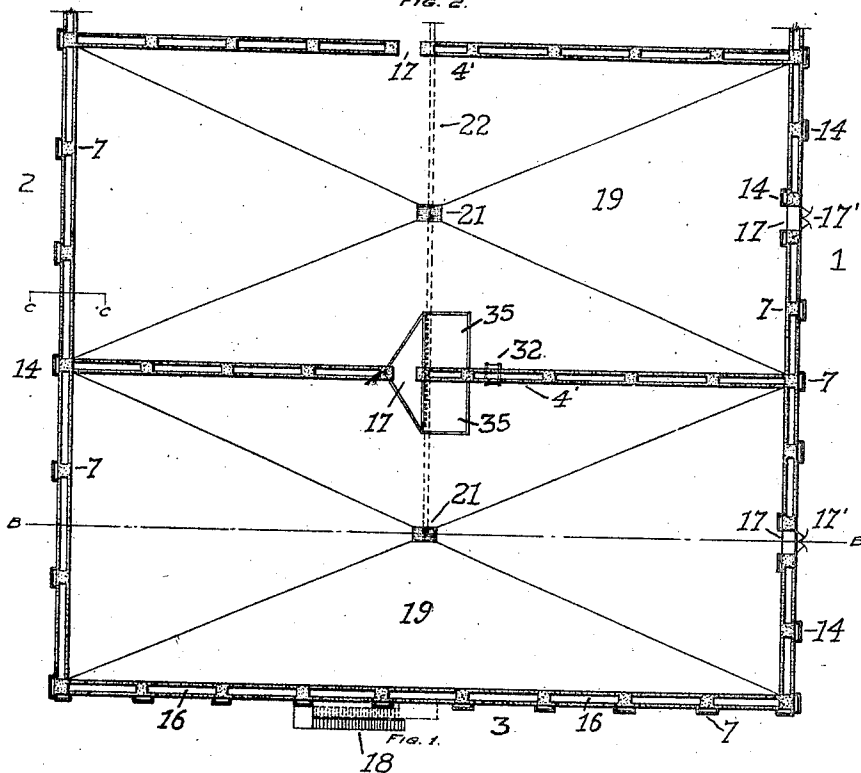
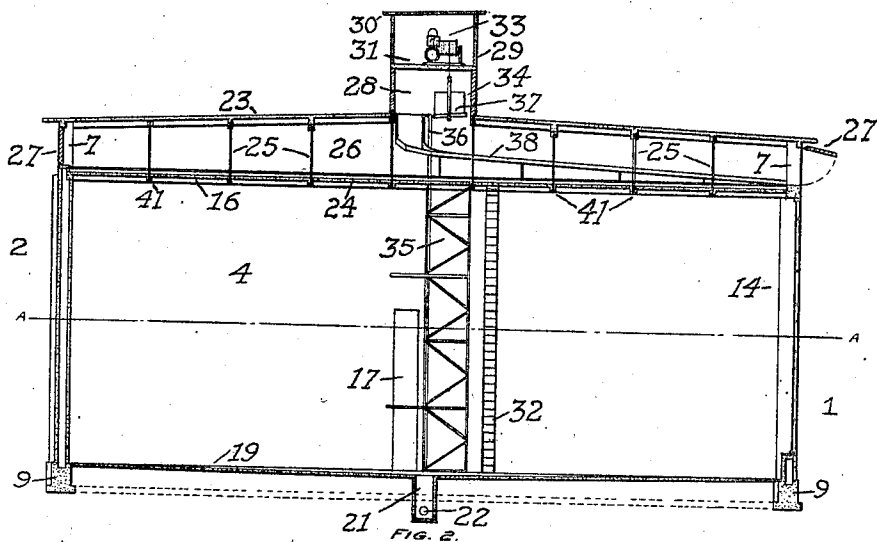


1,106,854.

C. A. P. TURNER.  
ICE HOUSE.  
APPLICATION FILED JULY 21, 1913.

Patented Aug. 11, 1914  
2 SHEETS-SHEET 1.



WITNESSES:

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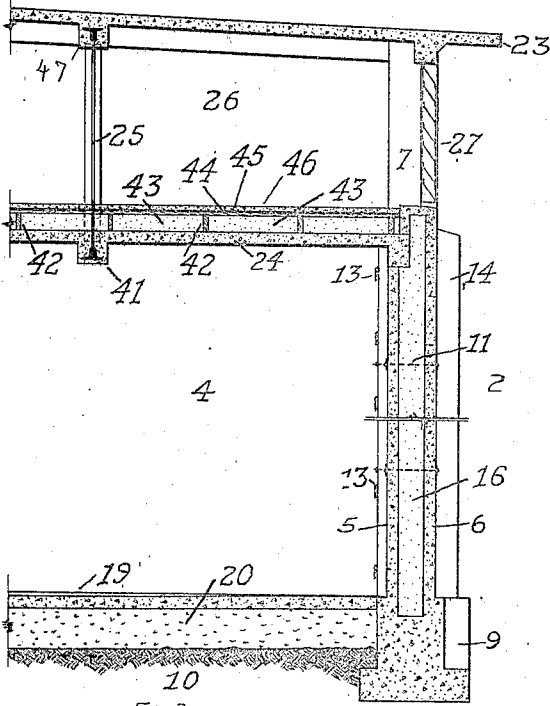


FIG. 3.

