

June 7, 1955

E. E. FLYNN

2,709,898

AIR HEATING OR COOLING APPARATUS

Filed June 11, 1954

3 Sheets-Sheet 1

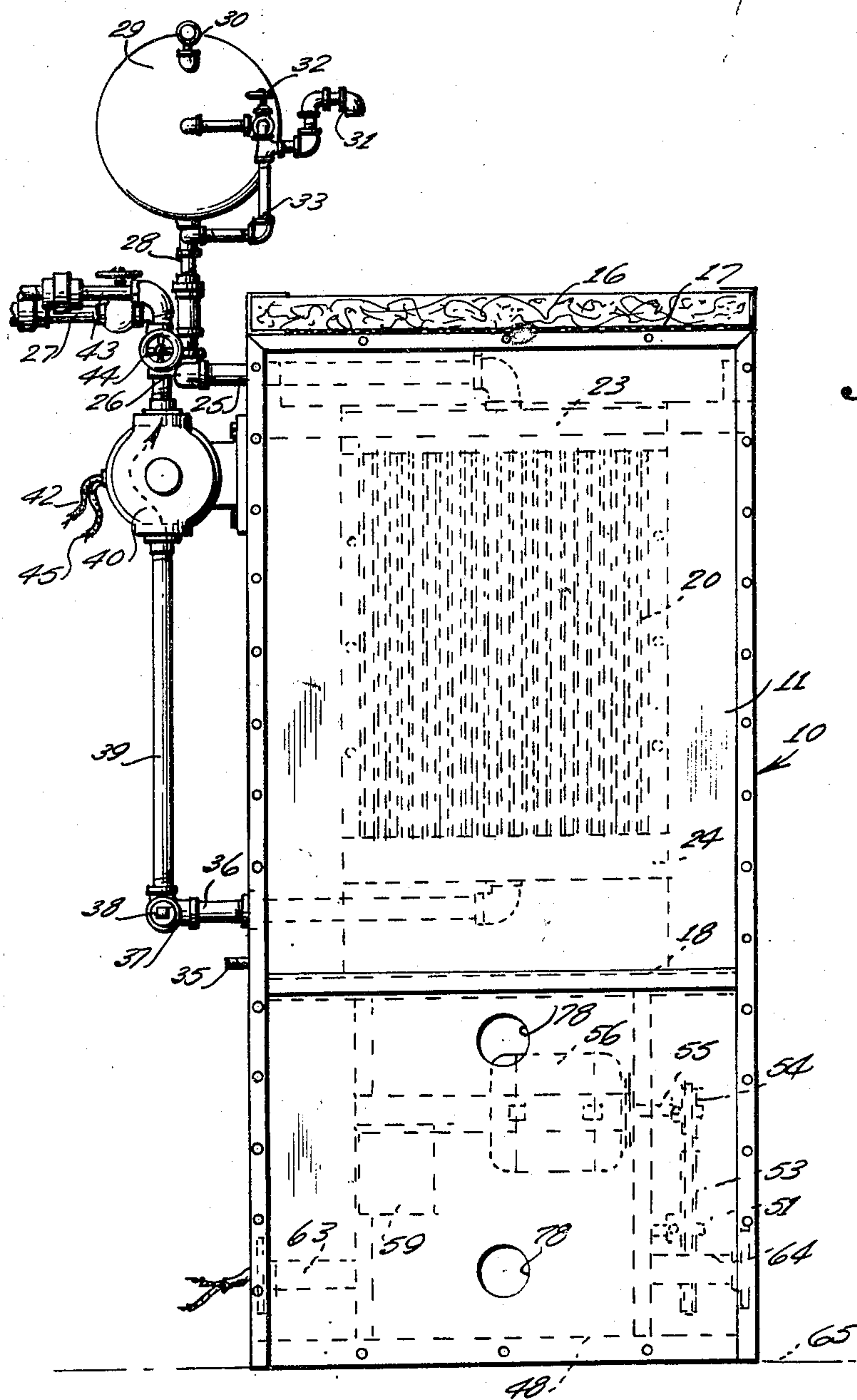


Fig. 1.

INVENTOR.

