Nov. 16, 1926. 1,607,065

E. R. ELLIOTT

AIR COOLING APPARATUS

Filed July 2, 1926 2 Sheets-Sheet 1

FIG. 1

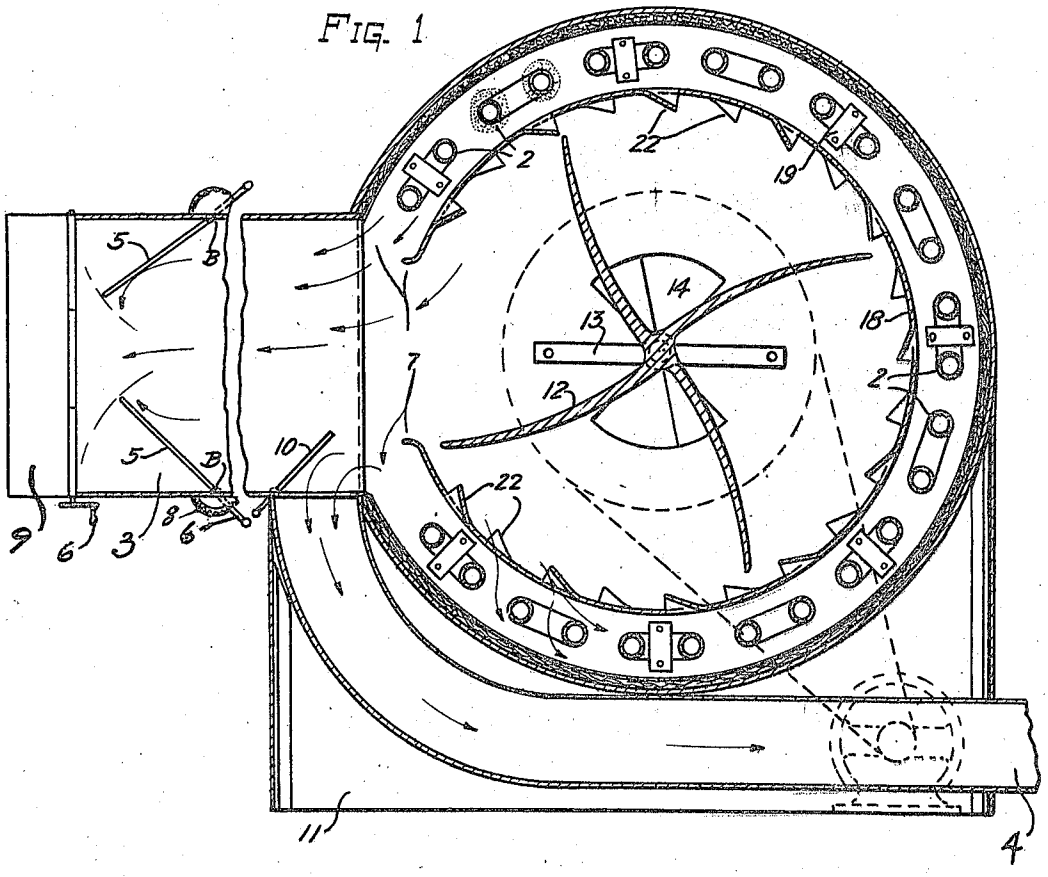


FIG. 4

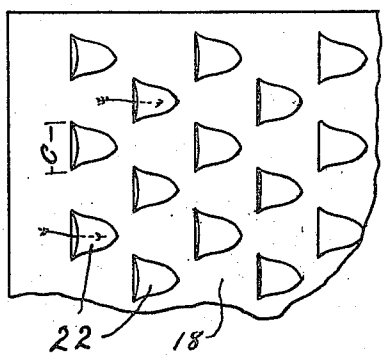


FIG. 6

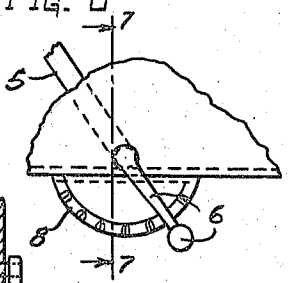


FIG. 7

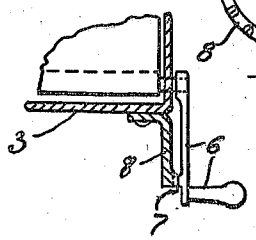


FIG. 5



INVENTOR.

