direct draft of the hot gases through the lower portion of the heating drum to remove any soot which may have accumulated therein.

The above objects together with others which may be apparent from the drawing and following description or which may be later referred to, may be attained by constructing the improved air heater in the manner illustrated in the accompanying drawing, in which

Figure 1 is a vertical sectional view through an air heating apparatus constructed in accordance with the invention; and

Fig. 2, a horizontal section taken as on the line 2-2, Figure 1.

Similar numerals refer to similar parts throughout the drawing.

The heating apparatus includes an outer casing 10 which may, if desired, extend down to the

floor as shown in Fig. 1 having a cold air inlet 11 which may be provided with a filter 12 to prevent dust and dirt from entering the casing.

A flue 13 may communicate with the upper end of the casing and may lead to a hot air register or the like in the room to be heated by the apparatus.

An inner casing 14 is located within and spaced from the sides, top and bottom of the outer casing 10. This inner casing has at one side, and preferably at its bottom an inlet opening 16 communicating with the usual chimney pipe 17 which leads from the furnace.

Diametrically opposite to the opening 16 and also at the bottom of the casing is a somewhat larger opening 18 communicating with the pipe 19 which is proportionately larger than the pipe 17 and which leads to the chimney or stack.

As shown in the drawing the pipes 17 and 19 are located through and tightly fitted within apertures 20 and 21, respectively, in the outer casing 10 so that no air or dust may pass through these joints.

A plurality of vertical tubes 22, open at both ends, are located through the inner casing 14 and secured at their upper and lower ends by air-tight joints within the apertures 23 formed in the upper and lower walls 24 and 15, respectively, of the inner casing.

As best shown in Fig. 2 it will be seen that these tubes 22 are located in staggered relation and in such position that the central portion of the inner casing is unobstructed.

An adjustable damper or baffle plate 27 is adapted to be located through this unobstructed central portion of the inner casing and is mounted upon a shaft or rod 28 pivotally mounted through both sides of the inner and outer casings, and located substantially in line with the top of the chimney pipe 17, as shown in Fig. 1.

A crank handle or the like as shown at 29, may be fixed upon the outer end of said shaft for adjusting the damper or baffle plate to the vertical position as shown in Fig. 1, or to the horizontal position as shown in Fig. 2, and in broken lines in Fig. 1.

With the damper or baffle plate located in vertical position as shown in full lines in Fig. 1, it will be seen that the hot gases coming from the furnace through the pipe 17 cannot pass directly through the inner casing 14 to the outlet pipe 19, but will be baffled by said damper and caused to pass around each side of the same, tending to further heat the tubes 22.

However, when the damper is in the horizontal

position as shown in broken lines in Fig. 1, and as also shown in Fig. 2, a direct draft of the hot gases may pass through the lower portion of the inner casing 14 from the inlet pipe 17 to the outlet pipe 19 loosening and carrying with it any accumulation of soot which may be deposited upon the bottom wall 15 of the inner casing.

The operation of the damper 27 from one position to another will also assist in removing any soot from the adjacent sides of the tubes 22 which are located quite close to the damper as shown in Fig. 2, and this loosened soot will be carried out of the casing 14 to the chimney by the direct draft of hot gases passing there-through.

The operation of the apparatus will be obvious from the drawing and above description. The hot gases entering the inner casing 14 from the furnace through the pipe 17 will heat the entire casing 14 as well as the tubes 22 therein, and the cold air entering the outer casing 10 through the inlet opening 11 will be quickly heated as it passes up around the inner casing 14 and through the tubes 22, and this heated air will pass up through the flue 13 to the register or the like provided for utilizing the heat thus obtained.

I claim:

1. A heating unit comprising an outer casing having a cold air inlet in its lower portion and a hot air outlet in its upper portion, an inner casing within and spaced from the walls of the outer casing, a plurality of open ended vertical tubes located through the inner casing and communicating with the space between the casings, a hot gas inlet pipe extending through the outer casing and communicating with the inner casing adjacent to the bottom thereof, and an outlet pipe communicating with the opposite side of the inner casing adjacent to the bottom thereof and extending through the outer casing, said tubes being so located that the central portion of the inner casing is unobstructed between said inlet and outlet pipes and a damper mounted upon a horizontal pivot and located within the inner casing between said tubes, the damper

being so constructed and arranged that when it is in horizontal position it extends substantially from the inlet side to the outlet side of the inner casing and when it is in vertical position it extends substantially from the top to the bottom of the inner casing.

2. A heating unit comprising an outer casing having a cold air inlet in its lower portion and a hot air outlet in its upper portion, an inner casing within and spaced from the walls of the outer casing, a plurality of open ended vertical tubes located through the inner casing and communicating with the space between the casings, a hot gas inlet pipe extending through the outer casing and communicating with the inner casing adjacent to the bottom thereof, and an outlet pipe larger than the inlet pipe communicating with the opposite side of the inner casing adjacent to the bottom thereof and extending through the outer casing, said tubes being so located that the central portion of the inner casing is unobstructed between said inlet and outlet pipes.

3. A heating unit comprising an outer casing having a cold air inlet in its lower portion and a hot air outlet in its upper portion, an inner casing within and spaced from the walls of the outer casing, a plurality of open ended vertical tubes located through the inner casing and communicating with the space between the casings, a hot gas inlet pipe extending through the outer casing and communicating with the inner casing adjacent to the bottom thereof, and an outlet pipe communicating with the opposite side of the inner casing adjacent to the bottom thereof and extending through the outer casing, said tubes being so located that the central portion of the inner casing is unobstructed by tubes between said inlet and outlet pipes and a damper mounted upon a horizontal pivot substantially in line with the top of the inlet pipe and located within the inner casing, between said tubes and between said inlet and outlet pipes, the side edges of said damper being movable in a path close to the adjacent tubes.

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