Etwin E. Flynn

BY *Victor J. Evans & Co.*

ATTORNEYS

June 7, 1955

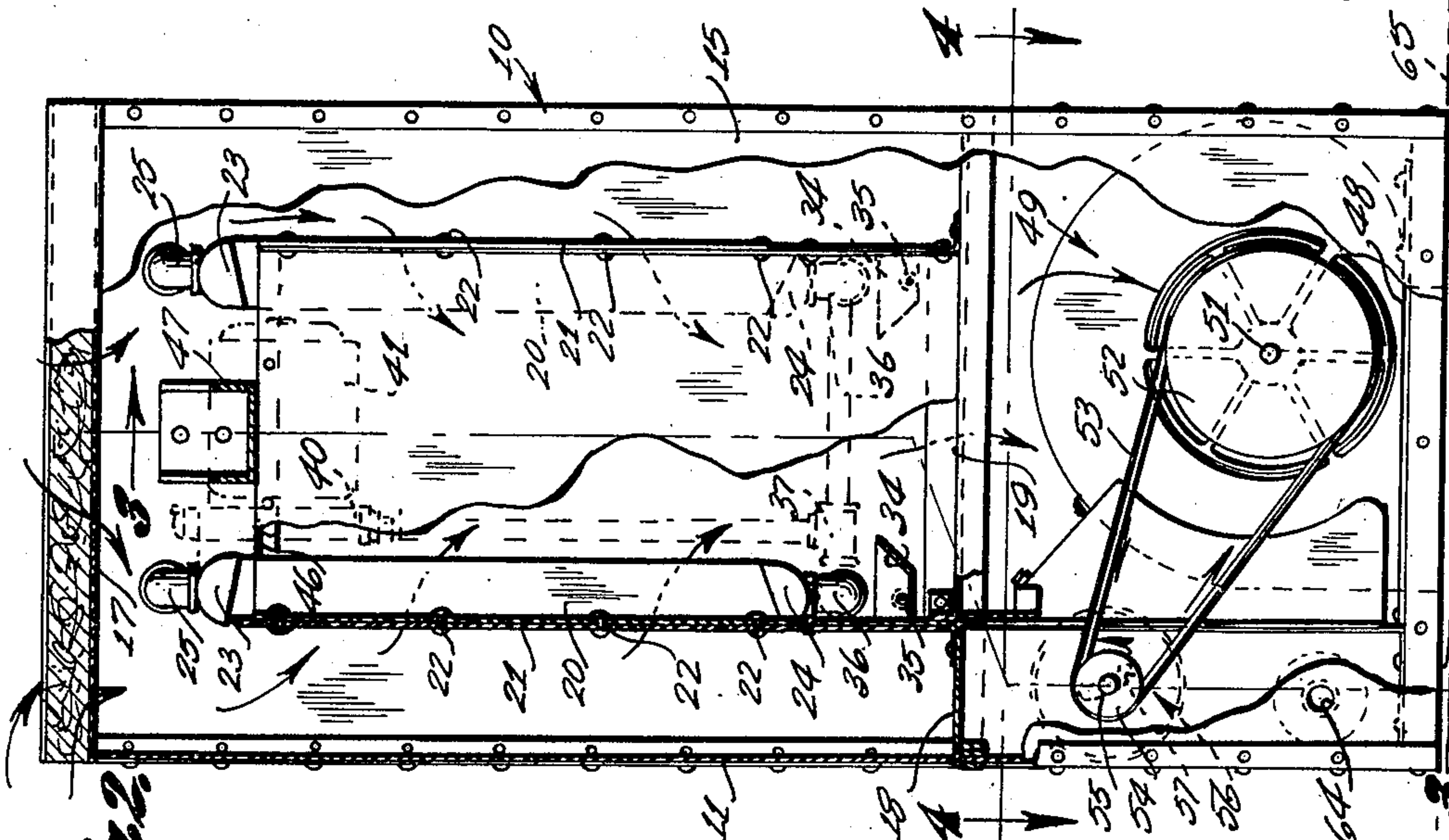
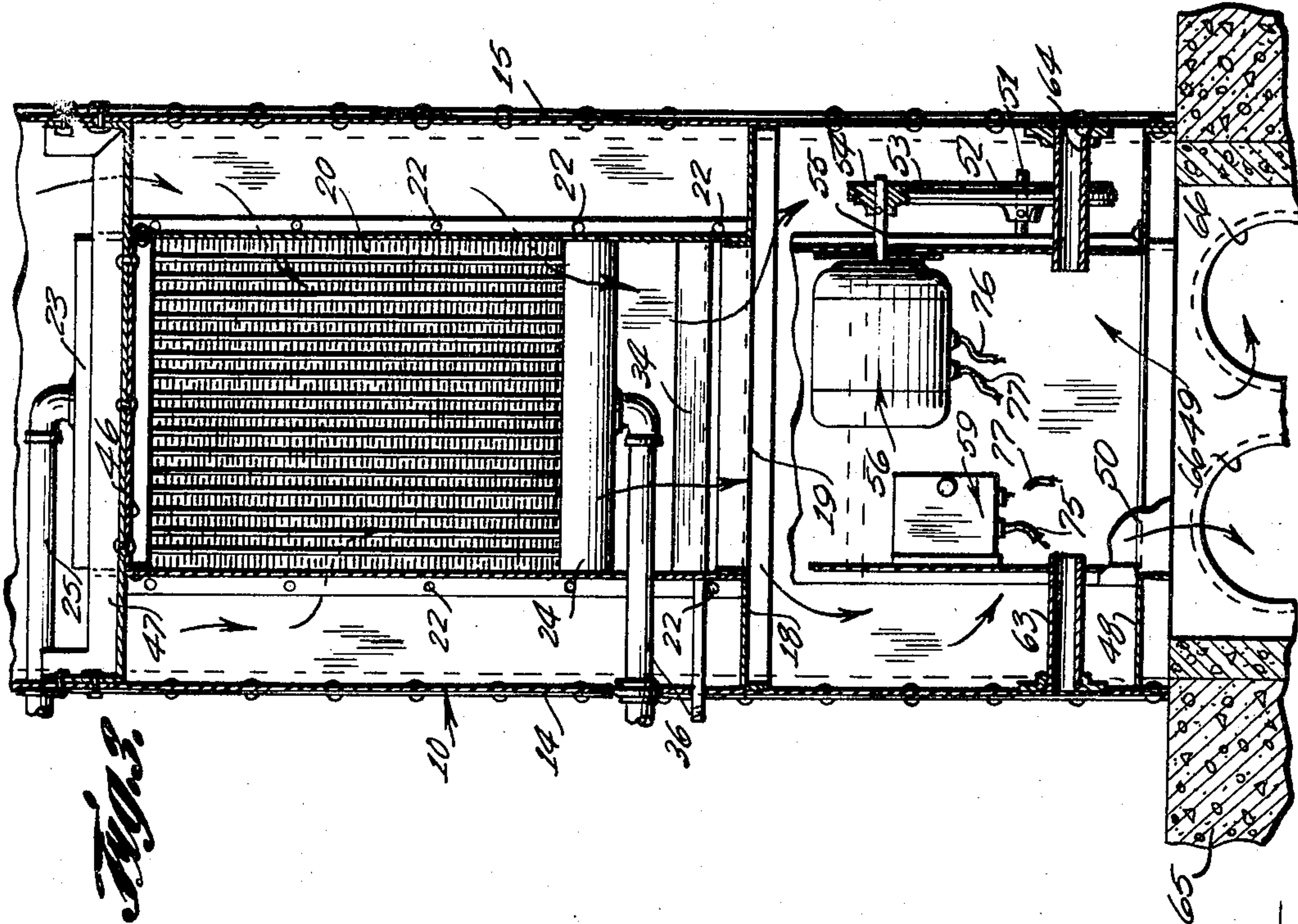
E. E. FLYNN

