Oct. 1, 1935. T. I. MOSELEY 2,015,956

HAIR DRYING APPARATUS

Filed May 29, 1934 3 Sheets-Sheet 1

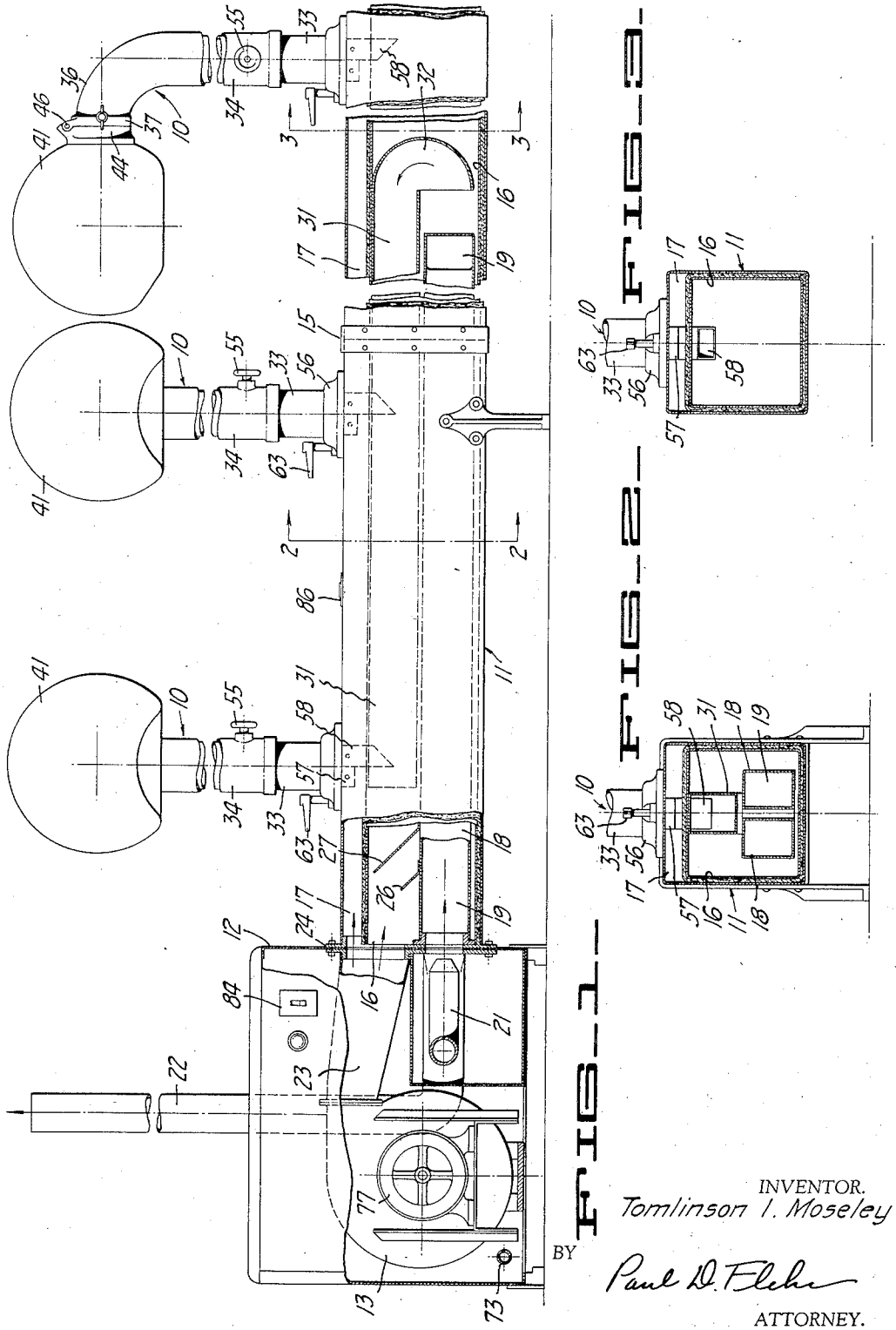


FIG. 1.

FIG. 3.

FIG. 2.

