E. BRETNEY.

REFRIGERATING APPARATUS.

APPLICATION FILED AUG. 8, 1911.

1,109,396.

Patented Sept. 1, 1914.

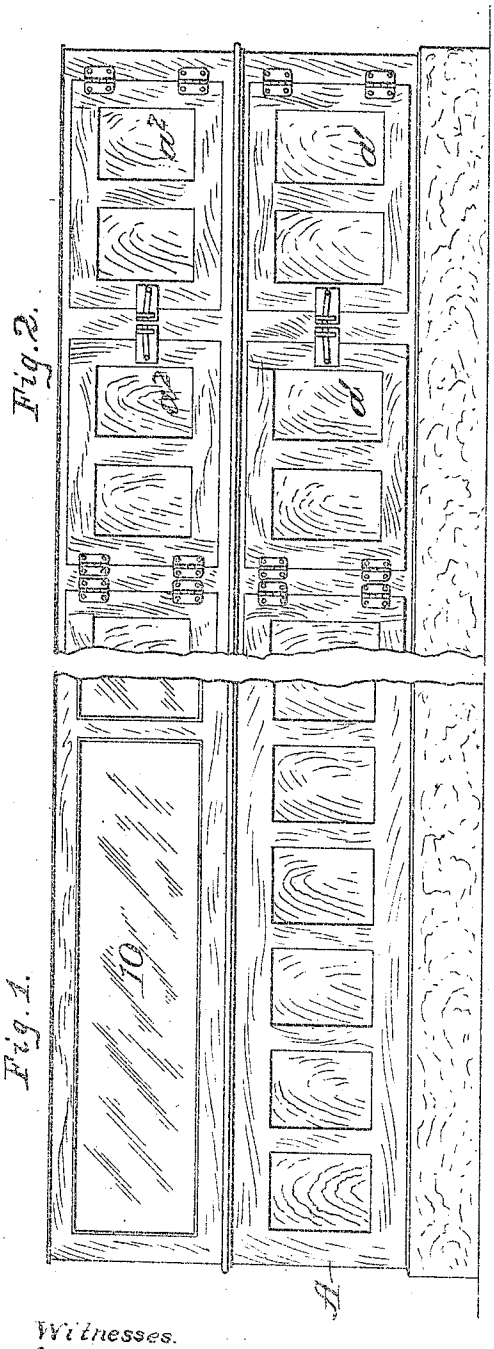


Fig. 1.

Fig. 2.