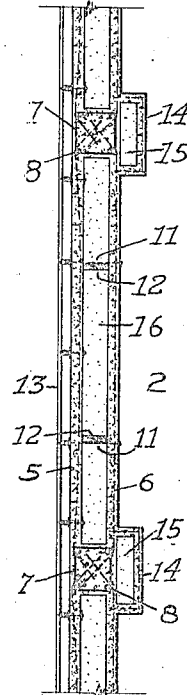


FIG. 4.

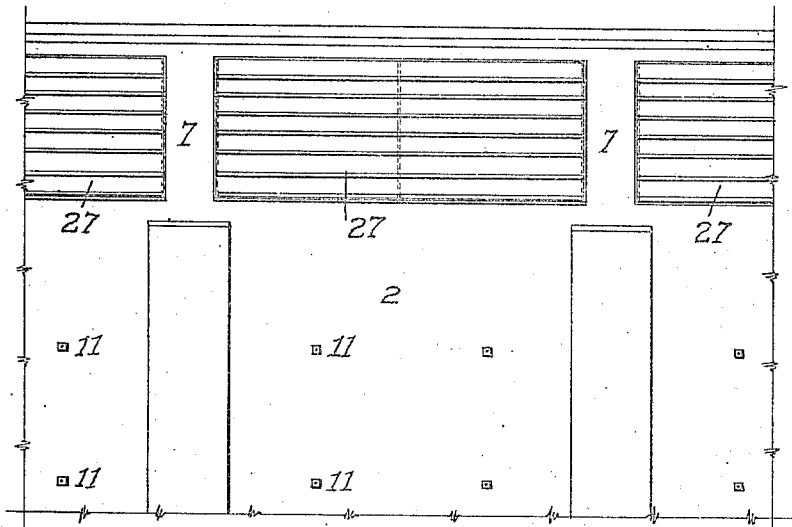


FIG. 5.

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# UNITED STATES PATENT OFFICE.

CLAUDE A. P. TURNER, OF MINNEAPOLIS, MINNESOTA.

## ICE-HOUSE.

1,106,854.

Specification of Letters Patent.

Patented Aug. 11, 1914.

Application filed July 21, 1913. Serial No. 780,100.

*To all whom it may concern:*

Be it known that I, CLAUDE A. P. TURNER, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Ice-Houses, and have described the same in the following specification, illustrated by the accompanying drawings.

My invention relates to buildings of the class used for the storage and preservation of ice. Its object is to render such buildings fireproof and capable of withstanding both wind pressure from without and ice pressure, as well as insulation pressure, from within; to insulate the building in a superior manner for the purpose of preventing, as far as possible, the shrinkage of the ice by melting; to keep the contained ice separate from the insulating material and clean; to insulate for aridity the material used for thermic insulation; to utilize concrete as the principal building material in the construction of ice-houses; and in general to increase the permanency, efficiency and cleanliness of buildings of this class. To accomplish these objects I incorporate in an icehouse a plurality of reinforced concrete columns, which form the skeleton of the building walls, double external walls of reinforced concrete which are formed integrally with the columns, a roof and ceiling which are united as a truss supported by these walls, and insulating material occupying closed chambers in the walls and next to the ceiling.

Although the accompanying drawings show the best manner in which I have contemplated applying the principles of the invention, yet the latter is not restricted to any specific arrangement or construction of parts, excepting as limitations of that kind are either expressed or necessarily implied in the subjoined claims.

Figure 1 is a horizontal section of an icehouse which is constructed in accordance with the principles referred to. This section may be regarded as taken on the section line A—A of the next following figure. Fig. 2 is a vertical section of the same icehouse on the section line B—B of Fig. 1. Fig. 3 is a vertical section on the section line c—c of Fig. 1. Fig. 4 is a horizontal section of a portion of one of the external walls of the building, on the section line A—A of

Fig. 2. Fig. 5 is a fragmentary rear elevation of the same icehouse.

The entire building comprises a plurality of conjoined unitary portions one of which is shown in Fig. 1. As exhibited in this figure, the front and the rear external walls, denoted by the numerals 1 and 2 respectively, are integrally connected with each other by the end wall 3 and by the transverse partition walls 4'. Likewise they are similarly united by the opposite end wall 4. Each of these walls comprises a pair of thin, uniformly spaced and suitably reinforced wall members, or constituent walls 5 and 6, and a plurality of columns, piers or posts 7, which are formed integrally with these wall members. Each of these columns contains a number of reinforcing steel rods 8 embedded therein, has a broadened base 9, and is adapted to act under lateral pressure as a vertical beam. The wall members 5 and 6 are tied together at intervals by the bolts 11 and are uniformly spaced by the studs 12 which are held in place by these bolts, as shown in Fig. 4. To hold off the ice from the inner face of the internal wall members 5 each of the latter is provided with drip boards 13, which are spaced therefrom. To insulate the concrete columns 7, each of them is protected by a hollow pilaster 14, which is formed integrally with the wall member 6 and has an internal closed chamber 15 broader than the column. This chamber, as well as the closed chambers 16 which are formed between the wall members 5 and 6, is packed full with dry, regranulated cork, or other like insulating material which is denoted by the same numerals 15 and 16. Doorways 17, provided with doors 17', open through the front wall 1 at convenient intervals for the introduction of ice into the building; and similar doorways 17 through the partition walls 4', connect the main internal compartments of the building.