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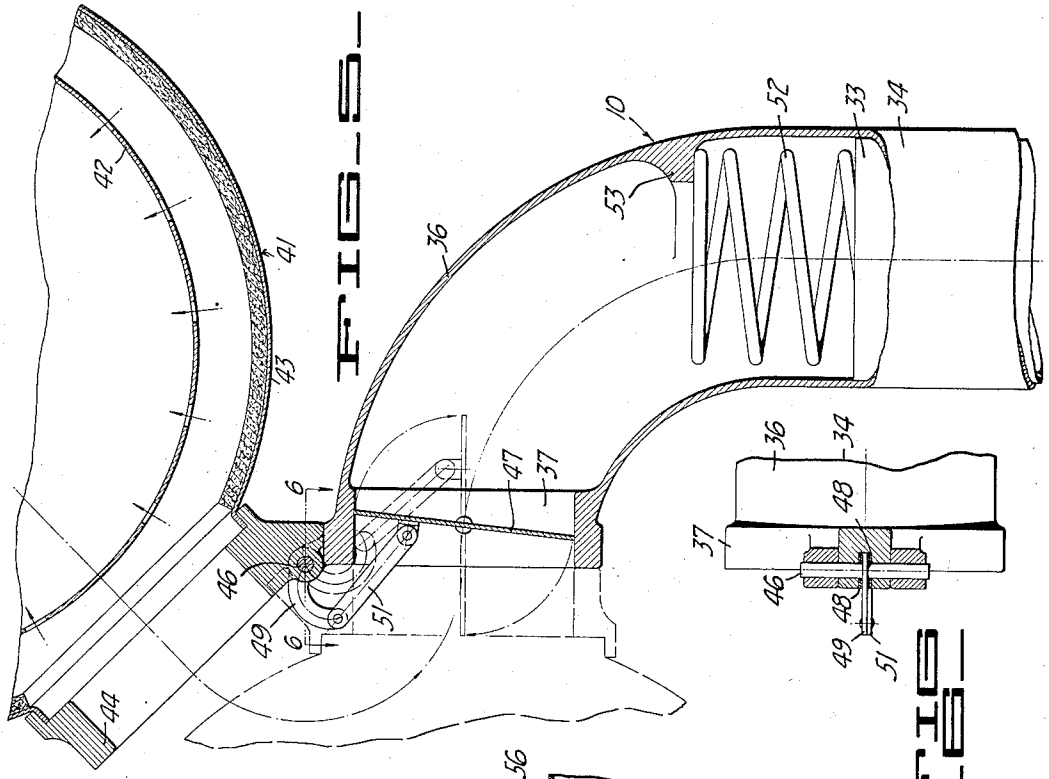
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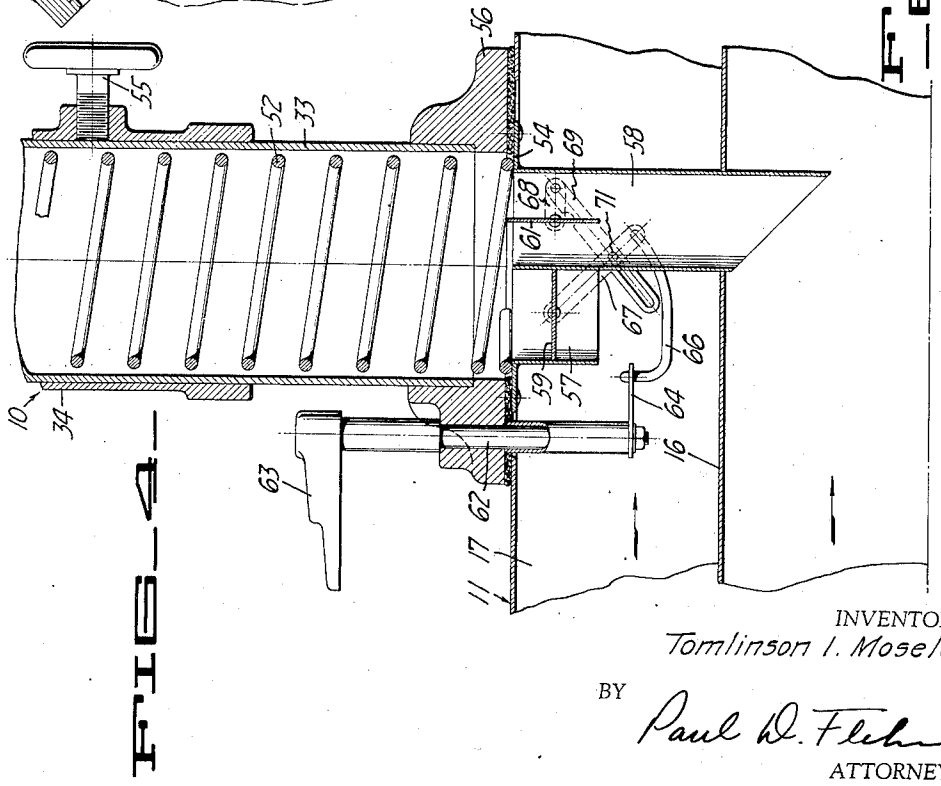
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HAIR DRYING APPARATUS

