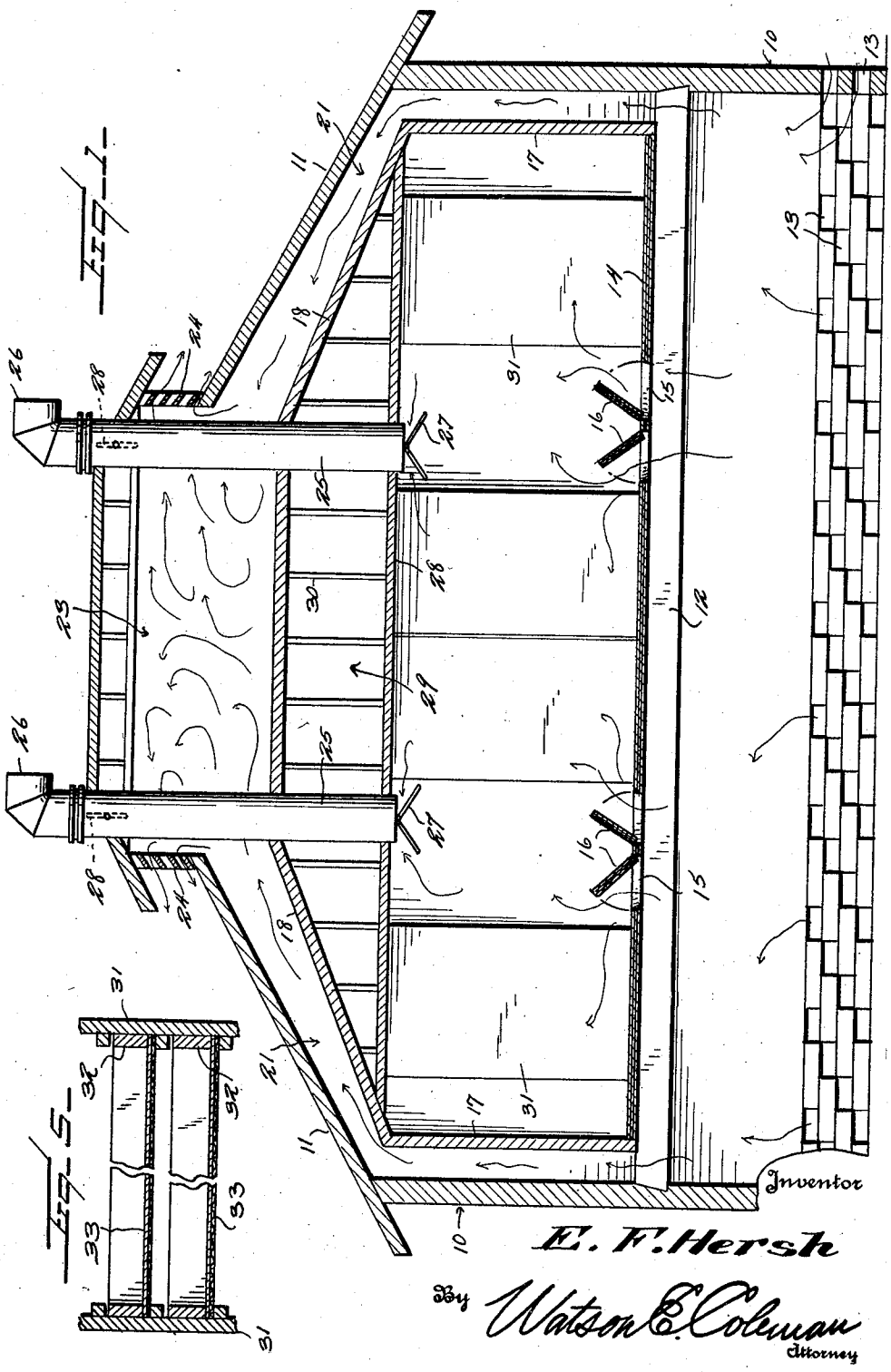
March 4, 1930. E. F. HERSH 1,749,343

COOLING OR REFRIGERATING STRUCTURE

Filed Nov. 6, 1928 2 Sheets-Sheet 1



March 4, 1930. E. F. HERSH 1,749,343

COOLING OR REFRIGERATING STRUCTURE

Filed Nov. 6, 1928 2 Sheets-Sheet 2

Fig. 2.

