

Sept. 30, 1941.

E. M. FRITZ

2,257,374

COLD STORAGE CABINET

Filed Aug. 30, 1939

2 Sheets-Sheet 1

Fig. 1.

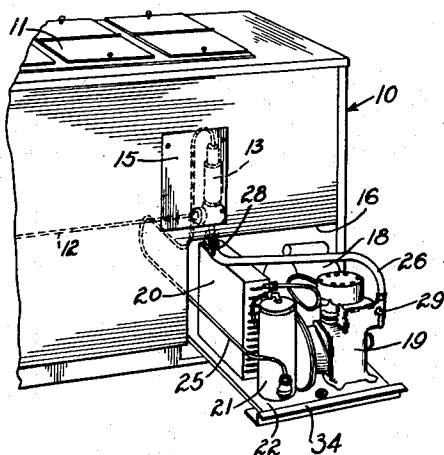


Fig. 4.

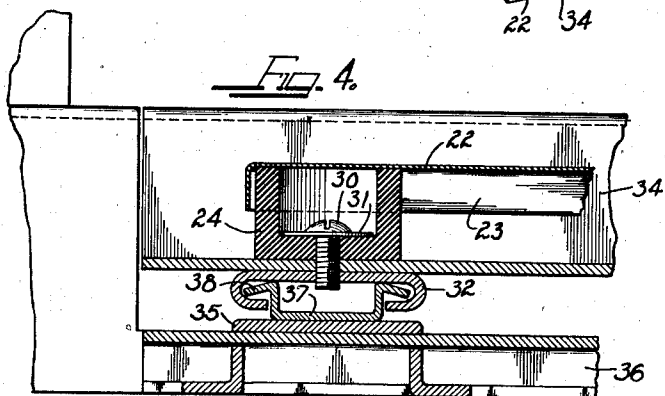
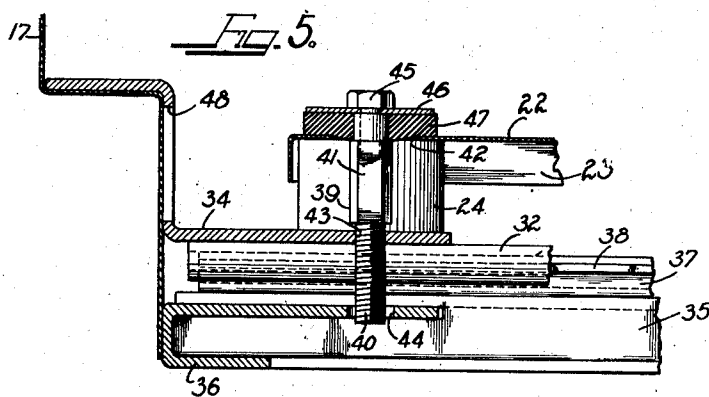


Fig. 5.



EDWARD M. FRITZ

Charles M. Fritz

Sept. 30, 1941.

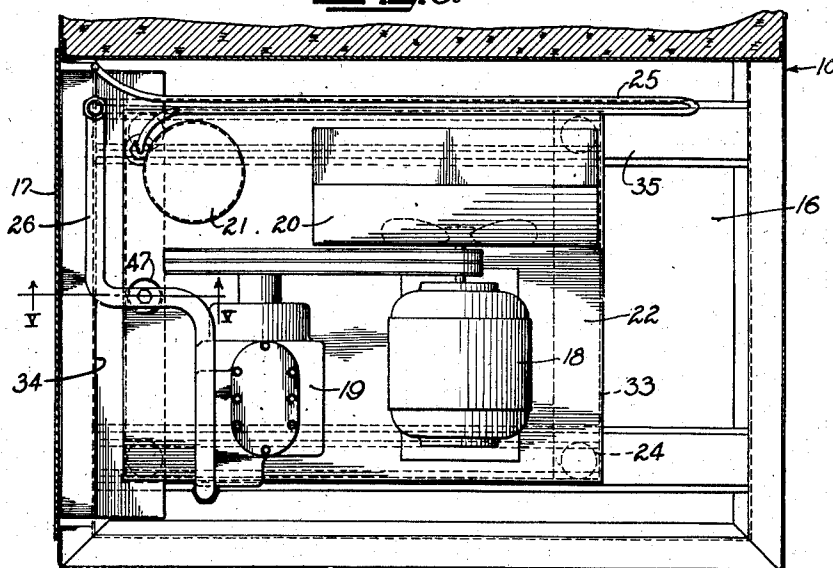
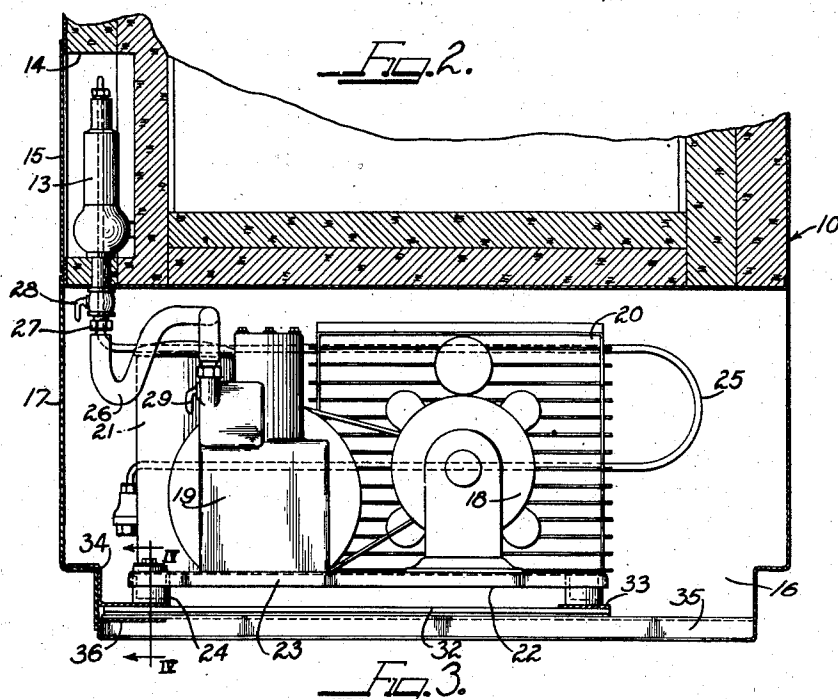
E. M. FRITZ