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HAIR DRYING APPARATUS

Filed May 29, 1934 3 Sheets-Sheet 3

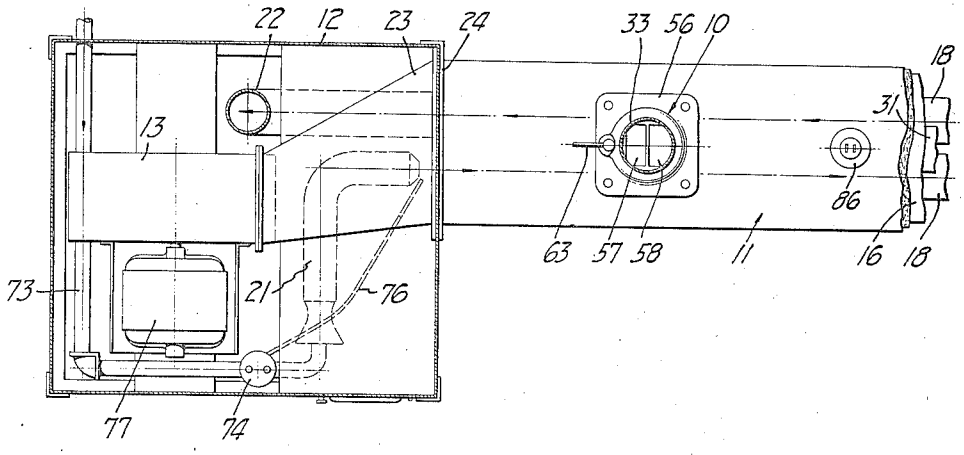
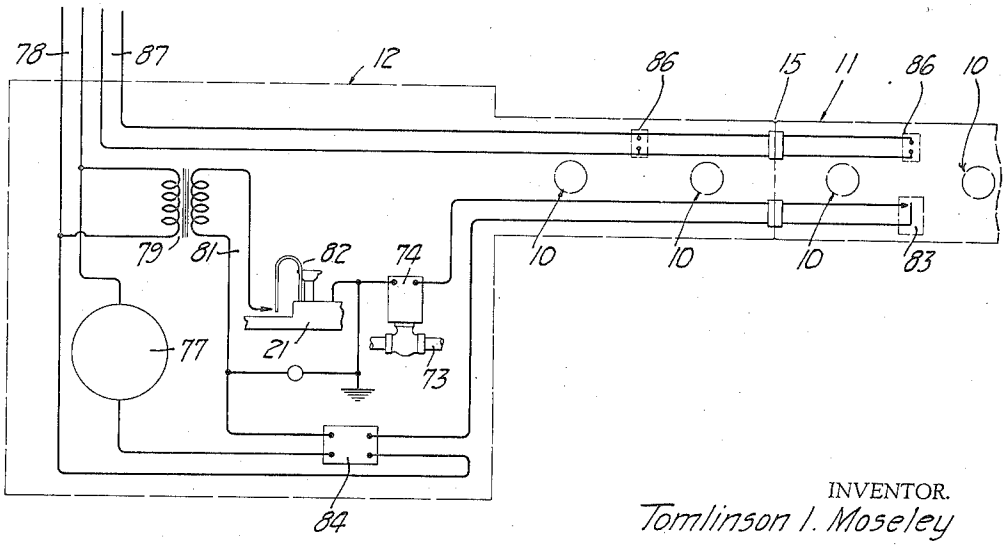


FIG. 7

FIG. 8



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HAIR DRYING APPARATUS

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Application May 29, 1934, Serial No. 728,074

8 Claims. (Cl. 34—26)

This invention relates generally to apparatus for drying human hair, such as are useful in commercial beauty parlors.

