March 1, 1938. W. C. NELSON 2,109,926

AIR COOLING DEVICE

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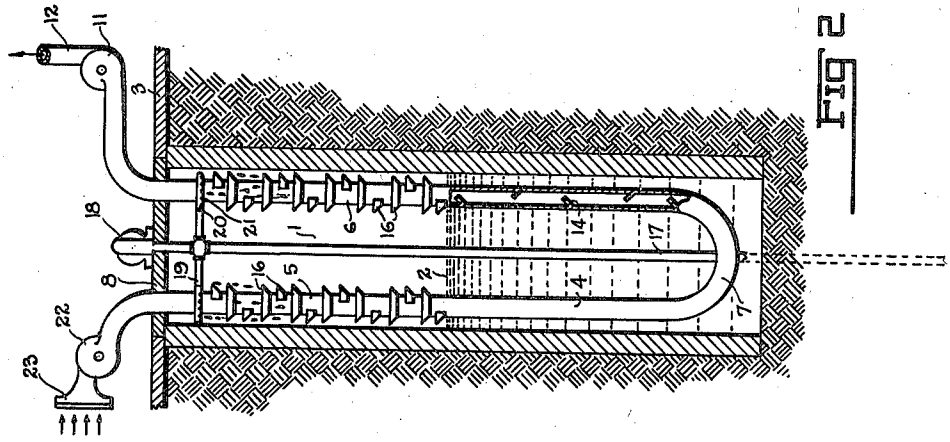


FIG 2

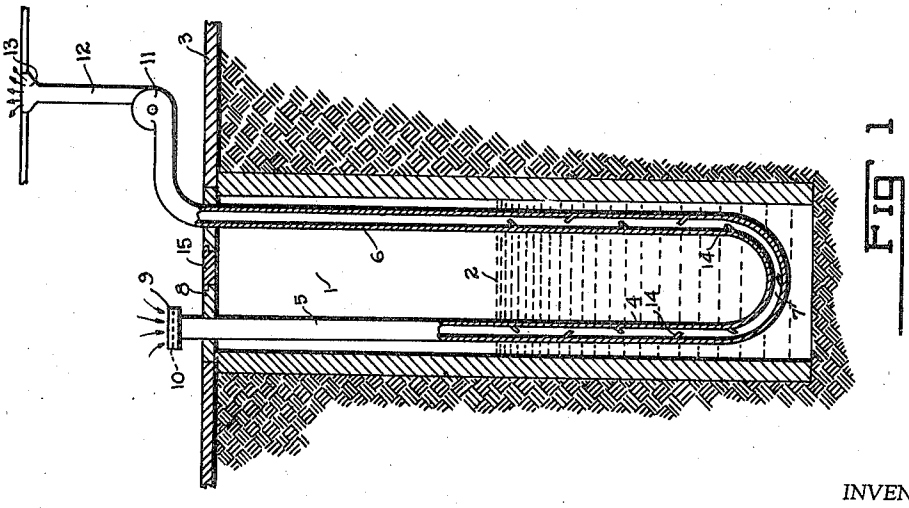


FIG 1

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AIR COOLING DEVICE

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4 Claims. (Cl. 257—121)

This invention relates in general to air cooling devices and particularly to that type of device in which air is passed through a conduit cooled by contact with the cool air or liquid in a well, to lower the temperature of the air which passes through the conduit and discharges into the ducts of the heating furnace or into an independent system of air ducts.

The object of the invention is to provide an air cooling device of the class described, relatively simple in construction and inexpensive to operate.

A further object of the invention is to provide deflectors in the air conduit to retard the air and cause a turbulence, whereby the air is retained in the conduit a longer period of time and is more effectively cooled.

A still further object is to provide outside troughs or liquid retainers on the portion of the air conduit which is not submerged, and a pump to provide cool liquid from the well to fill the troughs or retainers, whereby the upper portion of the air conduit may be cooled to lower the temperature of the air passing therethrough.

Further objects and advantages will be apparent upon reference to the following description in connection with the accompanying drawing in which:

Fig. 1 is a vertical, semi-diagrammatic, cross sectional view through one form of my invention.

Fig. 2 is a similar view through a modified form of the same.

