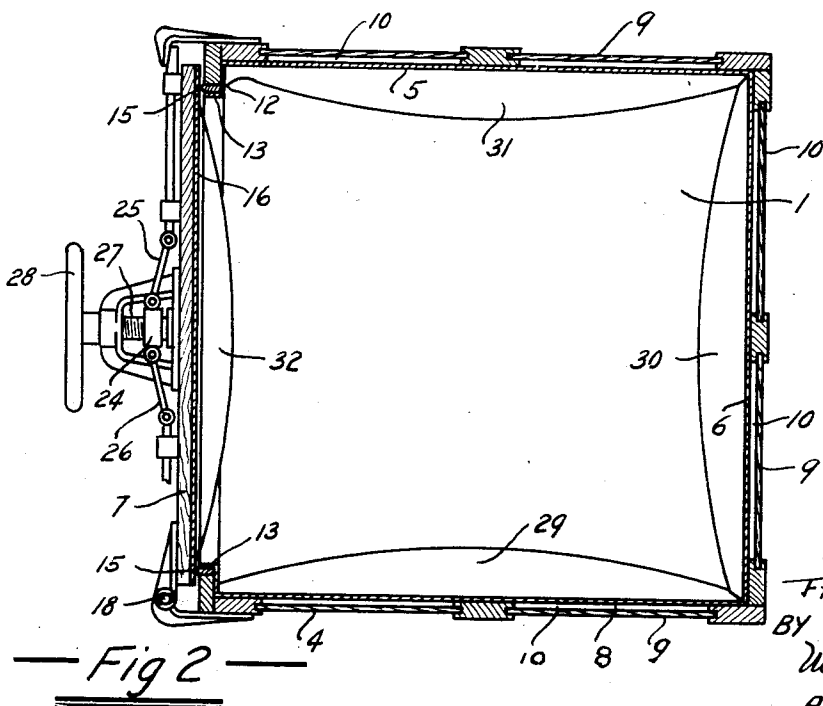
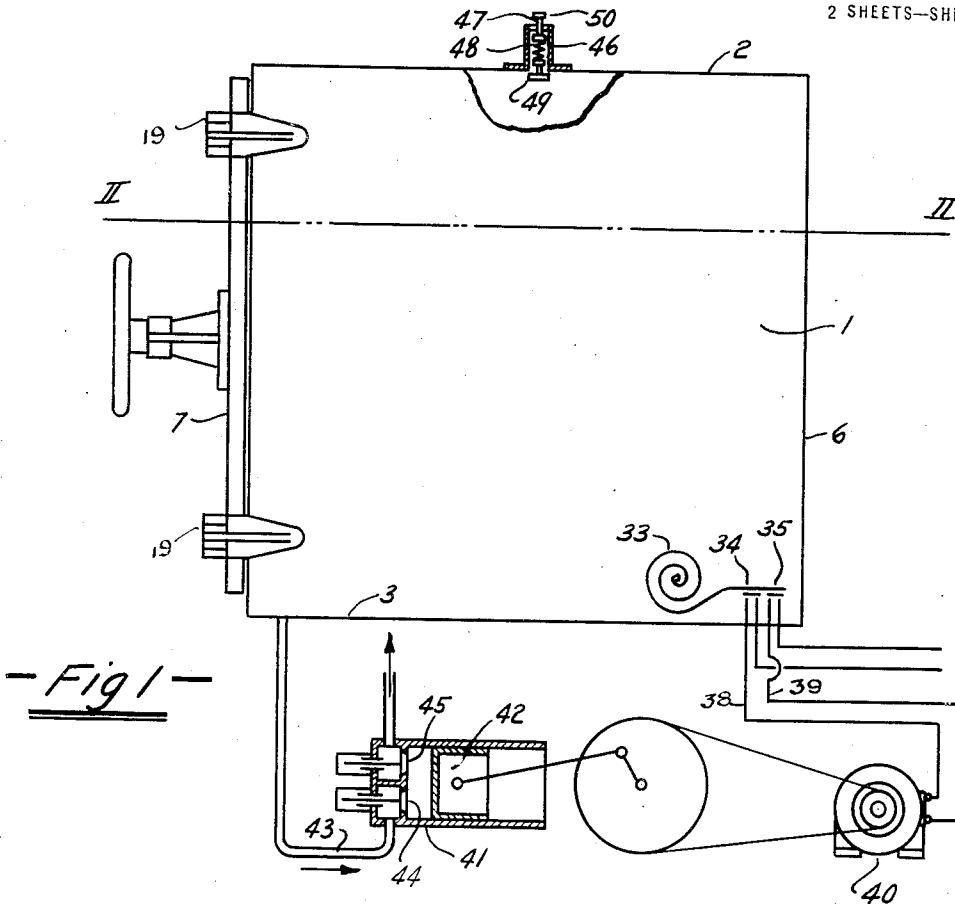