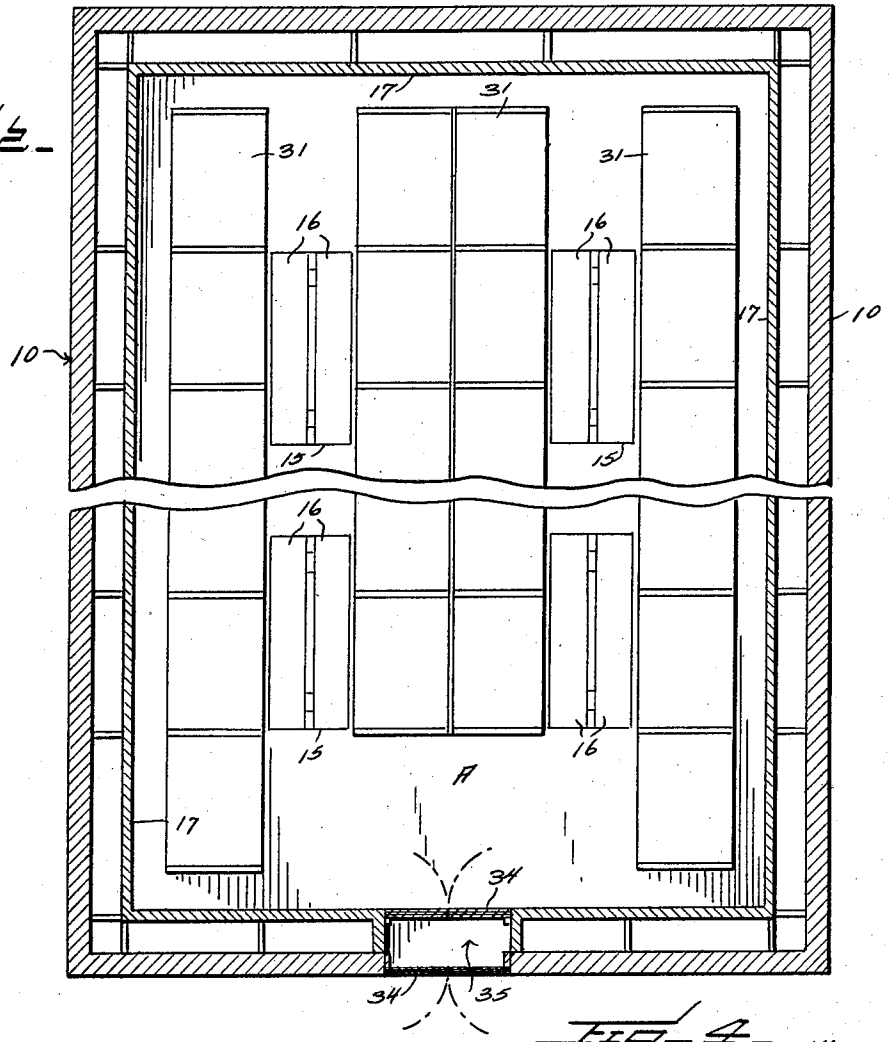


Fig. 3.

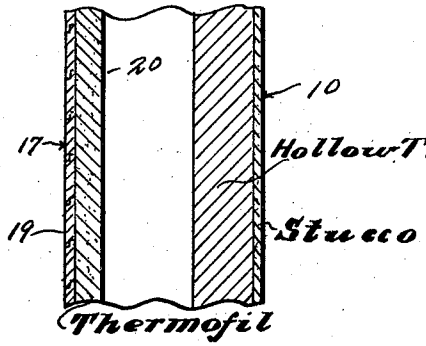
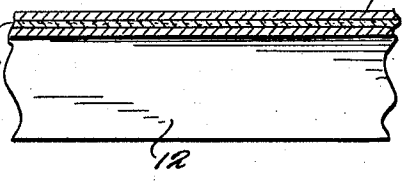


Fig. 4.



Inventor

E. F. Hersh

By Watson E. Coleman

Attorney

Patented Mar. 4, 1930 1,749,343

UNITED STATES PATENT OFFICE

EARL F. HERSH, OF McALLEN, TEXAS

COOLING OR REFRIGERATING STRUCTURE

Application filed November 6, 1928. Serial No. 317,662.