In the past it has been common in beauty parlors to employ individual portable units for the drying of hair, each unit consisting of a fan or blower, an electrical air heater, and air delivery means for directing the heated air upon a head of hair. In a large shop a large number of such units involves a considerable capital investment, and the electrical power load drawn becomes excessive. In place of such individual units, it has been proposed to employ a single blower installation, connected to a plurality of air distributors. Prior to my invention, such apparatus has met with indifferent success, due to lack of flexibility in making installations, failure in properly equalizing temperatures for the different distributors, and to the absence of proper control. Likewise, such installations, if they utilize an electrical source of heat, are expensive to operate.

It is an object of the present invention to provide a successful hair dryer of the type utilizing a single blower with a plurality of distributors, which will avoid the difficulties outlined above.

More specific objects of the invention are as follows: To provide automatic means for shutting off flow of air to a distributor which is not in use; to provide a selective adjustment under the control of an operator whereby the temperature of the air supplied by any one distributor can be varied over a wide range; and to facilitate manufacture of standardized parts which can be assembled to provide installations meeting the varying demands of different shops.

Further objects of the invention will appear from the following description in which the preferred embodiment of the invention has been set forth in detail in conjunction with the accompanying drawings.

Referring to the drawings:

Fig. 1 is a side elevational view, partly in cross-section, illustrating apparatus incorporating the present invention.

Fig. 2 is a cross-sectional detail taken along the line 2—2 of Fig. 1.

Fig. 3 is a cross-sectional detail taken along the line 3—3 of Fig. 1.

Fig. 4 is an enlarged cross-sectional detail illustrating the valve means which I preferably utilize for automatically shutting off supply of air to a distributing unit.

Fig. 5 is an enlarged cross-sectional detail illustrating the manner in which the air tube of each distributing unit communicates with the cold and hot air header conduits, and the single manipulation valve means for selectively controlling the supply of air to the distributing units.

Fig. 6 is a cross-sectional detail, the section being indicated by the line 6—6 of Fig. 5.

Fig. 7 is a detail in plan, showing the blower installation and a part of the heating unit associated with the same.

Fig. 8 is a circuit diagram for the electrical parts of my apparatus.

Referring first to Fig. 1, my apparatus consists of a plurality of air distributors or distributing assemblies 10 which are connected to an elongated housing 11. One end of this housing connects with a box-like casing 12 which serves to house the air blower 13. As shown more clearly in Figs. 2 and 3, the housing 11 is formed of suitable material such as sheet metal, and may be square or rectangular in cross-section. Fitted within this housing there is a heat-insulated conduit 16, the upper wall of which is spaced from the top wall of the housing to form an upper interior passage or conduit 17. As will be presently explained, conduit 16 is for the purpose of conveying heated air, while conduit or passage 17 conveys cold or unheated air. Both of these conduits preferably extend for substantially the entire length of the housing. In order to facilitate manufacture and to afford flexibility in making installations, the housing, and also the walls of conduit 16, are formed in separable sections coupled together by the junctions 15.

