

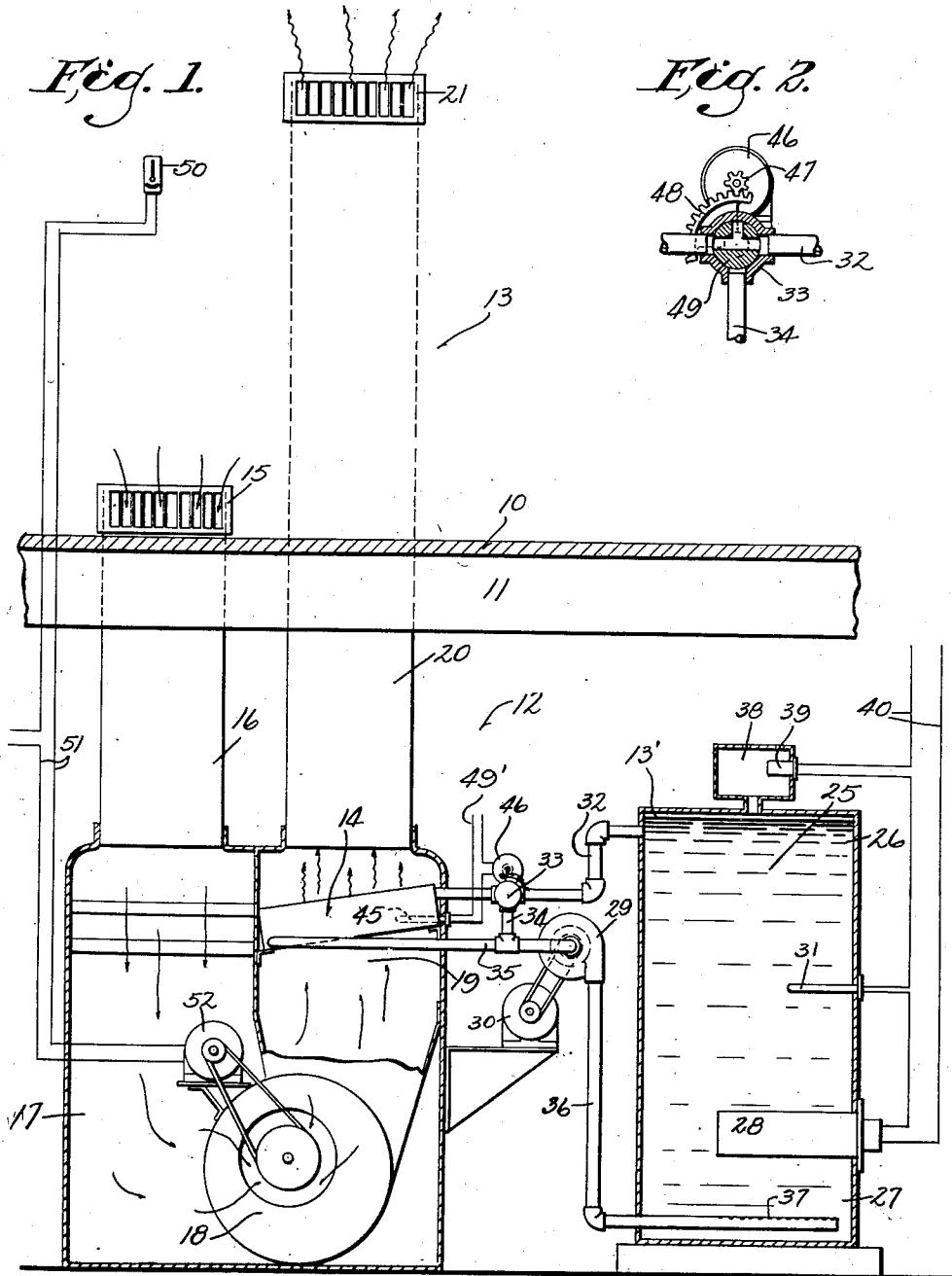
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HEATING SYSTEM

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HEATING SYSTEM

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1 Claim. (Cl. 237—1)

My invention relates to improvements in heating systems.

The object of my invention is to provide a space heating system of the general type in which a radiator used as a heat exchanger is supplied with heated fluid and in which a heater for the fluid to be transferred into and out of the radiator is, together with said radiator or heat exchanger, filled with an oil, preferably a vegetable oil, which has a very high-boiling point and provides an excellent means of transferring heat units from a heater to a radiator.

Another object of my invention is to provide a special heating and circulating structure for vegetable oil, wherein a constant circulation is maintained during the active heating process and a rapid circulation of the oil itself around the heating means is maintained in order to prevent charring or coking of oil upon the surface of the heating device.

Another object of my invention is to provide means whereby heated vegetable oil may be stored at extremely high temperatures and used as desired without affecting the heat transfer to rooms to be heated by my improved heating system.

A further object of my invention is to provide means whereby vegetable oil may be heated and stored at extremely high temperature without danger of over-expansion.