This invention relates to the art of keeping perishable objects cool and particularly buildings wherein such objects may be stored and kept for an indefinite period. The general object of the invention is to provide a building of this character so constructed that the interior will be kept cool and at a relatively low temperature without the use of ice or other refrigerating appliances such as cooling coils and the like.

A further object of the invention is to so construct a building of the character stated that it will be kept at all times at a temperature approximately that of the temperature at night, the night temperature being cooler than the day temperature by approximately an average of seventeen or eighteen degrees, this being particularly true of certain portions of Texas.

A further object is to provide a building structure formed with an outer wall and an inner wall with an air space between the inner and outer wall, with an air space in the roof of the building and below the floor thereof, and provide means whereby ventilators in the floor may be opened during the night to allow the entrance of cool air and provide air discharge flues having dampers whereby the flues may be opened during the night to permit the cold air entering the room to force the warmer air out through said flues.

The flues and ventilators are closed in the morning so as to entrap the cold air and preserve it within the room or building insulated from the atmosphere surrounding the building.

Detailed objects will appear more fully hereinafter.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a vertical transverse sectional view through a cooling building constructed in accordance with my invention;

Figure 2 is a top plan view thereof with the walls in section;

Figure 3 is a vertical section through the outer and inner walls;

Figure 4 is a vertical section through the floor;

Figure 5 is a detailed sectional view through two of the trays.

Referring to these drawings, it will be seen that I have illustrated diagrammatically a building particularly adapted for the storage of fruits, vegetables and the like though it may be used for many other different purposes. The wall of the building preferably consists of hollow tile designated generally 10 extending upward from a suitable foundation to any desired height and upon this is disposed the roof 11 which is shown as upwardly inclined.

The floor of the building is supported upon suitable joists 12 and preferably the hollow tile of the walls 10 would extend down to the ground and be formed as a checker-work so as to provide the air openings 13 opening into the space beneath the floor. The floor 14 is formed of an upper and a lower layer of boards or like material and an intermediate layer of some temperature insulating material such for instance as celotex. This floor is so laid as to be practically impervious to the passage of air and is provided at any desired intervals with relatively large ventilating doors or valves 16. These doors or valves are shown as formed of two hinged sections adapted to be opened upward to permit the inlet of air through the openings 15 or to be lowered or closed. The wall 10 is preferably covered with stucco and inward of the wall 10 there is an inner wall 17. Preferably this outer wall will be of eight-inch hollow tile and there will be an air space of twelve inches between the outer wall and the wall 17 of the inner room or compartment enclosing the wall 17.

Extending upward and inward from this inner wall is an inner roof designated 18. The wall 17 and the inner roof 18 will be formed of shiplap and thermofil as shown in Figure 3 wherein the shiplap is designated 19 and the thermofil 20. Between the inner roof 18 and the outer roof 11 there is an air space 21 which communicates with the air space between the outer wall and the inner wall. This air space opens into a compartment or chamber 23 having louvres 24 in or forming the walls of the compartment. Thus, it will

be seen that air entering through the checkerwork 13 will circulate beneath the floor and pass upward through the space between the walls and between the outer and inner roofs and thence pass out through the louvres 24.

Extending down through the roof of the chamber 23 and downward through the false roof or inner roof 18 are ventilation pipes 25 each carrying at its upper end a ventilating hood 26. These hoods may be rotatably mounted upon the chimneys 25 in the manner of chimney cowls so as to turn with the wind or they may be fixed. I do not wish to be limited to the particular form of these hoods provided the construction is such as to secure a good upward draft through the ventilating pipes 25. Preferably each of the ventilating pipes 25 will be provided at its lower end with a damper 27 shown as a double swinging damper though any other damper may be used and preferably the upper ends of the pipes 25 may also be provided with dampers 28 so that when these dampers are closed, upward movement of any air through these ventilating flues or pipes 25 will be absolutely prevented, the construction being such that when the dampers are opened, a strong upward passage of air will be secured.

Preferably the compartment or inner room A will have a ceiling 28 disposed below the inner roof. This ceiling will provide a dead air space 29 between the inner roof and the ceiling which may be divided into a series of cells by means of a partition 30 if desired. This ceiling, therefore, forms a non-conductive structure or dead air space between the room A and the space between the inner roof 18 and the roof 11.