In order to heat air discharged by the blower 13, there is a heater which, for economy of operation, preferably utilizes fuel gas. Thus there is shown an elongated U-shaped heater tube 18, forming a continuous U-shaped passage 19, and disposed in the lower part of housing 16 (Fig. 1). One branch of this tube is associated with a gas burner 21, while the other branch is connected to a flue pipe 22. Propagation of a fuel flame through tube 18, together with the passage of hot products of combustion, causes the walls of the tube to be heated to an elevated temperature, thus transferring heat to the surrounding air. The delivery pipe 23 of blower 13 communicates with the housing 11 at the junction 24 between this housing and the casing 12. It will be noted from Fig. 1 that a part of the air stream is discharged into the cold-air conduit 17, and another part into the hot-air conduit 16 immediately above the heater tube 18. In order to secure better contact between the stream of air and the walls of the heater tube 18, deflectors or baffle plates 26 and 27 are mounted upon the

heater tube 18 (Fig. 1). These baffle plates direct the stream of air downwardly about the walls of the heater tube.

In order to secure an equalized distribution of hot air, it is desirable not to supply the distributors 10, which are relatively close to the heater tube 18, with hot air directly from the conduit 16. Therefore, immediately overlying the heater tube 18 and within the conduit 16, there is a secondary conduit 31. That end of the secondary conduit which is nearest the blower end of housing 11 is closed, while the other end terminates in a scoop-like air diverter 32. This diverter receives a part of the heated air leaving the heater tube 18 and returns it back through the secondary conduit.

The individual distributor assemblies 10 may vary in construction, but, as illustrated, each unit consists of an upright pipe 33 which is mounted upon the upper wall of housing 11. Telescopically engaging the pipe 33 there is another pipe 34, the upper end portion 36 of which is bent forwardly to form an air outlet 37. The air delivery device carried by outlet 37 may be in the form of a hood 41, consisting of an inner perforated wall 42 and an outer imperforate shell 43. The space between these walls is in communication with an opening through collar 44, which in turn is hingedly connected to the outlet 37 by means of pin 46. With such an arrangement, the hood 41 can be swung upwardly to an out-of-the-way position as shown in full lines in Fig. 5, or downwardly as shown in dotted lines, to bring the opening in collar 44 in registry with outlet 37, with the hood embracing a head of hair to be dried.

When only a part of the distributors are in operation, the hoods 41 of the remainder are swung upwardly to out-of-the-way positions. It is desirable to shut off supply of air to units not in operation, both for the sake of economy and in order to avoid undue heating of the room in which the apparatus is installed. Rather than to rely on a valve which must be manually opened or closed by the operator, I provide a valve which is automatically operated by swinging movement of the hood. Thus, as shown in Fig. 5, I privide a pivoted butterfly valve member 47 within the outlet 37. Carried by the pivot pin 46, between the spring washers 48, there is an arm 49. The free end of this arm is connected to the butterfly valve member 47 by link 51. During initial downward swinging movement of hood 41 about the position shown in solid lines in Fig. 5, arm 49 likewise rotates by virtue of a frictional engagement afforded by spring washers 48. Such movement of arm 49 effects opening of valve member 47. After valve member 47 has been moved to full open position, arm 49 ceases to rotate, although downward swinging of the hood may be continued to the operating position illustrated in dotted lines. Conversely, when the hood 41 is swung upwardly to an out-of-the-way position, initial upward swinging movement causes immediate closing of the valve member 47.

The telescopic engagement of pipes 33 and 34 enables a vertical adjustment of each hood. In order to counterbalance the weight of the adjustable parts, each assembly is shown provided with an inner compression spring 52, the upper end of which is seated upon a lug 53, and the lower end of which is seated upon a ledge 54. Pipe 34 can be retained in any desired vertical position by means of set-screw 55.

The means for establishing communication between the lower end of each pipe 33 and the conduits within housing 11, is shown in detail in Fig. 4. Thus, the lower end of each pipe 33 is mounted upon an annular flange 56, which in turn is secured to the upper wall of housing 11. Depending from the underside of flange 56 are the stub conduits or ducts 57 and 58. Conduit 57 serves to establish communication between the cold-air conduit 17 and pipe 33, while conduit 58 serves to establish communication with the hot-air conduit 16. The lower end of stub conduit 58 can be cut off at an angle, as illustrated, in order to more effectively divert air into the same.