2,709,898

AIR HEATING OR COOLING APPARATUS

Filed June 11, 1954

3 Sheets-Sheet 2



INVENTOR.

Elwin E. Flynn

BY *Vieta J. Evans & Co.*

ATTORNEYS

June 7, 1955

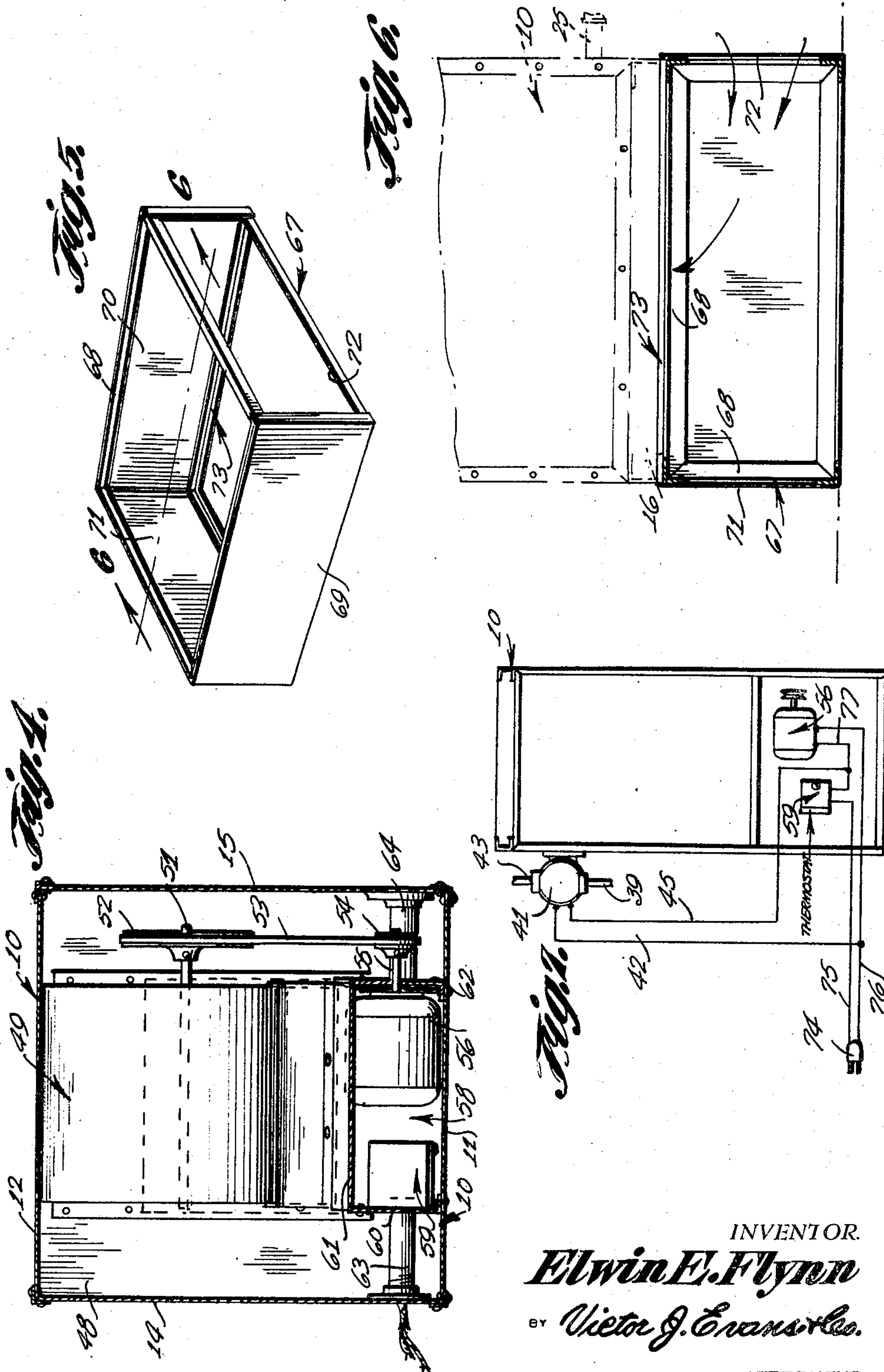
E. E. FLYNN

2,709,898

AIR HEATING OR COOLING APPARATUS

Filed June 11, 1954

3 Sheets-Sheet 3



INVENTOR.
Elwin E. Flynn
BY *Victor J. Evans & Co.*
ATTORNEYS

1

2,709,898

AIR HEATING OR COOLING APPARATUS

Elwin Eugene Flynn, Grand Rapids, Mich.

Application June 11, 1954, Serial No. 436,105

1 Claim. (Cl. 62—6)

This invention relates to an apparatus for heating or cooling air.

The object of the invention is to provide an apparatus which is constructed so that it can be used for either cooling or heating air, there being a filter for removing impurities from the circulating air.

Another object of the invention is to provide an air conditioning assembly for use in a home or business location and whereby a building can either be heated or cooled without any change necessary in the apparatus, the air being drawn or sucked through radiators instead of being blown through the radiators so that there will be no resistance lost, the unit including a motor which is enclosed in a special compartment for safety so that it will be protected from dust and the like.