While as before stated, I do not wish to be limited to any particular use for this cooling structure, I have heretofore erected a structure of this character for the purpose of keeping fruit, such for instance as citrus fruits. I have found that citrus fruits harvested in February may be kept until June without ice within a building constructed in accordance with my invention.

While obviously various forms of racks may be used for preserving fruit, preferably I provide racks 31 which extend from the floor to the ceiling of the building, these racks being designed to receive sliding trays 32, each tray being formed with a burlap bottom 33 supported by open mesh metallic fabric, thus permitting the free circulation of the cold air through the racks above the trays and upward through the trays.

In Figure 2, I have illustrated a floor plan or structure constructed in accordance with my invention wherein the ventilators are disposed in the aisles between the racks and wherein there is a single entranceway 35 provided with the outer doors and the inner doors 34 but obviously I do not wish to be limited to any such plan and have merely shown it as an illustration of my invention.

As before remarked, in the use of an invention of this character, the ventilators are open at night and at night the cool night air enters through the doors, passes upward through the ventilators and fills the room, forcing the warm air out through the discharge pipes. Early in the morning, these ventilators 16 are closed and the ventilators in the discharge pipes are closed and the air is then retained in the room at a relatively much lower temperature than the air exterior to the building. This air is retained at this temperature by reason of the fact that there is an insulating space formed by the current of air passing upward between the outer wall of the building and the inner wall and passing out through the louvres and furthermore by the fact that the outer wall is formed of tile and the inner wall 17 is formed of shiplap with some nonheat-conducting substance such as thermofil associated therewith.

The dead air space above the ceiling of the room A, of course also acts to insulate the room.

Of course, it will be understood that the louvres remain open at all times and the air circulates through the openings in the lower part of the tile wall up through the space between the walls, around between the two roofs and then out through the open louvre vents.

I claim:—

1. A cooling structure having an insulating floor, an outer wall, an outer roof, an inner wall extending upward from the floor and spaced from the outer wall, an inner roof associated with the inner wall to thus provide an air circulating space between the outer and inner walls and the outer and inner roofs, a chamber into which said space opens having louvres, ventilators disposed in the floor and ventilating pipes extending up from the inner roof and extending exteriorly to the outer roof and having a damper.

2. A cooling structure of the character described, comprising an outer wall, an inner wall, an insulating floor for the space defined by the inner wall, the outer wall below the said floor having air inlet openings, an inner roof associated with the inner wall, an outer roof associated with the outer wall, the air space between said roofs opening into the air space between said walls, a chamber into which said air space opens having a louvre, ventilating valves in the floor adapted to be opened at night to permit the entrance of cold air, a vertical ventilator pipe opening from below the inner roof and extending to the outside air and a damper in the ventilating pipe whereby the passage through the pipe may be permitted or cut off.

3. A cooling structure of the character described, comprising outer walls of hollow tile, a floor operatively supported upon said walls,

the outer wall below the floor having inlet openings for the inlet of fresh air, an inner wall spaced from the outer wall and formed of insulating material, an outer roof associated with the outer wall, an inner roof associated with the inner wall, the space between said walls and said roofs constituting an air circulating space and opening with the space beneath the floor, a chamber into which the upper end of said space opens and having louvres, and a ventilating flue opening into the room defined by the inner wall and extending upward and above the outer roof, a plurality of dampers disposed in said ventilating flue and a plurality of valves forming part of the floor and when open permitting the entrance of air into the room from beneath the floor.

4. A cooling structure of the character described, comprising an outer wall, a floor carried thereby, an inner wall defining a room, the floor and inner wall being composed of non-heat-conducting materials, an outer roof associated with the outer wall, an inner roof associated with the inner wall, the space between the outer and inner walls and the outer and inner roofs forming an air circulating space, said space opening beneath the floor, a chamber into which the upper end of said space opens and having louvres, a ceiling for said room and spaced from the inner roof to provide a dead air space and a ventilating flue leading from the room up through the dead air space and through the outer roof, and means for controlling the passage of air therethrough.

5. A cooling structure of the character described including an inner chamber having a wall, floor and roof, an outer wall and roof enclosing the inner chamber, and defining an air space surrounding the inner chamber above, below and around the same, the outer walls above the inner chamber having ventilating openings, the floor of the inner chamber having valved openings into said air space, and valved ventilators leading from the upper portion of the inner chamber through the outer roof.

In testimony whereof I hereunto affix my signature.

EARL F. HERSH.