In order to selectively control the flow of cold and hot air through the stub conduits 57 and 58 to pipe 33, I have shown means including a pair of pivoted butterfly valve members 59 and 61. Journaled in one side of flange 56 there is a vertical shaft 62, the upper end of which carries a manipulating handle 63. Secured to the inner end of shaft 62 there is an arm 64 which in turn is connected to one end of link 66. Secured to the pivot pin for valve member 59 there is an arm 67, the free end of which is likewise connected to link 66. Therefore, upon rotation of shaft 62 arm 67 may be swung through 90° to effect opening and closing of valve member 59. In order to effect operation of valve member 61 by the same manipulating handle 63, the pivot pin for this valve member is secured to an arm 68 which in turn is pivotally connected to link 69. A pin and slot connection 71 serves to connect link 69 to arm 67. With the valve members 59 and 61 positioned as shown in Fig. 4, only hot air will be supplied to the pipe 33 through stub conduit 58. As arm 67 is rotated in a clockwise direction by rotation of manipulating handle 63, partial opening of valve member 59 occurs, to permit entry of cold air to blend with the heated air. Movement of arm 67 beyond the limits of the pin and slot connection 71 causes closing movement of valve member 61, so that when valve member is in full open position, valve member 61 is closed. Thus it is apparent that by selectively positioning handle 63, either cold or hot air may be delivered to pipe 33, or the cold and hot air streams may be intermixed in varying proportions.

In Fig. 4 the stub conduit 58 is shown communicating through the upper wall of the hot air conduit 16. For those distributing units located relatively close to the heater tube 18, as for example the first two units as illustrated in Fig. 1, the stub conduit 58 communicates with the secondary hot-air conduit 31.

While, if desired, the supply of gas to the burner 21 can be controlled manually, I preferably provide an automatic control utilizing a thermostat. Thus, in Fig. 7 the gas supply pipe 73 to the burner 21 connects through an electrically operated valve 74. The burner is also provided with a suitable pilot burner which is supplied with gas through tube 76. Electrical connections for the electrically-operated valve 74, and also for the driving motor 77 of the blower, are shown in Fig. 8. Thus, the current supply lines 78 serve to supply current to the primary of a step-down transformer 79. The low-voltage secondary circuit 81 of this transformer includes the contacts of a pilot thermostat 82, the windings of the electrically operated valve 74, and the contacts of a control thermostat 83. The blower motor 77 is adapted to be connected directly across the lines 78 by the starting switch 84.

Switch 84 also carries a pair of contacts whereby when the motor circuit is opened the control circuit 81 is rendered inoperative. As has been indicated diagrammatically in Fig. 8, thermostat 83 is located at some suitable point within the hot-air conduit 16, preferably a considerable distance beyond the end of the heater tube 18. When the temperature of the heated air increases beyond a predetermined desired value, the contacts of thermostat 83 are opened, to cause closing of the electrically operated valve 74 and to extinguish the main burner flame. When the temperature of the heated air falls below a predetermined value, the contacts of thermostat 83 are again established, to open valve 74 and again supply gas to the main burner. Pilot thermostat 82 merely serves to render the control circuit inoperative in the event both the main burner and the pilot valve become extinguished.

In addition to the main operating and control circuit described above, the upper wall of housing 11 may be provided with convenient electrical outlets 86 for making electrical connections to various appliances. As shown in Fig. 8, these outlets can all be connected to a separate current supply circuit 87.

Operation of my apparatus can now be briefly reviewed as follows:—Assuming that the apparatus is in operation, a flame is propagated in the heater tube 18, and products of combustion from this tube are delivered to the flue 22. The blower delivers air to the hot and cold conduits 16 and 17, to be distributed to the various assemblies 10. The operator may selectively control the temperature of air supplied to any one assembly, over a range varying from the temperature of the heated air to the temperature of the surrounding atmosphere, by manipulating handle 63. Units not in operation are closed to discharge of air, by virtue of the automatically operated butterfly valve member 47. By virtue of the automatic thermostat 83, the apparatus automatically accommodates itself to varying capacities, whereby the temperature of the heated air remains substantially the same irrespective of the number of units being employed.

