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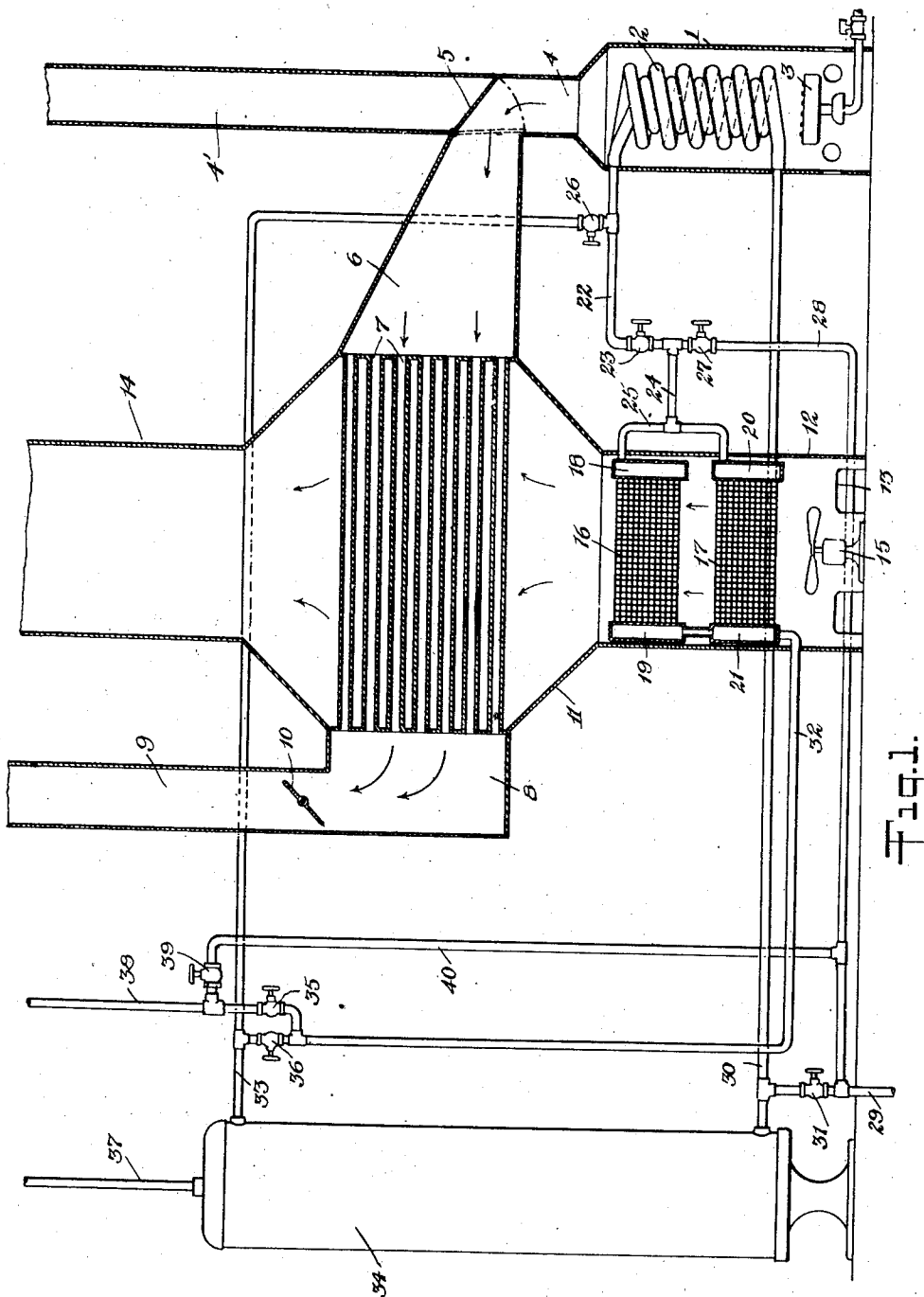
A. DE LORE