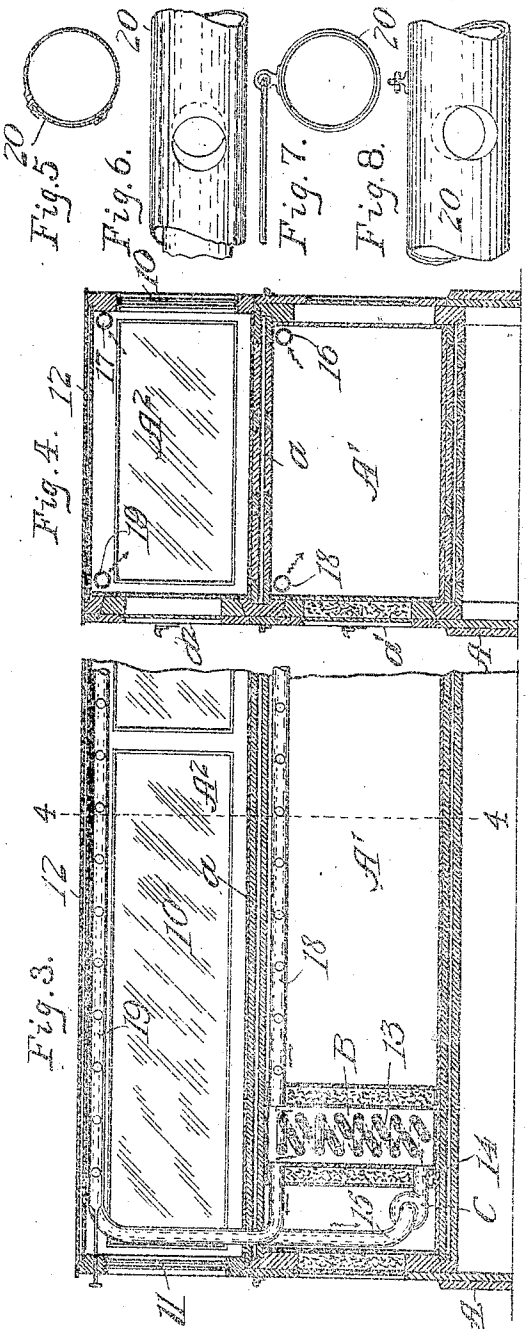


Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

Witnesses.

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REFRIGERATING APPARATUS.

1,109,396. Specification of Letters Patent. Patented Sept. 1, 1914.

Application filed August 8, 1911. Serial No. 642,972.

To all whom it may concern:

Be it known that I, EUGENE BRETNEY, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Refrigerating Apparatus, of which the following is a specification.

My said invention consists in an improved construction and arrangement of parts of refrigerator or cold storage boxes in which is combined a storage compartment and a display compartment, whereby both of said compartments may be maintained at such temperature as may be required for the purpose and of uniform temperature throughout all parts thereof, all as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts, Figure 1, is a front elevation of a section of a refrigerator or cold storage box embodying my said invention, Fig. 2, a rear elevation of the same, Fig. 3, a longitudinal section, Fig. 4, a cross section on dotted lines 4—4 in Fig. 3, Figs. 5 and 6, detailed views illustrating a controlling valve, and Figs. 7 and 8, similar views illustrating a modified form thereof.

In said drawings the portions marked A represent the frame of the box, B a refrigerating compartment, and C a fan casing.

The construction of the box is of the general character of construction of ice boxes and refrigerators and requires no special description except in so far as it relates to the particular features constituting my present invention.

The box is divided by a horizontal partition *a* into two compartments, A^1 and A^2, the compartment A^1 being inclosed by double walls packed with insulating material and intended as the storage compartment. The compartment A^2 has glass front panels 10, glass end panels 11, and glass top panels 12, which convert said compartment into a display compartment, or show-case. Said glass panels are preferably formed double, as shown, in order to protect the interior from the outside temperature. The rear side of the structure is provided with a series of doors, a^1 and a^2, which afford access to the interior compartments A^1 and A^2, respectively.

The refrigerating compartment B is formed in one end of the compartment A^1 and comprises double walls filled with insulating material. It contains a refrigerating coil 13 which leads from an ammonia condenser, or other source of refrigerant supply (not shown), and through which the refrigerant is circulated in the well known manner.

The fan casing C has a discharge pipe 14 leading into the lower side of the refrigerating chamber B and an air inlet pipe 15 connected with its eye. The fan itself is not shown but, as will be readily understood, is of any approved construction and operated by any convenient power. Suction pipes 16 and 17 are located in the upper corners of the compartments A^1 and A^2, respectively, on one side, while discharge pipes 18 and 19 are located in the corresponding corners on the opposite side of said compartments. The pipes 16 and 17 are connected to inlet pipe 15 and pipes 18 and 19 lead from the upper end of refrigerating compartment B. Each of said pipes is provided with a series of apertures located at short intervals throughout its length, and a movable pipe section, or valve 20, with corresponding apertures is mounted over said apertures. In Figs. 5 and 6 such pipe section, or valve, is shown as adapted to slide longitudinally over the pipe, while in Figs. 7 and 8 I have shown it as adapted to turn around said pipe. By such means the size of the apertures may be adjusted to control both the inlet to and the discharge from the several pipes, as may be desired, and the temperature of each compartment regulated to suit its purposes.

