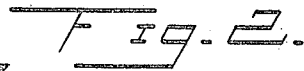
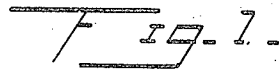


1,407,411.

2 SHEETS—SHEET 1.



Harry Harlow.
By Fred G. Coldren
Attorney

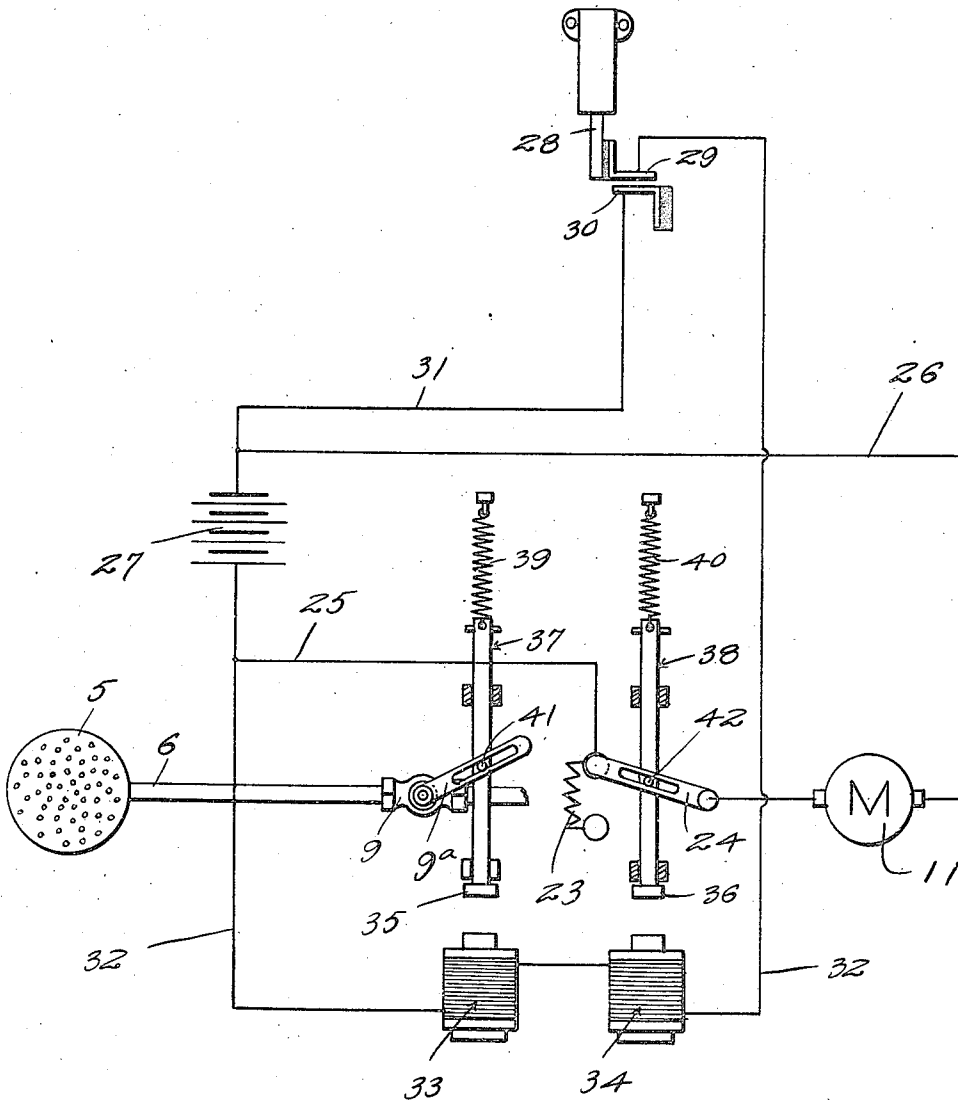
H. HARLOW.
FORCED HOT AIR HEATER.
APPLICATION FILED APR. 29, 1921.

1,407,411.

Patented Feb. 21, 1922.

2 SHEETS—SHEET 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

HARRY HARLOW, OF LOUISVILLE, KENTUCKY, ASSIGNOR OF FOUR-TENTHS TO JAMES MORGAN YEWELL, OF LOUISVILLE, KENTUCKY.

FORCED-HOT-AIR HEATER.

1,407,411.

Specification of Letters Patent. Patented Feb. 21, 1922.

Application filed April 29, 1921. Serial No. 465,562.

To all whom it may concern:

Be it known that I, HARRY HARLOW, a citizen of the United States of America, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Forced-Hot-Air Heaters, of which the following is a specification.

My present invention relates generally to the heating of buildings including residences, apartments, business houses, school buildings and the like and my object is to provide for a regular and healthful heat at minimum cost and labor, under regulation by a thermostat. These objects I preferably attain by the mechanism to be now described and which is shown in the accompanying drawings, forming a part of this application and wherein,

Figure 1 is a top plan view of my improved heating apparatus,

Figure 2 is a vertical longitudinal section taken on line 2—2 of Figure 1, and

Figure 3 is a diagram showing the thermostat and a proposed form of control connections.