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HEATING AND COOLING SYSTEM FOR HOUSES

Filed Sept. 5, 1946

2 Sheets-Sheet 1



WITNESSES

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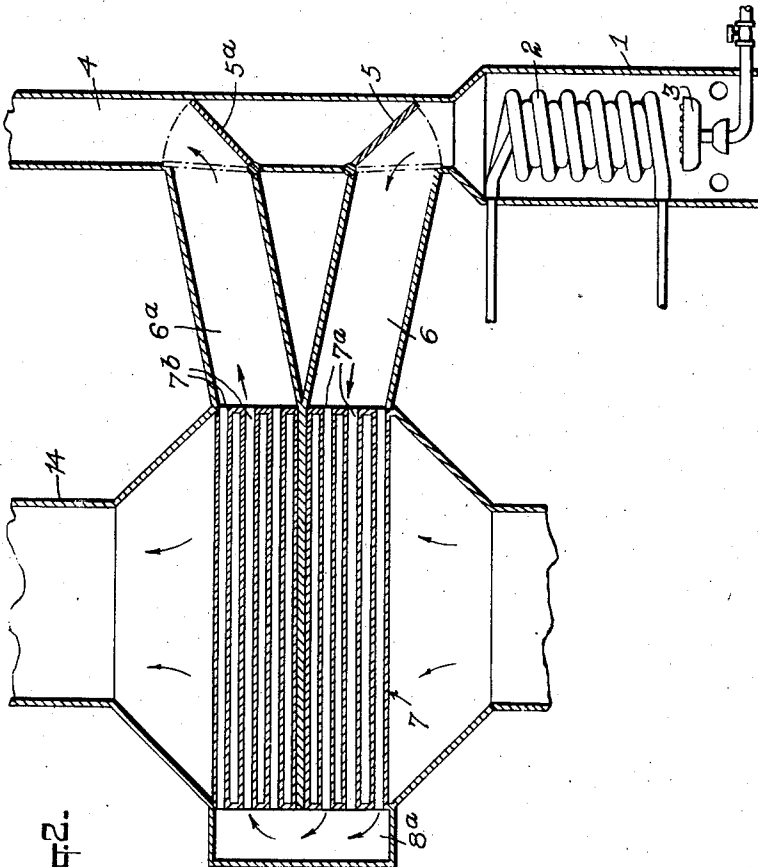
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HEATING AND COOLING SYSTEM FOR HOUSES

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2 Claims. (Cl. 257-9)

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This application is a refile of the application filed by the present applicant on September 29, 1937, under Serial Number 166,354, now abandoned.

This invention relates to heating and cooling systems for houses, as for instance dwellings, the object being to provide a construction wherein maximum results may be secured from fuel used in heating.

Another object of the invention is to provide a heating system which may be converted into a cooling system and the water used in the house utilized to produce a cooling action for the air in the house before the water is drawn from the water pipes.

An additional object is to provide in a heating and cooling system for houses a construction for utilizing heat from a hot water supply and also utilizing the products of combustion for producing heated air for the house while at the same time providing heated water that may be used as desired.

In the accompanying drawings:

Figure 1 is an elevational view of a heating and cooling system disclosing an embodiment of the invention, certain parts being shown in section and Figure 2 is a modification thereof.

Referring to the accompanying drawings by numerals, 1 indicates a heater of any desired kind, as for instance a coal, oil, or gas burning heater, adapted to provide heat for heating the various coils 2 or other water carrying members. As the heat from the burner 3 rises the coil 2 will be heated and the water therein will also be heated. The products of combustion, however, will pass out through the chimney 4 and be deflected by a shutter 5 into a substantially funnel-shaped pipe 6 which directs the products of combustion through the various pipes 7 to a header or drum 8. From the header or drum 8 what is left from the products of combustion will pass out through the chimney past an adjustable damper 10. This damper is normally left partly closed so as to retard the passage of the products of combustion without stopping the same. The cross sectional area of the various pipes 7 is much greater than the cross sectional area of the chimney 4 so that the hot products of combustion will move very slowly through pipes 7 and will lose most of their heat.