In operation, the refrigerant being in active circulation through coil 13, the temperature of compartment B is lowered to the degree desired. The fan in casing C is started in operation and serves to draw the air from compartments A^1 and A^2 through pipes 16 and 17 into pipe 15 and discharge the same into the lower side of compartment B. The circulation of the air through said compart-

ment, passing among the refrigerating coils therein, serves to lower the temperature of the air, which is then forced through the pipes 18 and 19, respectively, and discharged under pressure into the upper corners of said compartments A^1 and A^2 on the opposite side from the suction pipes 16 and 17. The cold air coming in on one side will fall to the bottom of the compartments while the warmer air will be drawn out through pipes 16 and 17, and the circulation thus constantly maintained and the compartments kept at whatever temperature may be desired. By the adjustment of valves 20 the volume of cold air circulated in any compartment may be regulated and its temperature maintained to suit its special needs. The use of ice is thus avoided, the apparatus is kept sweet and clean at all times and free from the moisture incident to the use of ice as a refrigerant.

By the proper adjustment of the regulating valves any circulation found most advantageous for the immediate purpose of any compartment of the apparatus may be maintained. As the several pipes 16, 17, 18 and 19 extend the entire length of the several compartments the circulation of the air is kept uniform throughout the entire structure and the temperature in all parts of each of the several compartments is thus maintained at a uniform degree. The air within the compartments being under pressure outside air cannot rush in and materially change the temperature when the door of any compartment is opened for ordinary purposes. It will be understood, of course, that any number of compartments may be used that may be found advantageous and that the illustration of only two is merely for the purpose of illustrating the invention as the multiplying of the compartments will not in any manner modify the operation of the apparatus.

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

1. A combined refrigerator and display case consisting of a unitary structure comprising a multiplicity of compartments part of which are provided with transparent sides for displaying the contents and part of which are inclosed by insulated double walls, a refrigerating compartment containing a refrigerating coil, a system of air circulating pipes a part of which lead from said refrigerating compartment to discharge into the storage and display compartments of the apparatus and part of which lead from said compartments back to a fan, and said fan arranged to discharge into said refrigerating compartment, substantially as set forth.

2. A refrigerator consisting of a unitary structure comprising several compartments each separated from the other by imperforate insulated walls, a refrigerating compartment within said structure surrounded by insulated walls, a refrigerating coil mounted in said compartment, a rotary fan mounted within said structure and connected to discharge into said refrigerating compartment, pipes leading from said refrigerating compartment through the upper side of the other compartments and formed with a series of discharge apertures located at intervals throughout their length, and another series of pipes located in the opposite corners of the upper side of said other compartments having a series of inlet apertures at intervals throughout their length and communicating with the eye of said rotary fan, whereby the air from the refrigerating compartment is forced into the upper side of said other compartments at one side and the warmer air withdrawn from the opposite side and forced through said refrigerating compartment, substantially as set forth.

3. A refrigerator consisting of a unitary structure comprising several compartments and containing the refrigerating apparatus, the upper compartments being formed with transparent sides to serve as display compartments and the lower compartments inclosed by non-transparent sides to serve as storage compartments, a refrigerating compartment forming a part of the structure and separated by insulated walls from the other compartments, air circulating pipes extending from the upper portion of said refrigerating compartment throughout the upper portions on one side of said display and storage compartments, another series of pipes communicating with the lower portion of said refrigerating compartment and extending throughout said several compartments in the opposite upper corner thereof said several pipes being formed with apertures at intervals throughout their length, and a rotary fan interposed in said air circulating pipes for forcing the air in one direction and creating suction in the other direction whereby a constant circulation is maintained through said refrigerating compartment and through said several storage and display compartments the cold air being discharged in the upper corner on one side of said compartments and the warmer air withdrawn from the opposite upper corner, substantially as set forth.

4. A refrigerator comprising a refrigerating compartment and storage compartments, air circulating pipes leading to and arranged to discharge into and from said refrigerating compartment and into and from the other storage compartments of the refrigerator, said pipes being provided with

a series of apertures arranged at intervals throughout the length of the refrigerator storage compartments, and valves arranged to control the size of said apertures, substantially as set forth.

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana, this 5th day of August, A. D. nineteen hundred and eleven.

EUGENE BRETNEY. [L. S.]

Witnesses:
E. W. BRADFORD,
L. M. PATTERSON.