I claim:

1. In hair drying apparatus, separate hot and cold air conduits extending substantially parallel in a horizontal direction, a blower arranged to deliver streams of air to both of said conduits, means for heating air supplied to the hot air conduit, a plurality of laterally spaced air distributor units, a pair of cold and hot air ducts serving to effect communication between each of said distributor units and the cold and hot air conduits, a pair of valve members associated with each pair of said ducts to control flow of air through the same, whereby there is a cold air valve for each cold air duct and a hot air valve for each hot air duct, a single manually operated member for each pair of valve members, and means serving to effect conjoint adjustment of each pair of valve members by movements of its associated operating member, said last means including a lost motion connection enabling adjustment of one valve member independently of adjustment of the other.

2. In hair drying apparatus, separate hot and cold air conduits extending substantially parallel in a horizontal direction, a blower arranged to deliver streams of air to both of said conduits, means for heating air supplied to the hot air conduit, a plurality of laterally spaced air distributor units, a pair of cold and hot air ducts serving to effect communication between each of said distributor units and the cold and hot air conduits, a pair of valve members associated with each pair of said ducts to control flow of air through the same, whereby there is a cold air valve for each cold air duct and a hot air valve for each hot air duct, a single manually operated member for each pair of valve members, and means serving to effect conjoint adjustment of each pair of valve members by movements of its associated operating member, said last means including a lost motion connection enabling closing and opening of the cold air valve while the associated hot air valve remains in full open position.

3. In hair drying apparatus, a device adapted to encompass the head and to deliver drying air, a pipe connected to a source of air under pressure, a hinge serving to connect the structure with said pipe whereby said structure may be swung to an operating position in communication with said pipe or to an out-of-the-way position, and means including a butterfly valve for effecting automatic closing of said pipe responsive to swinging of said device to said out-of-the-way position.

4. In hair drying apparatus, a device adapted to encompass the head and to deliver drying air, a pipe connected to a source of air under pressure, a hinge connected between said device and said pipe whereby said device may be swung to an operating position in communication with said pipe or to an out-of-the-way position, a butterfly valve member pivotally mounted within said pipe for effecting opening and closing of the same, and actuating means serving to effect closing of said valve member when said device is swung to an out-of-the-way position and to effect opening of said valve member when the device is swung to an operating position.

5. In hair drying apparatus, an elongated air heater, a blower, means for delivering air from the blower into contact with the heater and in a direction longitudinally thereof, conduit means for directing the flow of heated air leaving the heater whereby the heated air is caused to flow in opposite directions, one direction being back towards the blower, and a plurality of spaced air distributors having communication with said conduit means.

6. In a hair dryer, an elongated air heater, a blower, means for delivering air from the blower into contact with the heater and in a direction longitudinally thereof, conduit means for dividing the flow of heated air leaving the heater whereby the heated air is caused to flow in opposite directions, one direction being back towards the blower, a single elongated housing enclosing the heater and the conduit means, said housing being formed to afford a cold air conduit arranged to receive cold air from the blower, and a plurality of spaced air distributors connected to the housing, each of said units having provision for establishing communication with both said cold air conduit and said conduit means.

7. In hair drying apparatus, an elongated air conduit, a blower arranged to deliver air into one end of the conduit, an elongated heater disposed within the conduit and extending from the blower end thereof, a secondary conduit disposed within the first conduit and superposed over the heater, the blower end of the secondary conduit being closed and the other end thereof being formed to divert into the same a portion of the hot air leaving the heater, a plurality of

air distributors communicating with said first-named conduit at points beyond the secondary conduit, and a plurality of air distributors communicating at spaced points with the secondary conduit.

8. In hair drying apparatus, an elongated air conduit, a blower arranged to deliver air into one end of the conduit, an elongated heater disposed within the conduit and extending from the blower end thereof, a secondary conduit disposed within the first conduit and superposed over the heater, the blower end of the secondary conduit being closed and the other end being formed to divert into the same a portion of the hot air leaving the heater, a single elongated housing serving to encompass the heater and both said conduits, said housing serving to form a third cold-air conduit having one end thereof communicating with the blower, and a plurality of air distributors connected at spaced points with the housing, certain of said distributors nearest the heater having provision for establishing communication with both said secondary conduit and said cold-air conduit, the remainder of said distributors remote from the heater having provision for establishing communication with said both cold-air conduit and said first-mentioned conduit.

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