An external stairway 18 leads from the ground 10 to the top of the building at one end 3. The floor 19, sloping downward from the surrounding walls to the middle of each main compartment, rests on a bed of cinders, or other insulating material 20 on the ground beneath. It is formed of reinforced cement, and has a central perforation over the catch-basin 21; and all the catch-basins are drained by a single trapped tile pipe 22. The roof 23 and the ceiling 24, formed of re-

inforced concrete, are united by the sleeved tie-rods 25 as a truss resting on the walls of the building; the upper chord of the truss being represented by the beams 47 forming integral parts of the roof; and the lower chord by the beams 41 forming part of the ceiling. Being so supported, the truss ties together the tops of the described vertical beams of the opposite walls. The chamber, or attic 26, formed between the roof and the ceiling, has swinging doors in the form of the hinged steel screens 27, and is accessible from below by the internal ladder 32. Over the middle of each unitary structure shown in Fig. 1, the roof 23 supports a cupola 28, which is a turret built of incombustible material. On the floor 31 of this cupola stands the motor 33 for operating the connected elevator 34 in the shaft 35; and in the side of this elevator shaft is fixed the vertical stop guide 36, which is adapted to retain on the inclined elevator floor 37 the loads of ice that are lifted thereon, and to permit the same to slide off into the adjacent mouth of the chute 38 in the attic 26 whenever the elevator rises higher than the top of this stop. Conducted by this chute to the door 27, the blocks of ice may be there discharged into an external chute, not shown in the drawings. As shown in Fig. 3, the ceiling 24 has the joists 42 resting thereon, the chambers 43 formed by and between the joists, the cinders, regranulated cork or other thermic insulation 43, occupying those chambers, the board flooring 44 laid on these joists, the oiled paper, or other moisture-excluding insulation 45 covering this floor, and the flat slab or thin covering, of cement mortar 46 on this insulation.

This improved ice house is fireproof by reason of the incombustibility of the principal materials of its construction; is capable of withstanding the lateral pressure of wind and the outward pressure of ice by reason of the reinforced columns incorporated in its walls and acting as vertical beams; resists bursting pressure from the interior of its double walls by the plurality of ties connecting the inner and the outer members of these walls; attains superior thermic insulation by means of the pilasters adjacent to these columns; preserves the efficiency of the insulating medium by protecting the same from moisture; and promotes cleanliness and other sanitary conditions by placing that medium in distributed and closed chambers, separate from the ice.

I claim as my invention--

1. A building of the specified class, comprising concrete walls integrally united, a plurality of horizontal lower beams of the same material supported by the walls, a ceiling of like material supported by those

beams, a floor of like material insulated from the ceiling and supported thereon, a plurality of horizontal concrete upper beams spaced from the lower beams, a roof formed integrally with the upper beams, and means for tying the upper and the lower beams together as chords of a truss spanning the walls.

2. A building of the specified class, comprising vertical walls, a plurality of horizontal beams of reinforced concrete, supported on the walls, a cement ceiling formed integrally with the beams, a plurality of spaced joists laid upon the ceiling, thermically insulating material between the joists, a floor upon the joists, a moisture-excluding cover on the floor, and a wearing slab of cement laid upon the cover.

3. A building of the specified class, comprising walls, a plurality of horizontal lower beams supported by the walls, a ceiling and a floor which are separated from each other by insulating chambers and are supported by the lower beams, a plurality of horizontal upper beams spaced from the lower beams, a roof upon the upper beams, and means for tying the upper and the lower beams together as chords of a truss spanning the walls.

4. A building of the specified class, comprising vertical concrete walls, a plurality of horizontal lower beams terminally supported by the walls, a ceiling secured to the lower beams, a floor supported by the ceiling and insulated therefrom, a covering upon the floor, a plurality of horizontal upper beams spaced from the lower beams, and means for tying the upper to the lower beams as chords of a truss spanning the walls.

5. A building of the specified class, comprising concrete external walls, which are united with each other, a roof and ceiling which are spaced apart and tied together as chords of a truss supported by said walls, thermically insulating material over the ceiling, and means for insulating said insulating material for the exclusion of moisture.

6. A fireproof building of the specified class, comprising external walls which are united with each other, a roof and a ceiling which are spaced apart and tied together as chords of a truss supported by said walls, an insulating medium upon the ceiling, and means for excluding moisture from the insulating medium.

In testimony whereof I subscribe my name hereto in the presence of two witnesses.

CLAUDE A. P. TURNER.

Witnesses:

H. I. CHURCH,  
B. W. ADAMS.