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H. B. DAVISON ET AL
AIR CONDITIONING APPARATUS

2,181,801

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2 Sheets-Sheet 1

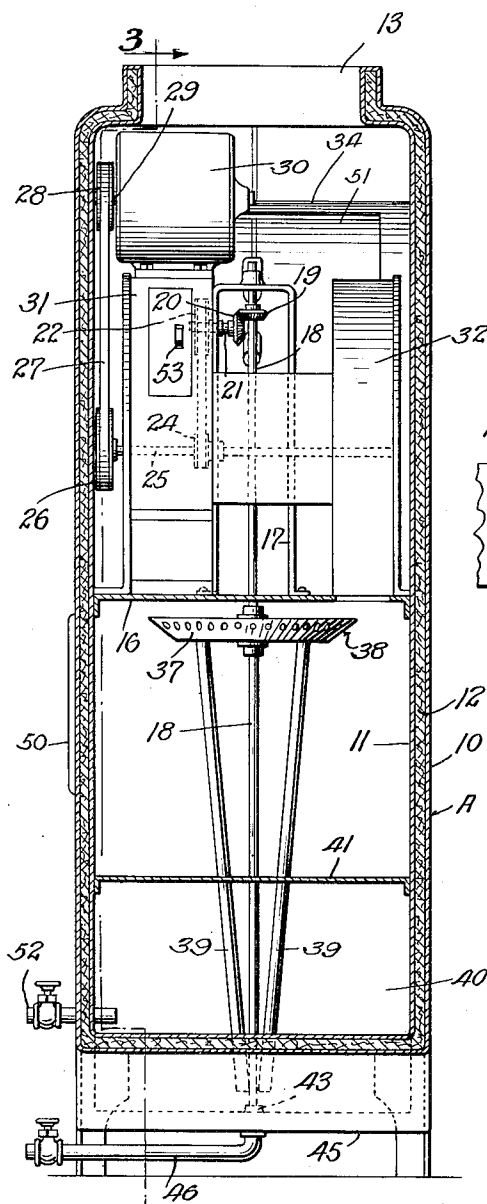


Fig. 1.

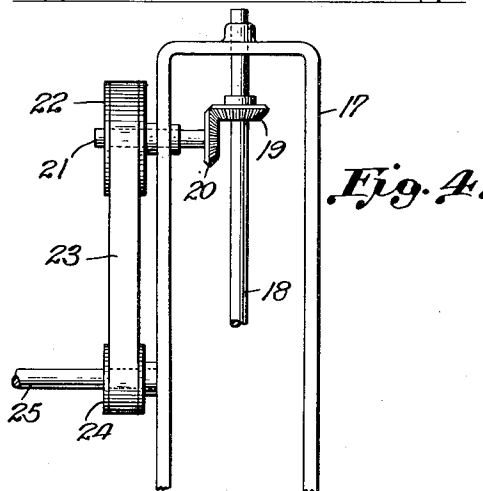
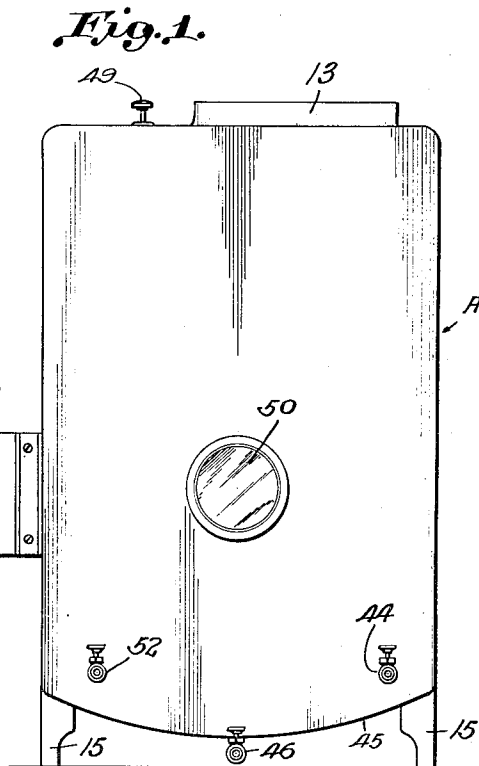


Fig. 3.