2,257,374

COLD STORAGE CABINET

Filed Aug. 30, 1939

2 Sheets-Sheet 2



EDWARD M. FRITZ

EDWARD M. FRITZ

Charles M. Wells

ALLS

UNITED STATES PATENT OFFICE

2,257,374

COLD STORAGE CABINET

Edward M. Fritz, Grand Rapids, Mich., assignor
to Grand Rapids Cabinet Company, Grand
Rapids, Mich., a corporation of Michigan

Application August 30, 1939, Serial No. 292,601

5 Claims. (Cl. 62-116)

The present invention relates in general to refrigerated cabinets for the storage of foods and the like, and is particularly concerned with improved mounting means therein for a mechanical refrigerating unit.

In the past, such cabinets have been constructed with a separate compartment for housing the mechanical refrigerating unit, and while it has been the practice to provide a removable panel in the cabinet wall admitting of access to the refrigerating unit compartment, this panel has not been so located as to enable convenient access to the unit compartment, particularly in cases where the installation requires that the end of the cabinet containing the unit be placed against a wall or other obstruction.

Moreover, due to the fact that the refrigerating unit compartment is necessarily made no larger than necessary to accommodate the unit, there is insufficient clearance around the unit to permit its being inspected and serviced freely while within its compartment. Where an opening in the end of the cabinet is not accessible it may be necessary to disconnect the unit from the cabinet and remove holding down bolts or other means utilized to secure the unit in its compartment, before it can be removed to the exterior of the compartment where its various parts may be readily accessible. Such procedure in the arrangements as presently constructed has been very inconvenient and has entailed the expenditure of considerable time and labor.

With the foregoing as well as other objections to the present mounting arrangement, the here-indescribed invention contemplates improved mounting means in the cabinet for the refrigerating unit, which will enable its being easily removed for inspection and service; which embodies improved means for connecting the unit to the cooling coil parts in the cabinet and enables removal of the unit with substantially little or no loss of refrigerating medium.

A further object of the invention is to provide novel locking means for securing the unit and its mounting against movements during shipment, but which may easily be unlocked to release the unit for removal from its compartment, whenever desired.

Other objects and features of the invention will more fully appear from the following detailed description taken in connection with the accompanying drawings which illustrate the preferred embodiment thereof, and in which:

Figure 1 is an isometric view looking at the rear side of a refrigerated cabinet embodying

the features of the present invention and showing the mechanical refrigerating unit partially withdrawn from its compartment;

Figure 2 is an enlarged fragmentary view of the cabinet, including a vertical section taken through the refrigerating unit compartment;

Figure 3 is a similar view except that the section through the refrigerating unit compartment is taken horizontally;

Figure 4 is an enlarged fragmentary view, partly in section, showing details of the mounting for the refrigerating unit, taken substantially on line IV-IV of Figure 2; and

Figure 5 is a sectional view, taken substantially on line V-V of Figure 3.

As shown on the drawings:

Referring to Figure 1 of the drawings, there is illustrated a cold storage cabinet, generally indicated at 10, such as utilized for the storage of foods, ice cream, etc., this cabinet being fitted with suitable closure members 11 in its top surface for providing admittance to the interior of the cabinet for the placing of foods therein or removing them.