As shown in Figure 2 another variation of the arrangement of this system would make it possible to utilize only one chimney 4 and dispense with chimney 9. This could be accomplished by making the funnel-shaped pipe 6 smaller so

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that it directed the products of combustion through the lower section 7a of the group of pipes 7 and thence into the heater or drum 8a. However, instead of having the products of combustion carried off through chimney 9, they would be redirected through the upper section 7b of the group of pipes 7 out through an upper funnel-shaped member 6a similar to 6 that would be connected with chimney 4 and deflected by shutter 5a up the chimney 4.

It will be observed that the pipes 7 are arranged in a substantially double cone-shaped casing 11 that receives air through the air supply tube 12. This tube has suitable openings 13 adapted to receive air from the cellar of the house being heated or from a point outside of the house. This air is usually at approximately atmospheric temperature but will be heated as it moves upwardly through pipe 12 into the drum 11 and finally out through the hot air pipe 14. The pipe 14 is adapted to discharge in one or more rooms of the house with suitable registers or shutters controlling the flow of heated air from pipe 14.

By the construction just described most of the heat from the products of combustion is used in heating air passing into the various rooms of the house. If desired an electrically actuated fan 15 may be caused to function. This fan will cause the air to travel upwardly past not only the heating pipes 7 but the heating elements 16 and 17. These latter heating elements are heated by hot water and may be constructed as a honeycomb heater, although pipes similar to pipes 7 may be used if desired. The heater 16 is provided with an inlet header 18 and an outlet header 19, while heater 17 is provided with an inlet header 20 and an outlet header 21. Hot water from coil 2 will pass through pipe 22, valve 23, pipe 24 and pipe 25 to the headers 18 and 20. It will be understood that the valve 26 is closed at this time. Also valve 27 in the cold water inlet pipe 28 is closed. Pipe 28 has one end connected to the water supply main 29 which water supply main is connected through valve 31 to a return pipe 30 so that water from the main may be directed when desired to the bottom of coil 2.

A valve 31 is interposed in pipe 29 and is normally left open at all times. As the water is heated in coil 2 it will pass as described to the headers 18 and 20, and thence through the heaters 16 and 17 to the headers 19 and 21. Water from header 19 passes to header 21 and then into the pipe 32, and from pipe 32 into the hot water pipe 33 and thence into the top of the domestic boiler 34. It will be understood that the valve 35 is

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closed while valve 36 is open. Hot water passing in the path just described will heat the heating members 16 and 17 and air passing these heated members will absorb heat therefrom. This heated air will be further heated by the hot pipes 7 so that ample heated air may be supplied to the hot air pipe 14. If the fan 15 is not functioning the heated air will automatically draw in cold air from the bottom but this action will be slower than if the fan 15 was operated. An outlet pipe 37 is connected to the top of the boiler 34 and is adapted to supply hot water to one or more rooms in the house in which the system is mounted.

Preferably the structure shown in the drawing is arranged in the basement or cellar of the house so that the heated air may be directed to any or all rooms in the house and also the hot water passing through pipe 37 may be led to one or all rooms in the house. Pipe 38 may also be connected to all of the cold water outlets in the house. In the winter time or when the heating structure is used, valve 35 is closed but valve 39 is open. A pipe 40 extends from valve 39 to pipe 28 and communicates through a short distance of pipe 28 with the water main or supply pipe 29 so that there is always cold water in pipe 40. Whenever any cold water is being used in the house, said water will pass from pipe 29 through pipe 40, valve 39, and then through pipe 38. However, when the heating part of the device is not being used, valve 39 is closed and also valve 36 while valve 35 is opened. It will be noted that the return pipe 30 connects the bottom part of boiler 34 with the bottom portion of the coil 2 so that when there is no hot water being used there will be a proper circulation of water to and from boiler 34. It will be understood that whenever hot water is drawn off through pipe 37 water from pipe 29 will pass into the bottom of boiler 34 in the usual way.