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Fig. 3.

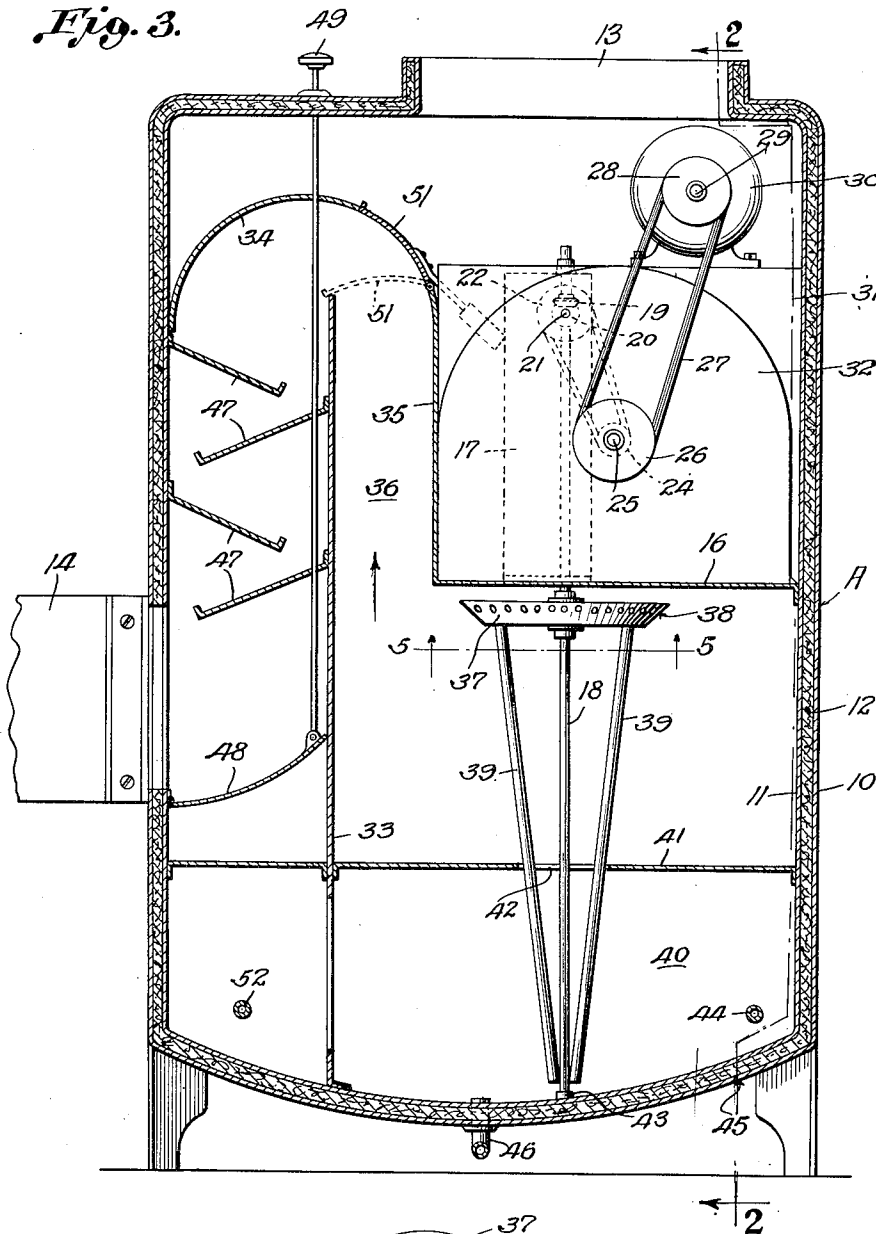
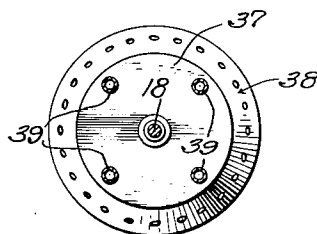


Fig. 5.