F. MOON.
MEANS FOR REFRIGERATION.
APPLICATION FILED NOV. 4, 1920.

1,404,400.

Patented Jan. 24, 1922.

2 SHEETS—SHEET 1.



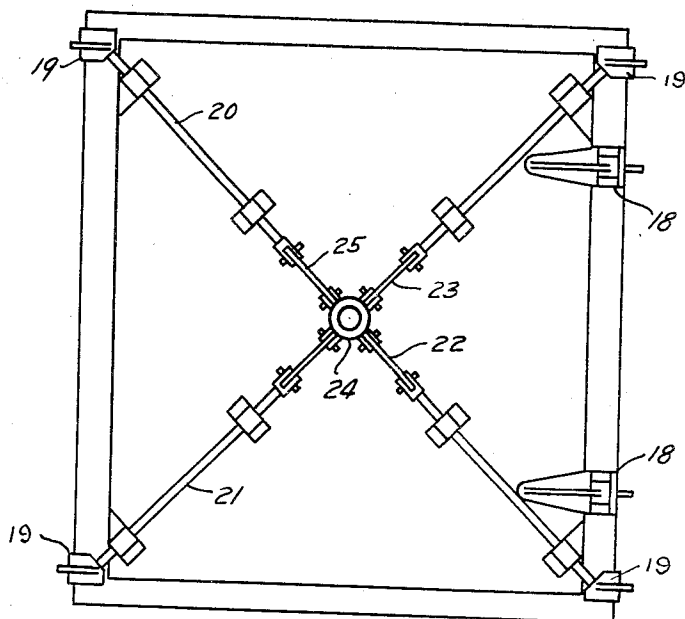
INVENTOR
Frank Moon
BY
Miller & Henry
ATTORNEYS

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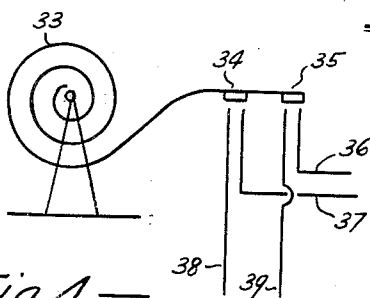
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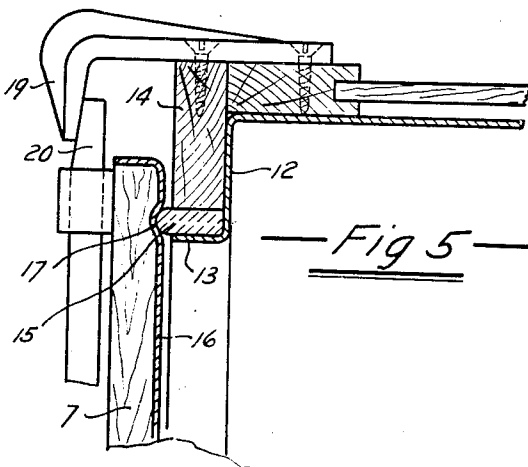
2 SHEETS—SHEET 2.



