

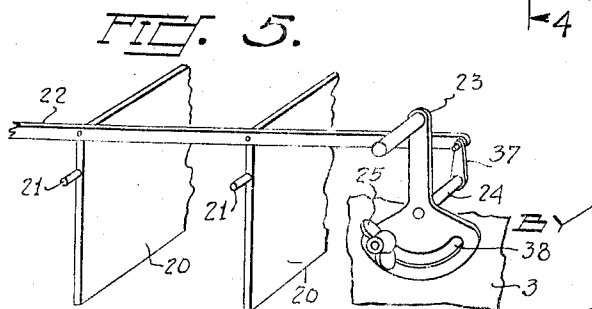
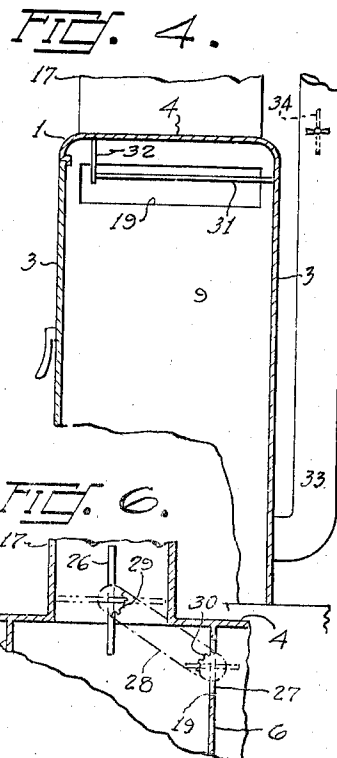
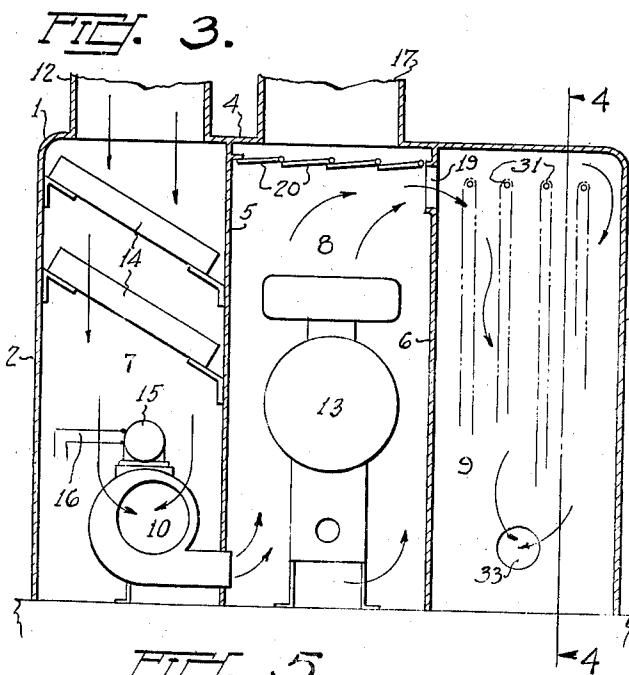
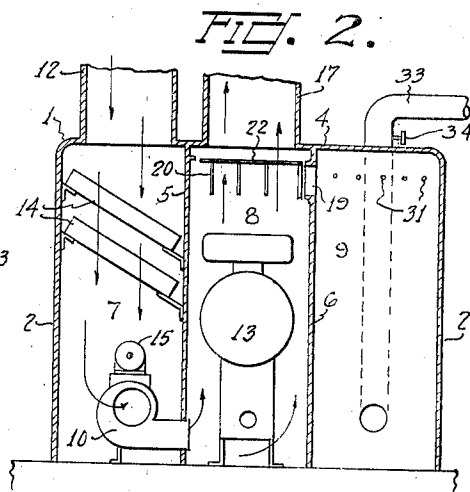
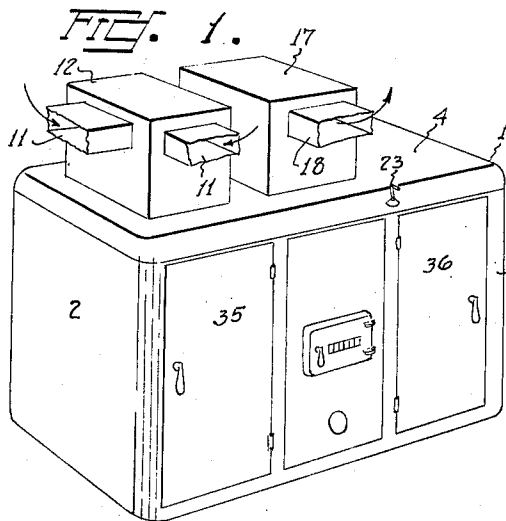
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COMBINATION HEATING AND DRYING UNIT