In the drawing:

Figure 1 is a somewhat diagrammatic view of my heating system installed in a dwelling.

Figure 2 is a detail of a valve which I use for controlling the circulation of heating oil in my heating system.

Like parts are designated by the same reference characters throughout the several views.

For the purpose of brevity of description and clarity of disclosure I have shown my improved heating system installed in the form of a space heating system such as is popularly designated at the present time as an air conditioner for dwellings and it will be understood that my heating system contemplates heat exchange by means of any form of radiator and any form of circulating system for space heating devices whether the radiators or heat exchangers are positioned in the rooms or spaces to be heated or are concentrated in a heat exchange device as herein described.

Figure 1 shows an installation of a heating system in the portion of a dwelling wherein 10 indicates the floor upon joists 11 below which is the "furnace room" 12 and above which is a

room 13, to be heated. The larger structural elements involved in the heat exchange and space heating equipment shown in Fig. 1 include a heater or boiler 13', a radiator or "unit heater" 14, and an air circulating system including a cold air return register 15, a cold air return duct 16, a plenum chamber 17, a power fan device 18 for passing cold air from the return duct 16 into the heat exchange space 19 through the radiator 14 and into a hot air supply duct 20 from which the hot air is discharged into the room 13 through register 21. The elements thus far described are in general conventional in modern home heating devices of the "air conditioning" type.

My new heating system and heat transfer medium includes the provision of an oil, preferably a vegetable oil 25, to fill the boiler or storage chamber and to be circulated to and from the boiler 13 in a pipe or conduit circuit including the radiator or heat exchanger 14. It is thus possible for me to maintain a storage quantity of hot oil at approximately 200 to 800 degrees Fahrenheit, which oil I maintain in constant circulation between the upper portion 26 of the storage chamber and the lower portion 27 thereof beneath the heater 28, while the heater is in operation. Such circulation is induced by means of a centrifugal pump 29 which is driven by motor 30 which is energized simultaneously with the heater 28. I prefer to use an electric heater controlled by a thermostat 31 which is in electrical series connection with the heater 28 and with said motor 30. A pipe 32 leading from the top portion 26 of the storage chamber leads to a three-way valve 33 which controls the passage of hot oil to the heat exchanger 14. If the passage of oil to the heat exchanger 14 is shut off, the valve 33 opens a passage through a shunt pipe 34 leading to pipe 35 comprising the return lead from the heat exchanger. Thus when the valve is turned to pass hot oil through the shunt the pump 29 will circulate hot oil from the top of the storage chamber to the bottom thereof through a return pipe 36. The return pipe 36 at the point where it terminates in the lower portion 27 of the storage chamber is perforated as shown at 37 thus directing a strong current of oil against and around the heater 28.

By means of the heating and circulating devices above described, I am able to heat the oil without causing a deposit of charred vegetable matter upon the surface of the heater.

I usually set my thermostat 31 so that the heater 28 will continue to operate until the tem-

perature of the oil in the storage chamber attains the height of approximately 800 degrees. If for any reason expansion of the oil takes place prior to the time such temperature is attained, the oil
5 will expand into an expansion chamber 38 in which I provide an electrical switch 39 responsive to the presence of the oil whereby the switch 39 will open the circuit in the electrical wires 40 supplying the heater 28 with current and will
10 shut off the heater for purposes of safety.

Having provided means whereby to maintain oil at high temperature, I provide a control for the valve 33 whereby to shut off the circulation of hot oil through the heat exchanger 14 at a
15 given temperature. To attain this end I provide a thermostat 45 adjacent the heat exchanger 14 and this thermostat is connected electrically with a motor 46, a pinion 47 upon the shaft of which motor is engaged with a sector 48 upon
20 the plug 49 in the three-way valve 33. When the thermostat 45 registers a temperature below a predetermined set temperature in the heat exchanger 14 the motor 46 is energized to open the valve 33 and thus pass heated oil to the ex-
25 changer. When the temperature rises above a predetermined point the circuit is broken in electric line 49 and the valve 33 is thrown to circulate hot oil to the shunt 34 and back to the bottom of the storage tank.

Having provided means for heating the oil and means for maintaining the heat exchanger 14 in proper condition for heat transfer to the rooms to be heated by my heat system, I provide
5 a thermostat 50 in the rooms to be heated. This thermostat is used to complete a circuit in the electric line 51 to energize motor 52 whereby to drive fan 18 when a room heating operation is desired. Air transferred by the fan through-
10 out heat exchanger 14 is then passed through the register 21. When the space 13 has been heated, the thermostat will break the circuit through the line 51 and the fan 18 will be stopped.

I claim:

A storage chamber for a heating system, vegetable oil in said storage chamber, a heater in said
15 chamber whereby to heat the oil to a high temperature, and a circulatory system for the high temperature oil whereby to pass oil to and from said chamber, said circulatory system including
20 a conduit extending into the chamber and beneath the heater, said conduit being provided with jets for directing currents of oil for rapid circulation about said heater to prevent charring
25 of vegetable material thereon.

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