Another object of the invention is to provide an air treating apparatus which has an air entrance from either the top or bottom, the assembly adapted to be used for homes which do not have a basement or for buildings which do have a basement, the air being filtered as it is circulated so that foreign matter, impurities and the like are removed from the air.

A further object of the invention is to provide an air treating machine which is extremely simple and inexpensive to manufacture.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this application, and in which like numerals are used to designate like parts throughout the same:

Figure 1 is a front elevational view of the air conditioning apparatus, constructed according to the present invention.

Figure 2 is a side elevational view of the apparatus, with parts broken away and in section.

Figure 3 is a sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a sectional view taken on the line 4—4 of Figure 2.

Figure 5 is a perspective view of a base for use when the machine is to be supported above a floor.

Figure 6 is a sectional view taken on the line 6—6 of Figure 5.

Figure 7 is a schematic showing of the wiring diagram for the present invention.

Referring in detail to the drawings, the numeral 10 designates a housing which is hollow and the housing 10 may be made of any suitable material such as metal. The housing 10 includes a vertically disposed front wall 11 and a spaced parallel back wall 12, Figure 4, and the housing further includes spaced parallel vertically disposed side walls 14 and 15. Mounted on top of the housing 10 is a filter 16, and positioned just below the filter 16 is a screen 17. The top of the housing 10 is open so that as shown in Figure 2 the air will follow the path indicated by the arrows and be sucked through the filter 16, and then through the screen 17 into the in-

2

terior of the housing so that all impurities, foreign matter and the like will be removed or filtered from the air.

Positioned within the housing 10 and arranged below the screen is a horizontally disposed platform 18 which is provided with a central opening or cutout 19 through which air passes downwardly as shown by the arrows in Figure 2. Supported above the platform 18 is a pair of vertically disposed spaced parallel radiators or radiator cores 20, and the radiators 20 may be secured to up-
standing support members 21 by suitable rivets or bolt and nut assemblies 22.

Mounted on the upper end of each of the radiators 20 is a header or reservoir 23, while a similar header or reservoir 24 is mounted on the lower end of each of the radiators. Pipes 25 lead from the headers 23 to a T-fitting 26, and a conduit 27 is connected to the fitting 26, the conduit 27 serving to convey fluid such as water which may be hot or cold from a suitable source of supply. A pipe 28 communicates with the conduit 27, and the pipe 28 is connected to a tank 29 which is arranged outside of the housing 10, Figure 1. A pressure gauge 30 is connected to the tank 29, and a drainpipe 31 also communicates with the tank 29, there being a manually operable valve 32 for controlling flow of water through the drainpipe 31. A return pipe 33 may lead from the drainpipe 31 back to the pipe 28 and it is to be understood that suitable valves can be installed in the various pipes through which the water passes whereby this circulating water can be readily manually controlled.

Positioned below each of the radiators 20 is a trough or tray 34 which is adapted to collect or receive condensate or moisture from the radiators, and a discharge pipe 35 extends from each of the trays 34 for permitting the collected moisture to readily drain from the trays 34. Extending from the lower end of each of the radiators 20 is a conduit or pipe 36, and the pair of conduits 36 are connected to a T-fitting 37 which has a manually operable valve 38 arranged therein. A pipe 39 leads from the fitting 37, Figure 1, to a pump 40. The pump 40 is adapted to draw water up through the pipe 39, and the pump 40 is adapted to be rotated or actuated by a suitable electric motor 41, there being wires 42 and 45 connected to the motor 41 for a purpose to be later described. A pipe 43 extends upwardly from the pump 40, and a manually operable valve 44 is interposed in the pipe 43. The pipe 43 serves to return the water back to the storage tank or other locality.

A plate 46 extends between the tops of the radiators 20 for insuring that the air cannot pass down between the tops of the radiators but the air can only pass into the space between the radiators through the ribs of the radiators as shown in Figure 2. A substantially U-shaped support member 47 extends across the top of the plate 46 and is secured thereto, and the support member 47 helps to brace or maintain the parts in their proper spaced or assembled relation, especially when the air conditioning apparatus is inverted as later described in this application.