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COMBINATION HEATING AND DRYING UNIT

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Application August 28, 1939, Serial No. 292,202

1 Claim. (Cl. 34—19)

This invention relates to a combined heating and drying unit, such as may be used for the dual purpose of heating a dwelling and for drying clothes and the like, and has particular reference to a combination air conditioning and heating unit and clothes drier, wherein an air stream is first cleansed of dust particles, soot and the like, and heated, and thereafter delivered into a drying chamber for drying clothes and/or into the usual channels for heating purposes.

The drying of clothes after they have been washed is often attended with considerable difficulty. Particularly is this true in those sections of the country where certain seasons are characterized by the presence of moisture-laden fogs, or by a considerable rainfall. When such conditions prevail, it is often impossible to dry clothes out-of-doors, and the presence of rain or fog-laden atmosphere burdens the housewife with the arduous, discomforting task of drying clothes indoors. Moreover, the presence of smoke-filled or soot-laden atmospheres, such as prevail in those sections of the country largely occupied by manufacturing industries, contributes materially to the inadvisability of hanging wet clothes out-of-doors to dry, even in favorable weather. In modern homes, where no unused attic is available which may be occupied by clothes lines, and in which the basement, if any, has become a recreation room, no provision is made for drying clothes, which, in drying, give to the whole house a damp, disagreeable atmosphere.

In offering a solution to this almost universal problem, applicant has kept in mind the prerequisite requirements that the drying unit shall occupy an absolute minimum amount of space, that it shall function to dry clothes with heat losses reduced to a degree commensurate with an appreciable saving in the drying time, and that the clothes dried shall be sweet and clean and free from taint of odors ordinarily absorbed when the clothes are dried indoors. Also that the dried clothes be relieved of their moisture content by intimate contact with a sufficient volume of dry, clean air to rapidly absorb and carry away the moisture content of the clothes and leave them as soft and as fragrant as if dried under the most favorable out-of-doors conditions.

To the accomplishment of these requirements, applicant has designed and is engaged in the manufacture of combined heating and drying units, each of which houses within one shell an air conditioning unit, a furnace, and a drying unit; together with a fan or blower for deliver-

ing therethrough a volume of air sufficient to at once heat the dwelling and dry clothes which may be hung in the drying compartment, and having incorporated in the unit directional means for selectively determining the proportional volume of heated air to be delivered to heat the dwelling and/or to dry the clothes.

It is, therefore, an object of the invention to provide, in combination, an air conditioning and heating unit, and a unit for drying clothes, with means for delivering therethrough a volume of heated air, and means for directing the heated air either into a space to be heated or into intimate contact with clothes to be dried.

It is a further object of the invention to provide, in a single unit, an air conditioning and heating unit and clothes drier, together with means for delivering therethrough a volume of air sufficient to heat a predetermined space and/or dry a quantity of wet clothes, and directional means for selectively determining the proportional volume of heated air to be delivered into said space and/or into said drier.

It is a further object of the invention to provide, in a single unit, a construction embodying an air conditioning and heating mechanism, and clothes drier, together with means for creating and directing a volume of air sufficient to heat a predetermined space and/or dry a quantity of wet clothes.

With these and other objects in view, to be more clearly understood as the description proceeds in connection with the accompanying drawing, the invention resides in the novel construction and combination of parts hereinafter described, illustrated in the accompanying drawing and set forth in the appended claim; it being understood that various changes in form, proportion, size and details of construction, within the scope of the claim, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawing:

Figure 1 is a perspective view of a combination air conditioning and heating unit and clothes drier, embodying the principles of the present invention.