EVERETT R. ELLIOTT

BY

U. G. Charles

ATTORNEY.

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E. R. ELLIOTT

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FIG. 2

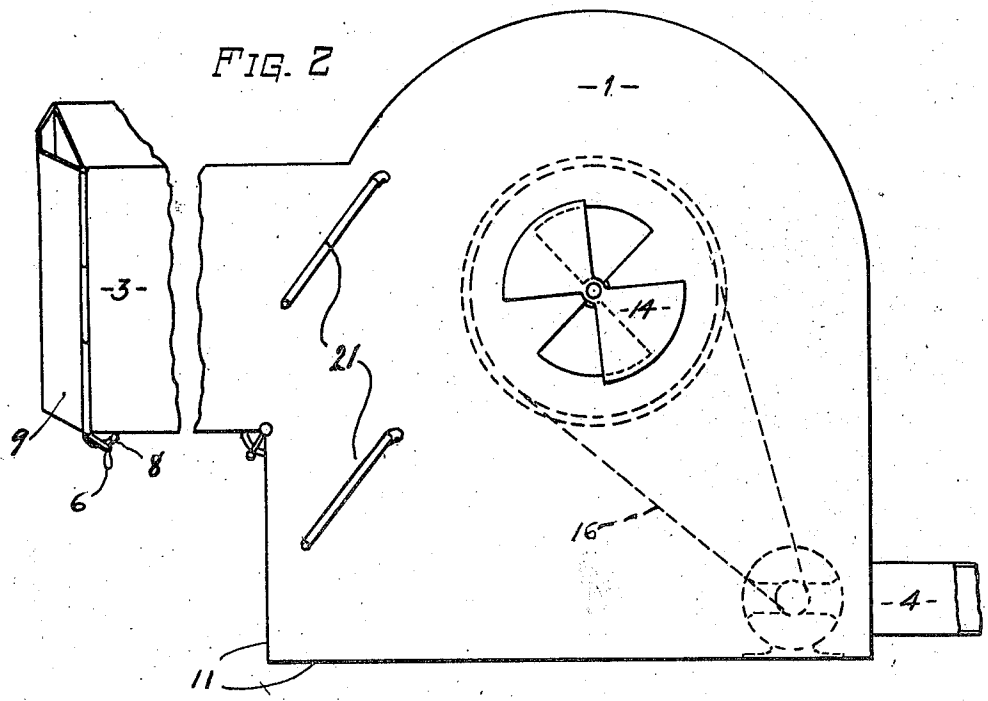
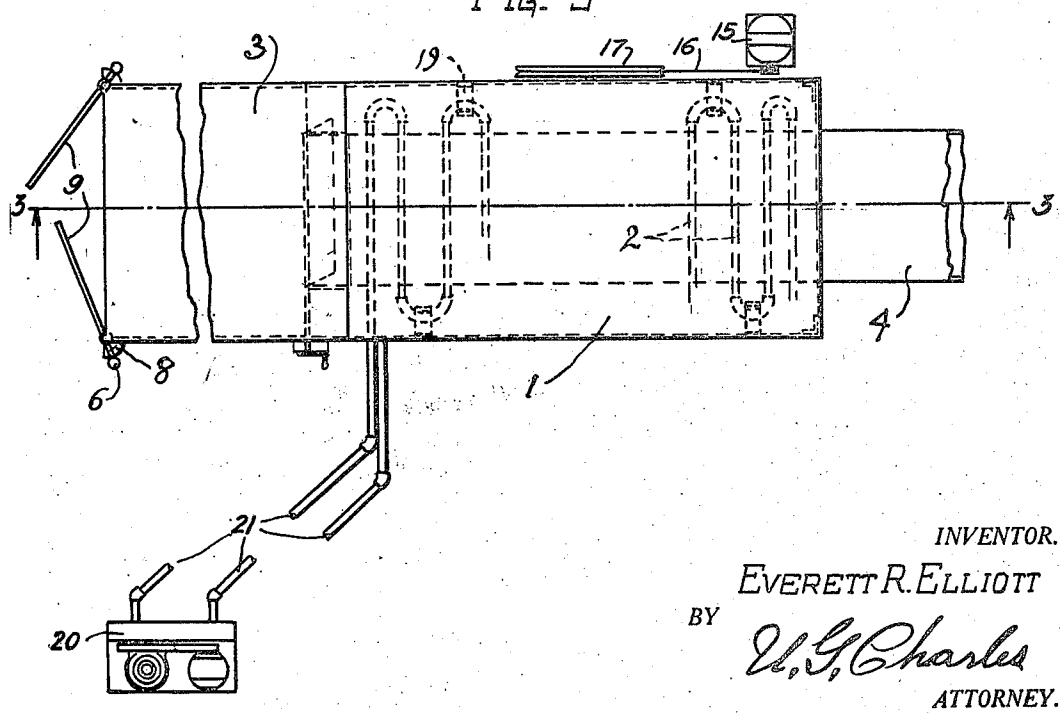