The walls of the cabinet are insulated in the usual manner and may contain a series of pipes, as indicated in dotted lines by the numeral 12, which may constitute the evaporator of a cooling system. The evaporator, as is the usual practice, may be connected with a suitable expansion and control valve 13 which may be mounted in a well or compartment 14 in the cabinet wall, this compartment being preferably disposed in the rear wall of the cabinet and normally closed by a plate 15.

At one end of the cabinet, there is provided a compartment 16 for the mechanical refrigerating unit of the cabinet, this compartment having its entrance in the rear wall of the cabinet. This compartment need not be insulated relative to the exterior, and may be normally closed at its entrance by a suitable plate or panel 17.

Although the invention may be utilized with various types of refrigerating units, it has been shown in the present instance as being utilized with a mechanical refrigerating unit of the compressor-condenser-evaporator type.

As shown in Figures 2 and 3, the unit in general comprises a driving motor 18 which is connected to a compressor 19, this compressor being arranged to supply refrigerant to a condenser 20 which is in turn connected with a suitable receiver 21. The various parts of the unit are supported on a base plate 22 which may be constructed of comparatively light metal and have

its peripheral edge margins deflected to form a peripherally extending flange 23 for strengthening the same, and maintaining the base against lateral sliding movement on resilient supporting members 24.

The receiver 21 is connected through a tubular pipe 25 to the valve 13. This pipe, as is the usual practice, is arranged to conduct the refrigerating medium to the evaporator portion of the system, which, in the particular type of system being described, will conduct the refrigerant while in a liquid state.

The pipe 25 is of relatively small construction, namely, one-fourth inch in diameter, and is therefore inherently flexible. By making the pipe connection 25 sufficiently long, the refrigerating unit may be removed from its compartment without having to disconnect the pipe either at the valve 13 or where it is connected to the receiver.

The suction side of the compressor 19 is connected through a pipe 26 of larger diameter, namely one-half inch, and is covered with some material such as rubber. Due to this pipe being less flexible, due to its larger size, provision is made for disconnecting it at the valve 13 by providing a suitable coupling 27. Since the pipe 26, in the particular type of system being described, is on the low side and forms a suction line for the return of the refrigerating medium in a gaseous state to the compressor, suitable cut-off valves 28 and 29 are provided at the valve 13 and compressor 19, respectively, for isolating the pipe 26 with reference to the system.

It will therefore be apparent with this arrangement that, when the valves 28 and 29 are closed, the pipe may be disconnected by means of the coupling 27 from the valve 13, thus enabling withdrawal of the refrigerating unit. Moreover, since the refrigerant is in a gaseous state and the pipe 26, when cut off by the valves, would contain an inappreciable amount of refrigerating medium so that little or none of the refrigerating medium would be wasted.

Where the refrigeration capacity needed permits of the use of a suction line of smaller size and greater flexibility or of flexible tubing, the cut-off valves may be dispensed with and the unit may be pulled out for inspection while operating.

The entrance to the unit compartment is placed at the rear wall of the cabinet in order that admittance to the unit cabinet may be effected, even though in a particular cabinet installation the cabinet end wall may be placed in abutting relation with a wall or other structure.

The details of the unit mounting, which permit easy withdrawal of the unit from its compartment for inspection and servicing will now be described.

The resilient supports 24 are constructed of a material such as rubber. These supports are cup-shaped and are disposed with their open ends uppermost, each cup being retained by an anchor screw 30 which is preferably disposed with its head abutting a washer 31 disposed within the cup member.

In the present instance, four resilient supporting members 24 are provided, and these supporting members are disposed at the respective corners of the base plate 22. The screws 30 may also be utilized for securing a pair of groove forming longitudinally extending members 32—32 in spaced relation and connected at the inner end of the unit to a transverse connecting

bar 33, and at the forward end of the unit to a transverse connecting bar 34.

At the bottom of the unit compartment is a stationary frame structure, which may be formed as a part of the cabinet frame work. In the present instance, this frame structure includes a pair of channel members 35—35 which are disposed to extend longitudinally of the unit compartment and are spaced apart to coincide with the spacing of the groove forming members 32—32. At their outermost ends, these channels 35 are connected with a transversely extending channel member 36 to form a rigid construction.

Extending along the upper surfaces of each of the channel members 35 is a track member 37 having laterally deflected wing portions 38 for interlocking sliding engagement with the peripheral margins of the adjacent groove forming members 32, the peripheral margins of this member being preferably bent back upon themselves to extend over the wing portions 38—38 of the track members and provide a sliding connection therewith. With this arrangement, it will be noted that the groove forming members cannot be removed from the associated track members by an upward or lateral movement thereof. On the other hand, the groove forming members and their connected parts may be slid along the track members, thus enabling the unit by sliding movement to be withdrawn from its cabinet whenever it is desired to inspect or service the refrigerating unit.