Figure 2 is a front elevation of the unit shown in Figure 1, with the front panel or cover removed, and showing the locations of the respective air conditioning, heating, and clothes drying elements. The volume of air created by the fan or blower is indicated as being delivered to a hot air heating system.

Figure 3 is similar to Figure 2, except that the

volume of air created by the fan is indicated as being delivered to the drying compartment for drying clothes.

Figure 4 is a sectional elevation of the unit, taken on the line 4—4 of Figure 3.

Figure 5 is a fragmentary view of the shutters and operating mechanism therefor, by means of which the heated air is directed to a hot air heating system and/or to the drying compartment.

Figure 6 is a fragmentary detail of a modified form of mechanism for directing the heated air into the desired channels.

As illustrated in the drawing, the unit comprises a shell or casing 1 having vertical end and side walls or panels 2 and 3 and a top or cover 4. Within the shell or casing are vertical partitions 5 and 6 which divide the interior of the unit into three chambers or compartments 7, 8 and 9. Mounted within one of the side compartments is the mechanism for creating and cleansing a volume of air. In the illustrated embodiment of the invention, this mechanism is mounted in compartment 7 and comprises a fan or blower 10 which operates to draw air into the compartment 7 by way of supply pipes 11 and an intake box 12, and to deliver it therefrom into the middle compartment 8 wherein is housed a furnace 13. The cold air supply pipes 11 which lead into the intake box 12 may be the usual cold air returns from the interior of the building, or may supply air to the unit from outside of the building, or both. Upon entering the compartment 7, the air stream is cleansed of dust particles, soot and similar foreign matter by being drawn through air filters 14. The fan 10 is operated by an electric motor 15 which is energized by way of wires 16 leading from a thermostatically controlled switch (not shown). The heating unit or furnace 13 may be of any type or construction suitable for heating the required volume of air, and may be fired by any kind or type of fuel and employ any type of burner. In this particular, therefore, the drawing is intended only as a more or less schematic illustration of a heating unit. The volume of air delivered by the fan 10 is forced upwardly through the compartment 8, and is heated by intimate contact with the walls of the furnace as it spreads thereover. At the top of the middle compartment 8 is the output or distributor box 17 which distributes the heated air to the hot air pipes 18 leading therefrom, which in turn deliver it to the several rooms of the building to be heated.

In the upper end of the partition 6 which separates the furnace compartment 8 from the drying compartment 9 is an opening 19 through which the heated air from the furnace compartment may be directed into the drying compartment. This opening 19 is of sufficient size to permit ready passage therethrough of the volume of air created by the fan 10. In consideration of the fact that the drying compartment is used only for drying periods which are separated by relatively long intervals of time, and the fact that during seasons of cold weather hot air is delivered to the house almost continuously, it may be said that normally the opening 19 is closed and the heated air is directed upwardly through the distributor box 17 and into the pipes 18. During those periods of time, however, when it is needful to deliver a flow of dry, heated air to the drying compartment, as when wet clothes are placed therein to be dried, the closure member is removed from the opening 19 and the heated air is directed into the drying compartment. At the same time

the distributor box 17 may be closed off from the furnace compartment 8 by the same or a similar closure member which operates to close and open the opening 19.

In the preferred embodiment of the invention the unit is equipped with shutters 20 arranged across the upper end of the compartment 8 which serve as directional means for selectively determining the proportional volume of heated air to be delivered to the distributor box 17 and to the drying compartment 9. Each shutter 20 is pivotally mounted upon stub shafts 21, about which pivotal points the shutters are turned by means of an actuating bar 22 which interconnects the several shutters at a point somewhat remote from their respective pivots. Lateral movement of the actuating bar 22 serves to turn the shutters 20 on their respective pivots, and so determines the angle at which said shutters are disposed. Normally, as illustrated in Figure 2, the shutters are hung in vertical position, in which position the heated air is permitted to flow into the distributor box 17, the shutter adjacent the partition 6 meanwhile covering the opening 19 and preventing the delivery of heated air into the drying compartment. Figure 3 illustrates the positions of the shutters 20 when they have been actuated to close the entrance to the distributor box 17 and cause delivery of the entire volume of heated air into the drying compartment 9. It will be understood, of course, that by proper manipulation of the actuating bar 22, the shutters 20 may be disposed at any angle intermediate the positions illustrated in Figures 2 and 3, for permitting a portion of the volume of air created by the fan 10 to be delivered to both the distributor box 17 and to the drying compartment 9. The actuating bar 22 may be controlled by means of a crank 23, the latter being designed to rotate a shaft 24 to which the bar 22 is connected by a link 37. The crank 23 is held in a selected position by means of a thumb nut 25 threaded onto a stud bolt which projects through an arcuated slot 38 in the crank.