Arranged in the bottom of the housing is a horizontally disposed shelf 48, and the shelf 48 is provided with a central opening or cutout 50 whereby the treated air can pass therethrough into the building, home or other locality. Supported on the shelf 48 is a conventional blower or fan 49, Figure 2.

A means is provided for actuating or operating the blower 49, and this means comprises a driven shaft 51 which extends from an end of the blower. A pulley 52 is mounted on the shaft 51, and an endless belt 53 is trained over the pulley 52, the belt 53 being also trained over a pulley 54 which is mounted on a drive shaft 55 that extends from an electric motor 56. The shaft 55 ex-

3

tends through an arcuate slot 57 in a suitable plate and the slot 57 permits adjustments to be made on the belt 53 so that the tension thereon can be regulated or adjusted as desired. The motor 56 is positioned in a separate compartment 58 in the housing, Figure 4, and the compartment 58 also has a thermostat 59 situated therein. The compartment 58 is defined by plates 60, 61 and 62. By providing the separate compartment 58 for the motor 56 and thermostat 59, these parts will be protected from dust, dirt and the like, and also they will be safe from children, pets and the like.

Tubes 63 and 64 extend into the housing 10, Figure 3, and these tubes 63 and 64 are adapted to have the various electrical wires extend therethrough which are used for connecting the thermostat and motor to a suitable source of electrical energy. The numeral 65 designates a portion of a concrete floor, Figure 3, and passageways 66 may be provided in the floor 65 the passageways 66 adapted to receive the treated air which leaves the bottom of the housing through the opening 50. These passageways 66 can lead to any suitable locality as for example different rooms in a house or different rooms in an office building so that the cool or warm air can be distributed to wherever it is required or desired. The floor 65 may form part of a building or home that does not have a basement.

Referring to Figures 5 and 6 of the drawings there is shown a base 67 which is adapted to be used for supporting the housing 10 in an inverted position so that the air will be sucked in through the opening 50 and discharged through the filter 16 instead of vice versa as previously described. The base 67 includes a framework that may be made of angle iron 68, and the base 67 includes a pair of spaced parallel vertically disposed side walls 70 and 69, and an end wall 71. One end 72 of the base 67 may be open, and the top of the base may be open so that air can be sucked in through the opening 72. This air will pass through the opening 72 in the base 67, then through the opening 73 in the top of the base 67, and this air will then pass through the filter 16, screen 17, and then through the radiators and finally this air will be discharged through the opening 50 which will now be on the top of the housing, since the housing is inverted.

Referring to Figure 7 of the drawings, there is shown a schematic wiring diagram for the present invention, and the numeral 74 designates a plug which is adapted to be connected to a suitable source of electrical energy. Wires 75 and 76 lead from the plug 74 to the thermostat 59 and motor 56, and a wire 77 interconnects the thermostat 59 and motor 56. Thus, when the temperature exceeds or drops below a predetermined figure, then the thermostat 59 will simultaneously actuate the motor 41 and the motor 56 so that the water will be circulated by means of the pump 40 and also the blower 49 will be actuated by means of the motor 56.

From the foregoing it is apparent that there has been provided an air treating apparatus wherein air that circulates through a home or building can either be cooled or heated depending upon whether the water being supplied to the radiators 20 is hot or cold. The water enters the tops of the radiators 20 through the pipes 25 which are connected to the conduit 27 that leads from a suitable storage area and this water then passes down through the pair of radiators 20 to the headers 24. After the water has given up its heat or cooled the air depending upon the time of the year, the water is removed from the radiators by means of the motor driven pump 40 and this water is returned to the storage tank or the like. The housing 10 may be provided with openings or cutouts 78 whereby some air can enter the compartment 58 to provide ventilation for the electric motor 56. In use, assuming that the house is to be heated, the plug 74 is connected to a suitable source of electrical energy such as a wall outlet, and then the thermostat 59 is set so that if the temperature in a building or home decreases below