FIG. 3



INVENTOR.

EVERETT R. ELLIOTT

BY E. G. Charles

ATTORNEY.

Patented Nov. 16, 1926. 1,607,065

UNITED STATES PATENT OFFICE.

EVERETT R. ELLIOTT, OF TOPEKA, KANSAS.

AIR-COOLING APPARATUS.

Application filed July 2, 1926. Serial No. 120,132.

My invention relates to a cooling system mechanically operated.

The object of my invention is to provide a simple and efficient means for the circulation of air through refrigerating coils and discharging it through ducts.

A further object of my invention is to provide a means separating the fan from the ice covered coils in such a way that the accumulation of water will not be forced through the ducts.

A still further object of my invention is to provide a fan chamber having a means for modifying the thrust of the current upon the cooling coils when greater force is required to eject the air through the ducts, by which arrangement excess pressure upon the coils would tend to melt the ice therefrom.

A still further object of my invention is to provide baffle plates to control the direction of the current as it leaves the ducts.

A still further object of my invention is to provide a fan chamber having a duct connected therewith to which tributaries may be attached and each thereof having a separate controlling means.

A still further object of my invention is to provide a cooling apparatus applicable to public and private use, and may be thermostatically controlled, the said cooling apparatus having in co-operation therewith an electric motor, refrigeration plant and a thermostatic controlling means for the air circulating means.

Referring to the drawings:

Fig. 1 is a vertical cross section through the fan chamber and ducts taken along line 3—3 in Fig. 3 looking in the direction of the arrows.

Fig. 2 is a side elevation of the fan chamber and a fragmentary view of the air ducts.

Fig. 3 is a plan view of the co-operating elements.

Fig. 4 is a fragmentary plan view of the fan chamber lining.

Fig. 5 is an edge view of Fig. 4.

Fig. 6 is a detailed side view of the baffle plate detent sector controlling means.

Fig. 7 is a sectional view through Fig. 6 taken on line 7—7 looking in the direction of the arrows.

The mechanism herein disclosed consists of a fan chamber 1; the said chamber being insulated about the peripheral exterior by doubling the walls and placing a fibrous insulation therebetween as protection for the coils 2.