In the summer or whenever it is desired to use the system for cooling purposes, the burner 3 is naturally run at a lower speed so as to produce much less heat, namely, only sufficient heat to provide a proper supply of hot water in boiler 34. Valve 26 is then opened while valve 23 is closed and valve 27 is opened. In addition valves 36 and 39 will be closed and valve 35 opened. This will cause all water drawn out through pipe 38 to pass from pipe 28 to the radiating members 16 and 17 and then through pipe 32 and valve 35 to pipe 38. Cold water flowing in this path will naturally chill the members 16 and 17 so that if fan 5 is operated and air is blown against these members a certain amount of heat from the air is absorbed and the cool air will pass upwardly and through pipe 14 to the various rooms of the house. When cool air is being secured in this manner damper 5 is swung over to the dotted position shown in the drawing so that the products of combustion will pass out through the chimney or smoke stack 4' instead of through the pipes 7. In this way the air is cooled without any expense whatever as water flows through the cooling members 16 and 17 only when cold water is being drawn from any of the spigots or other outlets in the house. It will therefore be seen that when desired the device could be used for heating the air entering the house in addition to maintaining a supply of hot water for use at any desired point in the house.

The construction shown in the drawing is adapted to be substituted for the usual furnace now in ordinary dwelling houses and for the usual domestic boiler structure now in common use.

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It will of course be understood that the heating structure 1 must be of a proper size to secure the desired amount of heat for the particular size of house using the device. Also it will be understood that the burner 3 or other heating structure may be caused to function to give out a large amount of heat or a small amount of heat as desired whereby only sufficient heat is created to secure the desired change in temperature in the house. Usually the heater is run at a very low point in the spring and fall but at a higher point during the colder months of the winter. During the summer the heater is run at its lowest point so as to provide only enough heat to supply the boiler 34 with hot water.

Whereas I have described my system in its preferred form, it should be realized that minor changes could be made without departing from the principal scope of my invention.

I claim:

1. A device of the character described comprising a construction for providing heated air for heating a building in cold weather and cool air for cooling said building in warm weather, said construction including a casing having an air inlet at the bottom and an air outlet at the top, an upper heat exchange unit in said casing near the top thereof, a lower heat exchange unit in said casing near the bottom thereof, a primary system of pipes for directing cold water through said lower heat exchange unit, one end of said system being connected to a cold water supply main, a heater having a coil therein for heating water, a secondary system of pipes for directing hot water from the top of said coil through said lower heat exchange unit, means for connecting said heater to a cold water supply main, said heater having two outlets for the products of combustion thereof, one of said two outlets including said upper heat exchange unit and the other an outlet chimney, and a hand adjustable damper mounted so that when in one position it will close said outlet chimney and deflect the hot products of combustion from said heater to and through said upper heat exchange unit for heating the same and when in an opposite position will deflect said hot products of combustion from said upper heat exchange unit to said outlet chimney.

2. In a heating and cooling system, a casing formed with a tubular inlet section, an enlarged upper section and an outlet pipe extending upwardly from said upper section, a plurality of heating pipes extending transversely from one side of said upper section to the other, a heat exchange device arranged in said inlet section, a piping system for directing cold water through said heat exchange device, a heater having a casing and a heating coil therein for heating water, a secondary piping system for directing hot water from said coil through said heat exchange device, said heater casing having a chimney at the top, a funnel-shaped pipe for directing hot gases from said chimney to said upper section, the small end of the funnel-shaped pipe engaging said chimney, a hand-actuated damper positioned in respect to said opening and said funnel-shaped pipe to deflect the hot gases from said heater into said funnel-shaped pipe when in one position and to deflect the hot gases into said chimney when in another position and wherein said other position prevents hot gases entering said funnel-shaped pipe, and a hollow member on the opposite side of said upper section for di-

recting hot gases from said heating pipes to a discharge point.

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