4

a predetermined limit, the thermostat 59 will simultaneously actuate the motor 41 and the motor 56. Actuation of the motor 41 will cause the pump 40 to operate whereby water will be circulated through the radiators and through the pipes and thus hot water may be drawn from a hot water heater to circulate through the radiators in the housing. At the same time the motor 56 will cause the blower 49 to rotate whereby air will be sucked in or drawn in through the filter 16 and past the screen 17 and this air will follow the direction of the arrows in Figure 2 so that the air will be sucked through the pair of radiators 20 and this air will then pass down through the radiators through the opening 19 in the platform 18. This air will then enter each end of the blower 49 after which it will be discharged through the opening 50 into the passageways 66 in the floor 65 and the heated air passing through the passageways 66 can be directed to any suitable location. Of course it is to be understood that in hot weather the apparatus can be used for cooling the air simply by passing cold water from a suitable source of supply through the radiators and then when the thermostat 59 reacts to a warm or hot condition, the pump 40 will circulate the cold water through the system and at the same time the blower 49 will suck the air past the cold water contained in the radiators and this cold air will be circulated throughout the building or home to comfortably cool the building.

Instead of arranging the parts as shown in Figures 1 through 4, the entire housing may be inverted and supported on the base 67. This last named arrangement including the base 67 is adapted to be used when the air treating assembly is used in a building having a basement. Thus, as shown in Figure 6 when the base 67 is used, air will be drawn in through the opening 72, then sucked up through the top of the base 67, and this air will be sucked through the filter 16 and screen 17 and then past the radiators and finally this air will be blown out the top of the machine by the blower 49 which will now be on top of the housing since the housing is in an inverted position.

The unit may operate as a regular flow or counter-flow simply by inverting the housing and either end may be considered as the top or bottom. The apparatus will operate off of an ordinary standard size water heater which is found in every modern home and the assembly is economical to operate since water is used as the circulating medium. The assembly is ruggedly constructed and will operate on hot or cold water circulation, and the unit is clean to operate. The blower 49 pulls the air across the radiators so that the resistance set up by the parts is at a minimum whereby the blower can operate more efficiently in forcing the heated or cooled air where it is needed. The assembly will not take up much room or space and the arrangement of the radiators 20 permits an air reservoir to be formed immediately between the inside of the housing sides and the heating or cooling cores of the radiators. Suitable valves are provided in the water system to direct the cold or hot water flow to the respective radiator cores and the expansion tank 29 is used when the hot water is drawn from the home hot water heater for other uses. As shown in Figure 3 the passageways 66 may be in the floor 65 of the building so that extra ducts are eliminated. Further, the various parts can be readily removed or replaced as desired. Heated water can be furnished to the unit from any available source such as gas heaters, oil, coal, atomic energy or hot springs so that the unit will be practical in any community. The base 67 shown in Figures 5 and 6 can be turned or moved whereby the inlet end 72 will face in any desired direction. In the present invention the air is drawn across the heating or cooling elements instead of being blown through the heating elements and this is advantageous since when air is blown across an element there is resistance which results in a loss to the blower force. Also the humidity

5

of the air is not affected so that no extra evaporating equipment is required, but in localities or conditions where the moisture from the condensation becomes excessive, the drip troughs 34 will receive the condensation.

I claim:

In an air cooling or heating apparatus, a housing including vertically disposed spaced parallel front and back walls, and spaced parallel vertically disposed side walls, the top of said housing being open, a screen extending across the top of said housing, a filter mounted above said screen, a horizontally disposed platform positioned below said screen and provided with a central opening, a pair of vertically disposed spaced parallel radiators supported above said platform, a conduit for supplying liquid to the top of said radiators, a tank connected to said conduit and arranged exteriorly of said housing, conduit means connected to the lower ends of said radiators for the passage therethrough of liquid from said radiators, a pump for circulating fluid through said conduit means, a horizontally disposed shelf positioned in

6

the bottom of said housing and provided with a central opening for the passage therethrough of air, a blower supported on said shelf, there being a compartment in the lower end of said housing, a motor positioned in said compartment and adapted to be connected to a suitable source of electrical energy, belt and pulley means connecting said motor to said blower, troughs positioned below each of said radiators for receiving condensate, a thermostat for simultaneously actuating said pump and motor, the air being treated being sucked in through the opening in the top of said housing past the filter and screen and then past the radiators, and then through the openings in said platform, then through the blower and the air being discharged through the opening in said shelf.

References Cited in the file of this patent

UNITED STATES PATENTS

| | | |
|-----------|--------|---------------|
| 1,954,455 | Morse | Apr. 10, 1934 |
| 2,486,226 | Trask | Oct. 25, 1949 |
| 2,529,203 | Turpin | Nov. 7, 1950 |