Leading from the chamber are ducts 3 and 4, the duct 4 connecting with duct 3 in close proximity to the exit of the chamber as at A. The duct 3 has a pair of baffle plates 5 horizontally pivoted as at B, the selected angle of the plates being controlled by a crank 6 having a protrusion as at 7 to engage with a notched sector 8, by which means a selected angle of the plates may be retained. On the end of the said duct are two vertically positioned baffle plates 9 adapted to swing outward for varying the flow of the current to the right or left as desired. The said baffle plates having a similar detent means for retaining the angle as above described. The duct 4 has a similar plate controlling means not shown in the drawings where the duct 4 connects to the under side of duct 3 is a baffle plate 10 functioning as a valve by which means the duct 4 may be closed, or open to receive a desired force of current. The said ducts may be constructed of sheet metal, wood or composition, also the walls of the fan chamber. The fan chamber is preferably mounted on a base 11 as means for spacing said chamber from the floor so that a duct may be extended rearward running between the chamber and the floor as shown in Fig. 1.

Rotatably positioned within said chamber is a fan 12 having curved wings as shown in Fig. 1, the said fan being trunnioned on bars 13 which are rigidly attached to their respective ends of the chamber. Concentrically positioned to the journal of the fan and each side of the chamber are valves 14 rotatably mounted, said valves adapted to close the air inlet for the fan or open to any portion desired, by which means the current ejected through the ducts by the fan may be controlled. The current may also be controlled by thermostatic means acting on the motor 15 functioning as motive power for the fan. The motor being diagrammatically shown in Fig. 3 transmits power through the medium of a belt 16 to a sheave 17 which is rigidly attached to the fan journal.

Intermediately positioned between the peripheral walls of the fan chamber and a lining 18 are a series of coils 2 extending from one side to the other as shown in Fig. 3. The return bends of the coil being rig-

idly attached to the sides of the chamber by hangers 19; the said coils functioning as distribution means for refrigeration about the periphery of the inside walls of the chamber as hereinafter described.

Positioned at a convenient location is a refrigerating machine 20 as shown diagrammatically in connection with Fig. 3 and extending therefrom are circulating pipes 21 by which means the said machine circulates the fluid through the coils. It being understood that the machine has the capacity of compressing and condensing such fluids as are commonly used for refrigerating purposes. By this system an accumulation of ice will form on the coils and having ample space around the ice covered pipes, the air is free to circulate through what I will now term as a cooling chamber. The pipes thus covered by the ice have a greater surface exposure than would be by a continuous uninterrupted surface peripherally positioned. As a modifying means for the current from the fan I have provided an annular lining separating the fan from the coils and in said lining I have provided a series of apertures or deflectors 22 placed in rows across the lining. The said deflectors being staggered and in close proximity similar to that shown in Fig. 4, the said deflector being formed by cutting the metal to a length as shown at C then by pressing outward at one side of the cut as shown in Figs. 1, 4, and 5, an opening is made through which air will flow as shown by arrows in said figures.

It is now readily seen how the air blast from the fan is modified and distributed about the coils and discharged therefrom as indicated by the arrows entering the ducts in Fig. 1.

Such other modifications may be employed as lie within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In an air cooling apparatus of the kind described, a cylindrical fan chamber having an annular cooling chamber, a plurality of openings through the inner wall of said chamber, said openings confronting to receive the current from the fan as air circulating means through said annular chamber, an exit for the fan chamber and the annular chamber for external discharge, a fan concentrically mounted to said annular cooling chamber, an adjustable intake valve for the fan, a duct connecting to the fan chamber, and a duct connecting to the first said duct in close proximity to the exit of the fan chamber, a valve for last said duct, said valve having a sector positioning means for the adjustment thereof, all substantially as shown and described.

2. In an air cooling apparatus, a fan chamber comprising a cooling compartment, a plurality of pipes connected by return bends for a continuous flow of refrigerating fluid, a fan and an apertured lining separating the fan from the coils as a retarding and distributing element for the current about said coils, an adjustable air intake for the fan, an air exit through the apertured lining, and an exit for the air circulating around said pipes simultaneously through a duct.

EVERETT R. ELLIOTT.