Referring now to the drawing by numerals of reference 1 designates a well containing liquid 2. The well is preferably positioned in the basement of the building in which the cooling system is installed, the basement floor being indicated at 3. A conduit 4 having intake and exhaust legs 5 and 6 is positioned vertically in the well 1, and has a U-shaped portion 7 at the lower end thereof, contacting the liquid 2.

The upper ends of the legs 5 and 6 pass through a well cover 8 which is sealed around the peripheral edge thereof as well as at the joints where the conduit contacts the well cover, thus sealing the interior of the well from the atmosphere. The intake leg 5 of the conduit 4 has an intake head 9 in which may be placed an air filter 10, indicated by dotted lines and removable when desired. The exhaust leg 6 of the conduit 4 passes into a blower or fan 11 which draws the air out of the conduit and passes it into the duct 12, the end 13 of which may open into the room to be cooled. One or more ducts 12 may be employed with openings in a number of rooms or a number of openings may be used in one room. Where the building is equipped with ducts to carry warm air from the furnace, the duct 12 may open into the main duct from the furnace and be distributed through the warm air system.

To more effectively cool the air which passes through the conduit 4, I have provided in the lower portion thereof a plurality of deflectors 14, preferably staggered as shown, the deflectors causing a turbulence in the flow of air to retard it slightly thereby retaining it in contact with the sides of the conduit and more effectively lowering the temperature of the air.

While shown only in the lower portion of the conduit, it is obvious that the deflectors 14 may be employed the full length of said conduit if desired. An air tight manhole cover 15 may be provided in the well cover 8.

To provide additional cooling action I have provided a modified form of cooling device as shown in Fig. 2. This modification includes all the structure shown in Fig. 1 and in addition has a plurality of troughs or liquid retainers 16 positioned about the exterior of the upper portion of the conduit 4, which is ordinarily not submerged in the liquid. A pipe 17 extends down into the liquid and a pump 18 raises the liquid into the transverse pipes 19 to distributing members 20 having openings 21 from which the liquid gravitates to the troughs or retainers 16 and along the outside surface of the conduit 4 to keep same at a lower temperature and consequently cooling the air passing through said portion of the conduit.

An intake fan 22 may be applied at the upper end of leg 5 at the intake head 23, said fan assisting in supplying air to the cooler and forcing the air through the conduit.

While the foregoing description has been limited to two forms of cooling devices it is clearly apparent that the structures shown may be further modified without departing from the spirit of my invention. For instance, the intake fan 22 may be used in the structure shown in Fig. 1.

In the event of a dry well the device may still be used to cool air by extending the pipe 17 deeper into the ground until liquid is reached, the liquid being pumped to the upper portions of conduit 4 and then passing down the outside surface thereof sufficiently cooling same to cool the air passing therethrough. In the latter modification the troughs or retainers 16 may be provided at regular intervals along the entire length of the conduit.

I do not wish to be limited to the exact construction shown and described since obviously various changes can be made in form and proportion and minor details of construction without departing from the spirit of my invention.

What I claim as new and desire to secure by Letters-Patent is:

1. In combination with a well, an air cooling device comprising a conduit depending into the well, said conduit having an intake and an exhaust above the top of the well, troughs or retainers on the exterior of said conduit and means for supplying liquid to said troughs or retainers to cool the conduit and the air passing therethrough, and a blower or fan at said exhaust to draw the cooled air through the conduit and discharge the same therefrom.

2. In combination with a well containing a liquid, an air cooling device comprising a conduit depending into the well, the lower portion of said conduit being immersed in the liquid, said conduit having an intake and an exhaust above the top of the well, a blower or fan at said exhaust to draw the cooled air through the conduit and discharge same therefrom, troughs or retainers on the exterior of the upper portion of said conduit and means for supplying liquid to said troughs or retainers to cool the conduit and the air passing therethrough.

3. The structure as specified in claim 2, including deflector members in said conduit to cause a turbulence in the air stream.

4. In combination with a well, an air cooling device comprising a conduit depending into the well, said conduit having an intake and an exhaust above the top of the well, troughs or retainers on the exterior of said conduit, means for supplying liquid to said troughs or retainers to cool the conduit and the air passing therethrough, and one or more blowers or fans adapted to move the air through the conduit and discharge the same therefrom.

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