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AIR CONDITIONING APPARATUS

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1 Claim. (Cl. 261—91)

The invention relates to an air conditioning apparatus and more especially to that type usually used with heating apparatuses.

The primary object of the invention is the provision of an apparatus of this character, wherein through the use of a centrifugal water wheel on activity thereof water will be thrown into the air for the automatic washing and conditioning of the same, the air being maintained in constant circulation and in the operation of the apparatus such air will be humidified or dehumidified automatically as may be required.

Another object of the invention is the provision of an apparatus of this character, wherein the same is adaptable for any type of heating system and has associated therewith a novel form of centrifugally acting water wheel so that the air under circulation will be washed and cleaned.

A further object of the invention is the provision of an apparatus of this character, wherein a dehydrating chamber is located in advance of an outlet opening and flanged baffle plates being arranged therein for directing the air while manually and automatically operated dampers are arranged respectively at the bottom and top of the said dehydrating chamber for regulating the air flow during the working of the apparatus.

A still further object of the invention is the provision of an apparatus of this character, which is comparatively simple in its construction, thoroughly reliable and effective in operation, assuring moisture in the air and such moisture controlled in a manner that healthful conditions of humidity are maintained, and also inexpensive to manufacture.

With these and other objects in view, the invention consists in the features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings, which disclose the preferred embodiment of the invention and pointed out in the claim hereunto appended.

In the accompanying drawings:

Figure 1 is an elevation of the apparatus constructed in accordance with the invention.

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

Figure 3 is an enlarged vertical sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a fragmentary elevation showing a bearing bracket employed in the machine.

Figure 5 is a sectional view on the line 5—5 of Figure 3 looking in the direction of the arrow.

Similar reference characters indicate corre-

sponding parts throughout the several views in the drawings.

Referring to the drawings in detail, the apparatus comprises a casing A having an outer shell 10 and inner lining 11 and intermediate insulation 12, respectively, the shell 10 and the lining 11 being preferably made from sheet metal. The casing A at its top is provided with a cold air intake 13 while at one side of said casing is a conditioned air outlet 14. This casing A is preferably supported by legs 15 which are located at the bottom corners thereof.

Interiorly of the casing A is an upper shelf-like horizontal support 16 from which rises an inverted substantially U-shaped bearing bracket 17 forming a bearing for a driven shaft 18 fitted with a gear 19 meshing with a companion gear 20 on a stud shaft 21 and having a belt pulley 22 over which is trained an endless belt 23 which is also trained over a belt pulley 24 fixed to a shaft 25. This shaft 25 has fixed thereto the belt pulley 26 having trained thereover an endless belt 27 which is also trained over a belt pulley 28 fixed to the power shaft 29 of an electric motor 30. This motor 30 is suitably supported at 31 to one side of the bracket 17. The shaft 25 in the working thereof operates an air flow device 32 built upon the support 16.

Within the casing A and upstanding from its bottom to one side of the support 16 is a partition 33 while overhanging this partition is an arched crown 34 effecting a continuation of a vertical wall 35 upstanding from the support 16. The support 16 extends from one side to the other of the casing A and likewise the upstanding wall 35 of this support is carried from one side to the other of said casing while constituted between the partition 33 and the wall 35 of the support is an air stream way 36 which extends from beneath the support 16 upwardly over the partition 33 and thence downwardly into the outlet 14. Thus cold air admitted through intake 13 will have flow within the casing through the air flow device 32 downwardly beneath the support 16 and thence through the way 36 to the outlet 14.