During shipment of the cabinet with the unit mounted therein, it is of course desirable to not only anchor the base plate 22 against becoming displaced from the resilient supporting members 24, but also it is desirable to provide means to prevent sliding movement of the unit on the track members 37.

In the present instance there is provided a locking stud or bolt 39 having a threaded shank portion 40 and an elongate head portion 41 which is preferably of polygonal construction for receiving a suitable wrench or tool. This locking stud is arranged to be inserted endwise through an opening 42 in the base plate 22 and have its threaded shank screwed into an aligned threaded aperture 43 in the transversely extending bar 34. Below the opening 43 is an aperture 44 in the member 36, which will be in alignment with and receive therein the end of the threaded shank portion 40, when the unit is in position in its compartment and the stud 39 is screwed downwardly until its head portion abuts the upper surface of member 34. This will lock the track and groove members against sliding movement.

For retaining the base plate against movement from the resilient supporting members, the head portion 41 of the locking stud is internally threaded at its upper end for receiving a bolt 45 which may cooperate with a washer 46 for securing a resilient washer 47 of a material such as rubber against the upper surface of the base plate 22. Thus, the base plate will be resiliently retained against removal from the resilient supporting members 24.

Access to the head 41 of the locking stud may be facilitated by providing an opening as shown at 48 in the member 34, this opening being sufficiently large to enable the insertion of a wrench or tool therethrough for engagement with the head 41 of the locking stud.

The locking stud is particularly useful for

preventing movements of the refrigerating unit when the cabinet is being shipped, and it will be apparent that by removal of the locking stud, the unit will be released so that it may be easily removed from its compartment whenever it is desired to inspect or service the same, and that the only prerequisite to such removal is the closing of the valves 28 and 29 and the disconnection of the coupling 27.

From the foregoing description, it will be apparent that the present invention provides in a cooling cabinet improved mounting means for a refrigerating unit, which will enable the units being easily removed for inspection and service; which embodies improved means for connecting the unit to the cooling coil parts in the cabinet and enables removal of the unit with substantially little or no loss of refrigerating medium; and which includes novel locking means for securing the unit and its mounting against movement during shipment, but which may easily be unlocked to release the unit for removal from its compartment, whenever desired.

Now, it is, of course, to be understood that although I have described in detail the preferred embodiment of my invention, the invention is not to be thus limited, but only insofar as defined by the scope and spirit of the appended claims.

I claim as my invention:

1. In combination with a cabinet having a plurality of compartments, a refrigerating unit in one of said compartments, cooling means in another of said compartments, a pressure connection including an expansion valve and a suction connection between said unit and said cooling means for a refrigerating medium, said pressure connection being flexible and of sufficient length in the said one of said compartments to enable removal of the unit from its compartment without its being disconnected, a movably supported base for said unit enabling withdrawal of the unit from its compartment, and cut-off valves within said one compartment for isolating a portion of the suction connection therein, whereby it may be disconnected with a minimum loss of refrigerating medium.

2. A refrigerating unit mounting comprising a pair of spaced groove forming members, a pair

of rails slidably associated with said grooves and respectively interlocked against lateral removal therefrom, resilient members carried by the groove forming members, and a unit base plate supported on said resilient members in spaced relation to said groove members.

3. A refrigerating unit mounting comprising a pair of spaced groove forming members, a pair of rails slidably associated with said grooves and respectively interlocked against lateral removal therefrom, resilient members carried by the groove forming members, a unit base plate supported on said resilient members in spaced relation to said groove members, and means for locking the rail and groove members against sliding movements.

4. In an apparatus for removably mounting a refrigerating unit in a cabinet compartment having an access opening therein, a member extending into said compartment and constituting a fixed part of the cabinet structure, said member having an aperture therein, a frame structure supported for sliding movements into and out of said compartment through said opening, resilient pads carried by the frame structure, a base plate having the refrigerating unit secured thereto, said plate being arranged to removably rest on said pads, a stud member carried by the frame structure and mounted for selective movements into and out of said aperture, and means associated with said stud for selectively securing the base plate against removal from the resilient pads and releasing the base plate for free vibratory movements on the pads or removal therefrom.

5. Means for removably mounting a refrigerating unit in a cabinet compartment having an access opening therein comprising track members extending into the compartment, laterally extending downwardly turned flanges on said track members, means carrying a refrigerating unit slidably mounted on said track members, and means associated with said last mentioned means engaged around the edges of said flanges for normally preventing substantial displacement of said unit carrying means in a lateral or upward direction.

EDWARD M. FRITZ.