Referring now to these figures and particularly to Figures 1 and 2 I have shown a heat receiving and distributing drum 1, receiving through its funnel shaped base 2 heated air from the vertical neck 3 leading through the top of a vertically cylindrical casing 4 within whose base is a burner 5, for instance a gas burner, supplied with gas through a supply pipe 6.

The casing 4 may be supported upon legs 7, secured to its base by bolts 8, and the supply pipe 6 of the burner 5 is preferably provided with a control valve 9 whose slotted control arm 9^a as shown particularly in Figure 3 is swingable between two positions under control of a thermostat in operation, one position being a full open position and the other position being so near to a cut off as to leave but a reduced flame at the burner.

The neck 3 extending to the heat distributing drum 1 forms the upper outlet end of a helical coil 10 within the casing 4, upwardly through which heat from the burner 5 may pass to an outlet pipe 21 extending from the upper portion of the casing for the outflow of the products of combustion of the burner. At the lower end of the coil 10 an air supply pipe 10^a communicates, this pipe leading from a fan casing 10^b within which a fan 14

operates to suck air through the open outer side of the casing and force such air through pipe 10^a and upwardly through the heating coil 10.

Fan 14 is mounted upon the shaft 13 of a motor 11, the latter mounted upon a base 12 and having its operation controlled through a rheostat 23 as shown in Figure 3 which with the swinging slotted arm 24 is in circuit of the motor 11 through wires 25 and 26 and through a suitable source of current 27, in order that the action of the motor and consequently the action of the fan 14 may be automatically controlled from a thermostat.

I have shown the thermostat at 28 in Figure 3, controlling one contact 29 movable into and out of engagement with a stationary contact 30, the latter connected to one side of the source of current to a wire 31, and the former connected by a wire 32 to the opposite side of the source of current, through electro magnets 33 and 34. These electro magnets upon energization, attract armatures 35 and 36 respectively in connection with controlling slides 37 and 38, having springs 39 and 40 which normally operate to hold the slides in attracted position with the armatures 35 and 36 spaced from the electro magnets.

The control slides 37 and 38 have pins 41 and 42 extending into the slots of the arms 9^a and 24 which respectively control the gas supply valve 9 and the motor 11 so that when the armatures 35 and 36 are attracted by and toward the electro magnets 33 and 34 the valve arm 9^a will be shifted to the partially closed position and arm 24 will be shifted on the rheostat 23 to the position effecting slow speed of the motor 11. This action takes place each time the contacts 29 and 30 come together by virtue of movement of the former with the thermostat 28 and results of course in decreased supply of heated air to the distributing drum 1 in view of the decreased speed of the fan 14 as well as the decreased heat supply of the burner 5.

It is to be understood that the controlling features shown in Figure 3 are illustrated and described simply as an example of the manner in which the thermostat may function, and that I reserve the privilege of substituting other control means of any suitable nature adapted and intended to bring about similar results.

It is also understood that by virtue of the coil 10 and its direct connection to the heating drum 1 from which heated air is forced through distributing pipes 15, 16, 17, 18, 19 5 and 20 to various rooms or parts of a building, the air under the forced draft of fan 14 can effectively move along its prescribed path of travel without back pressure. It is due to this fact that a motor of small capacity is sufficient for all ordinary purposes 10 and the apparatus provided by my invention is capable of economical use in so far as its consumption of current is concerned. It is also due in part at least to the use of a helical coil within the casing 4, upwardly 15 through which heat products from the burner 5 may pass that air in its passage through the heater may be effectively heated for all ordinary purposes with but modest 20 consumption of gas and under perfect control of the thermostat so that a uniform heat will be maintained which considering the nature of the heat, heated pure air, provides for an especially effective and healthy heating of human habitations. 25

I claim:

1. A forced hot air heater including a casing, an air heating coil rising therein, a funnel shaped heat distributing drum above 30 the casing and to the lower smaller end of

which the upper end of the coil is connected, heat distributing pipes leading from the upper larger end of said drum, a burner in the lower portion of the casing having a 35 valved supply pipe, a fan casing connected to the lower end of the heating coil, a fan therein, a motor actuating the fan, and a thermostat controlling the supply of heated air, as described.

2. A forced hot air heater comprising a 40 vertical cylindrical casing, a helical air heating coil rising in said casing, a distributing drum above the casing having distributing pipes and a funnel-shaped base connected to the upper end of the coil, a burner in the 45 lower portion of the casing having valve controlled fuel feed means, a motor actuated fan for forcing air into the lower end of the coil having a circuit including a source of current and a switch, and a heat controlling thermostat in circuit with the fan and 50 employing the said source of current thereof, said thermostat having connections simultaneously controlling the valve of the fuel feed means and the switch of the motor, 55 all as described.

In testimony whereof I have affixed my signature.

HARRY HARLOW.