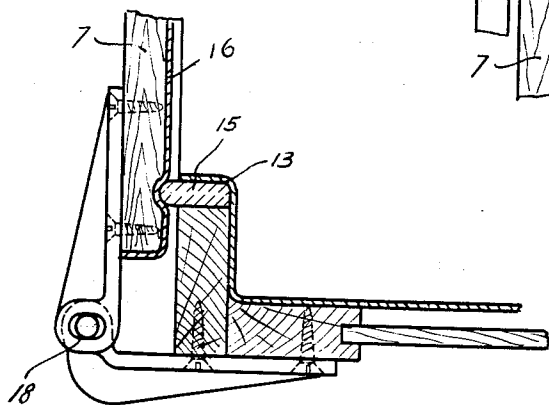
— Fig 3 —



— Fig 4 —



— Fig 5 —



— Fig 6 —

INVENTOR
 Frank Moon
 BY Miller & Henry
 ATTORNEYS

UNITED STATES PATENT OFFICE.

FRANK MOON, OF OAKLAND, CALIFORNIA, ASSIGNOR OF ONE-HALF TO AUGUSTUS M. TUREL, OF SAN JOSE, CALIFORNIA.

MEANS FOR REFRIGERATION.

1,404,400.

Specification of Letters Patent. Patented Jan. 24, 1922.

Application filed November 4, 1920. Serial No. 421,677.

To all whom it may concern:

Be it known that I, FRANK MOON, a citizen of the United States, and resident of Oakland, Alameda County, California, have invented new and useful Improvements in Means for Refrigeration, of which the following is a specification.

My invention has for its object the provision of a compartment automatically retained at a temperature suitable for the preservation of food stuffs and the like; also means whereby the said compartment may be suitably sealed and also the provision of means whereby it may be automatically retained at a safe degree of pressure less than atmospheric. Other objects will appear from the drawing and specification.

Figure 1 is a side elevation partly diagrammatic of my refrigerator and operating mechanism therefor.

Fig. 2 is a section plan on the line 2—2 of Fig. 1.

Fig. 3 is a front view of Fig. 1 and at right angles thereto.

Fig. 4 is a detailed part of the temperature and electrical connections, being an enlarged view of a portion of Fig. 1.

Fig. 5 is an enlarged detail showing the means of securing and sealing the cover or door.

Fig. 6 is a detail of the hinge portions of the cover or door of Fig. 2.

Throughout the figures similar numerals refer to identical parts.

The numeral 1 indicates a refrigerator compartment encased by the top 2, bottom 3, side walls 4 and 5 and back wall 6 and door or cover 7. These may be suitably heat insulated in any of the well known ways and I prefer to form them as with a metallic lining 8, outer wall 9, 9, shown as panels and having an air space therebetween indicated by the numeral 10. This air space it will be understood may be made of larger dimensions or may be filled with sawdust, mineral wool or other non-heat conducting substance whereby the refrigerator compartment 1 when once cool retains its lower temperature most efficiently. I prefer to seal or bend the lining 8 at the corners and to form it as at 12, 13, so that with the frame member 14 a suitable space is provided which is to be filled with a packing as rubber at 15, 15. This packing is arranged to normally project beyond the surface of the member

14 so as to provide a seat against which the plate 16 of the cover or door is to be clamped. If desired, a suitable groove for seating against the packing may be formed in 16 as shown at 17 concentric with the packing 15, 15, thereby supporting the packing against destruction when high vacuum is employed. The door of cover 7 I prefer to mount upon hinges as 18, having a pintle of smaller dimensions within the opening 18, in the hinge strap whereby displacement of the door may be attained to secure a seating against the packing 15, 15. At 19, 19, 19, 19, are shown lugs or dogs secured to the walls and formed with a sloping surface (see Fig. 5) so that the bolt members 20, 21, 22, 23 on sliding thereunder compress the plate 16 against the packing 15, 15. In this way the door 7 seals the compartment against the packing 15, 15 and the latter under the compression before mentioned forces the said packing against the edges 13, 13 of the plate 8. The bolt members 20, 21, 22, 23 are operated to engage the dogs 19, 19, 19, 19, by the traveling nut 24 and toggle members as 25 and 26 through the rotation of the screw stem 27 and hand wheel 28.