In Figure 6 is illustrated a modified form of mechanism for selectively determining the proportional volume of heated air to be delivered to the distributor box 17 and to the drying compartment. This mechanism comprises the use of closure members which separately operate to close and open the entrance to the distributor box 17 and the opening 19 through the partition 6, respectively. These closure members are in the form of dampers or movable plates 26 and 27, the plate 26 being positioned within the lower portion of the distributor box 17, so that, when horizontally disposed, it serves to prevent the delivery of air from the furnace compartment 8 to the distributor box. The plate 27 is positioned in the opening 19, so that, when vertically disposed, it serves to prevent the delivery of air from the furnace compartment 8 to the drying compartment 9. The plates 26 and 27 are arranged for simultaneous movement about their axes by means of a chain 28 trained around sprocket wheels 29 and 30 operatively secured to the respective plates. Both plates 26 and 27 are actuated simultaneously, and are so arranged that when one opening is closed, the other is open, and vice versa. This arrangement is shown in dotted line in Figure 6, the plate 26 being illustrated therein as in position to close the entrance to the distributor box 17, whereas the plate 27 is in open position.

The drying compartment 9 is equipped with

drying bars 31 disposed horizontally at the top of the compartment, these being slidably or removably mounted on a rack 32 in any suitable manner. Communicating with the lower portion of the compartment 9 is a pipe 33 through which the air from the drying compartment is exhausted to the outside atmosphere, as through a flue (not shown). It will be noted that the cross sectional area of the pipe 33 is considerably less than the area of the opening 19 in the partition 6, by reason of which the air within the drying compartment is under sufficient pressure above atmospheric, due to the difference in the area of the inlet and outlet openings, to assure an intimate contact of every portion of the wet clothes with the drying air. Moreover, the heated air is forced downwardly from the inlet opening 19 at the top of the compartment 9 to the outlet in the lower portion thereof, and this arrangement, together with the fact of the pressure created in the compartment, assures an absence of areas or pockets into which the heated air is not delivered. Thus provision is made for an even distribution of the drying air into all portions of the compartment in sufficient volume to absorb and carry away the products of evaporation therewithin. A damper 34 in the pipe 33 may be used to further restrict the flow of air through said pipe whereby, although a considerable volume of air may be admitted to the compartment 9, only a portion thereof is permitted to be exhausted therefrom through the pipe 33. This arrangement is particularly advantageous when the greater part of the water content of the clothes shall have been evaporated and carried away, and a lesser volume of air is neces-

sary thereafter to complete the drying operation.

Each of the compartments 7 and 9 are made accessible by means of removable panels or doors 35 and 36, the middle compartment 8 being closed except for the inlet and outlet orifices hereinbefore referred to.

Having now described my invention and in what manner the same may be used, what I claim as new and desire to protect by Letters Patent is:

A unitary heating and drying device comprising walls forming a casing enclosing heating and drying structure, partitions in said casing arranged to provide three chambers therein, two of said chambers being end chambers, and one of said chambers being a central chamber between said end chambers, one of said end chambers having an air intake opening in the upper portion thereof, an air filter below said intake opening, and a blower in the lower part of said chamber for circulating filtered air into the lower part of said central chamber, a furnace in said central chamber, said central chamber having a hot air discharge opening in the upper portion thereof leading out of said closed casing for supplying hot air for a room to be heated, a second hot air discharge opening located in the upper part of said central chamber for supplying hot air to the other end chamber, drying racks in said other end chamber, an air discharge opening in said last mentioned chamber, and variable damper means to selectively control the ratio of hot air delivered to each of said hot air discharge openings in said central chamber.

WILLIAM K. FOX.