The shaft 18 carries a centrifugal water distributor which includes a hollow disk-like head 37 peripherally beveled at 38 and from this head extend downwardly convergent water lift tubes 39, these being submerged in water contained in a water chamber 40 closed at its top by a cover plate 41. The cover plate 41 has a suitable opening 42 forming a clearance for the tubes 39. The chamber 40 is located at the extreme lower portion of the casing A. The shaft 18 carrying the

water distributor or lifter is journaled at its lowermost ends in a suitable bearing 43 at the bottom of the said casing A. Leading into the chamber 40 is a valved water inlet pipe 44, the bottom 5 45 of the casing being preferably dished and opening through the lowermost portion of this bottom is a valved drain pipe 46. The water to be lifted by the tubes 39 of the water distributor or lifter is let into the chamber 40 through the 10 inlet pipe 44 and through centrifugal action of the water distributor the water lifted by the tubes 39 will be sprayed for the washing of air circulating through the casing following the flow way 36 to the outlet 14.

The flow way 36 in that portion close to the outlet 14 has arranged therein staggered reversely disposed baffles 47 which function in the usual manner. At the outlet 14, that is, the lowermost point thereof, is fixed a controlled 20 damper 48, being freely flexible for the dishing thereof and this damper has engagement with the partition 33, being operated from a manual control device 49 accessible from without the casing A at the top thereof. The flexing of the 25 damper 48 for the dishing thereof in a direction below the plane of the lowermost point of the outlet 44 enables the trapping of moisture to avoid excess moisture from entering the furnace through the outlet 14. At one side of the casing A and conveniently located in an inspection window 50 so that a view may be had interiorly of said casing.

The crown 34 is equipped with an automatically active safety draft damper 51. In the working 35 of this automatically controlled damper, in the event that the belt 23 should break or electric current is shut off to the motor, the said damper will automatically open because the instant the blower stops, the weight of said 40 damper is sufficiently heavy to drop and in this movement air can freely pass from the inlet 13 to the outlet 14. This damper 51 is positioned and balanced with relation to the crown 34 so that on shutting off of the fan it drops from the 45 full line position shown in Figure 3 of the drawings to the dotted line position therein and in this way the air stream is automatically shut off to the water and air from the inlet passes directly to the outlet. This is to prevent possible damage 50 to the furnace when the apparatus is passive.

Leading from the chamber 40 is a valved overflow pipe 52 so that water within this chamber can be maintained at a determined level therein.

In the operation of the apparatus the cold air 55 enters the intake 13 thence by action of the flow device 32 the said air will be caused to flow down-

wardly beneath the support 16 and the distributor operating causing the lifting of water through the tubes 39 from the chamber 40 and by centrifugal force the water will be sprayed 5 through the head 38 of said distributor for the washing of the air whence the washed air flows through the way 36 into and passes out from the outlet 14. Thus it will be seen that the air will be thoroughly washed and conditioned when flowing to the outlet 14. 10

The water is admitted to the chamber 40 through the water intake pipe 44 and a determined level of water is had therein, any overflow being let out through pipe 52 and when it becomes 15 necessary to drain the water from this chamber 40 the drain pipe 46 is opened.

The casing A exteriorly thereof at a convenient location carries a lever switch 53 for controlling the electric current to the motor 30 for starting and stopping of the latter. 20

The space within the casing A above the water chamber 40 and beneath the support 16 serves as a dehydrating compartment interiorly of said casing. 25

What is claimed is:

Apparatus of the kind described comprising a casing having an air inlet, an air outlet, and a water chamber in its lower portion, a valve-like support above the water chamber and extending 30 partially across the said casing, a vertical shaft extending through the support above and below the same, an air flow device on said support and directing air flow downwardly beneath the latter, a vertical partition interiorly of the casing and rising a distance therein from the water 35 chamber between and spaced from one side of the casing and the support, a vertical wall upstanding from said support next to said partition, an upwardly arched crown forming a continuation of said wall and meeting the side of the casing next 40 to said partition for overhanging the latter, a weighted damper positioned and balanced in the arched crown next to the upstanding wall for engaging the partition at its uppermost end for the opening of the crown and establishing direct 45 communication between the inlet and outlet, and a self-filling water distributor below the support, operated by said shaft and partially submerged in water within the said chamber, the air inlet being above the air flow device and arched crown, 50 the outlet being in communication with the casing through the side thereof next to the partition and beneath the arched crown.

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