In order to support the walls 4, 5, 6, 7, top and bottom 2 and 3 respectively, against compression strains, struts may be introduced as 29, 30, 31 and 32, and I prefer to form these so that they may also serve as supports for shelves in the refrigerator compartment 1. At 33 is shown a temperature coil of any well known type (see also Fig. 4) having contact members 34 and 35 whereby the electrical connections 36 and 37 may be switched on or off of the motor leads 28 and 39 respectively, thus energizing the motor from a source of electrical energy not shown, when the temperature varies from a predetermined point. The operation of the motor 40 results in the production of a vacuum condition of the desired degree within the chamber 1 through the action of the vacuum pump 41 within which the piston 42 operates; and upon an upstroke of the piston 42 air is withdrawn from the compartment 1 through the pipe connection 43 and one-way valve 44 and upon the down stroke of the piston 42 the said air is expelled from the pump 41 through the one-way valve 45 in the well-known way. At 46 I provide a valve 49 which is retained upon its seat by the

action of the adjustable spring 48 under the control of the thumb screw 47 so that upon the degree of vacuum in the chamber 1 being reduced to a predetermined degree the atmospheric pressure on the valve 49 presses the said valve away from its seat and compresses the spring 48 allowing air to enter the chamber 1 until the vacuum therein has been reduced. When due to the increased temperature of the incoming air contacts will be made at 34 and 35, the motor 40 will operate upon pump 41 and abstract the said air, again reducing the temperature on the inside of the chamber 1. In order to open the door against the atmospheric pressure during vacuum condition in the chamber 1 it is only necessary to rotate the hand wheel 28 when the nut 24 will travel up on the screw thread 27 and through the movement of the toggles 25 and 26 the bolts 20, 21, 22, 23, will be withdrawn from the dogs 19, 19, 19, 19. To relieve the atmospheric pressure against the door the button 50 operating the valve 49 may be depressed when atmospheric pressure will be admitted to the chamber 1 and the door 7 may be freely swung upon the hinges 18. The temperature within the chamber 1 will thus be automatically retained at the desired degree through the action of the vacuum pump 41, as whenever the temperature is too high the action of the said pump will withdraw the air, and will abstract the necessary heat units so that the temperature within the container will be re-established and thereafter maintained at the predetermined low degree for the preservation of the products contained therein.

I claim:

1. A container comprising a compartment adapted to sustain a predetermined degree of vacuum, a door adapted to egress and ingress to said compartment and sealing means between said compartment and said door and

a vacuum producing device communicating with said compartment whereby a predetermined degree of vacuum may be established in said compartment and a temperature actuated switch whereby the vacuum device is caused to be operated when the temperature within the container falls below a predetermined degree.

2. A container comprising a compartment adapted to sustain a predetermined degree of vacuum, a door adapted to egress and ingress to said compartment and sealing means between said compartment and said door and a vacuum producing device communicating with said compartment whereby a predetermined degree of vacuum may be established in said compartment and a safety valve whereby air is admitted when the said predetermined degree of vacuum is exceeded and a temperature actuated switch whereby the vacuum device is caused to be operated when the temperature within the container falls below a predetermined degree.

3. A container comprising a compartment adapted to sustain a predetermined degree of vacuum, a door adapted to egress and ingress to said compartment and sealing means between said compartment and said door and a vacuum producing device communicating with said compartment whereby a predetermined degree of vacuum may be established in said compartment and a safety valve whereby air is admitted when the said predetermined degree of vacuum is exceeded and a temperature actuated switch whereby the vacuum device is caused to be operated when the temperature within the container falls below a predetermined degree, and an externally operable button engaging said valve whereby air may be admitted to said container to break the said vacuum in said container.

FRANK MOON.