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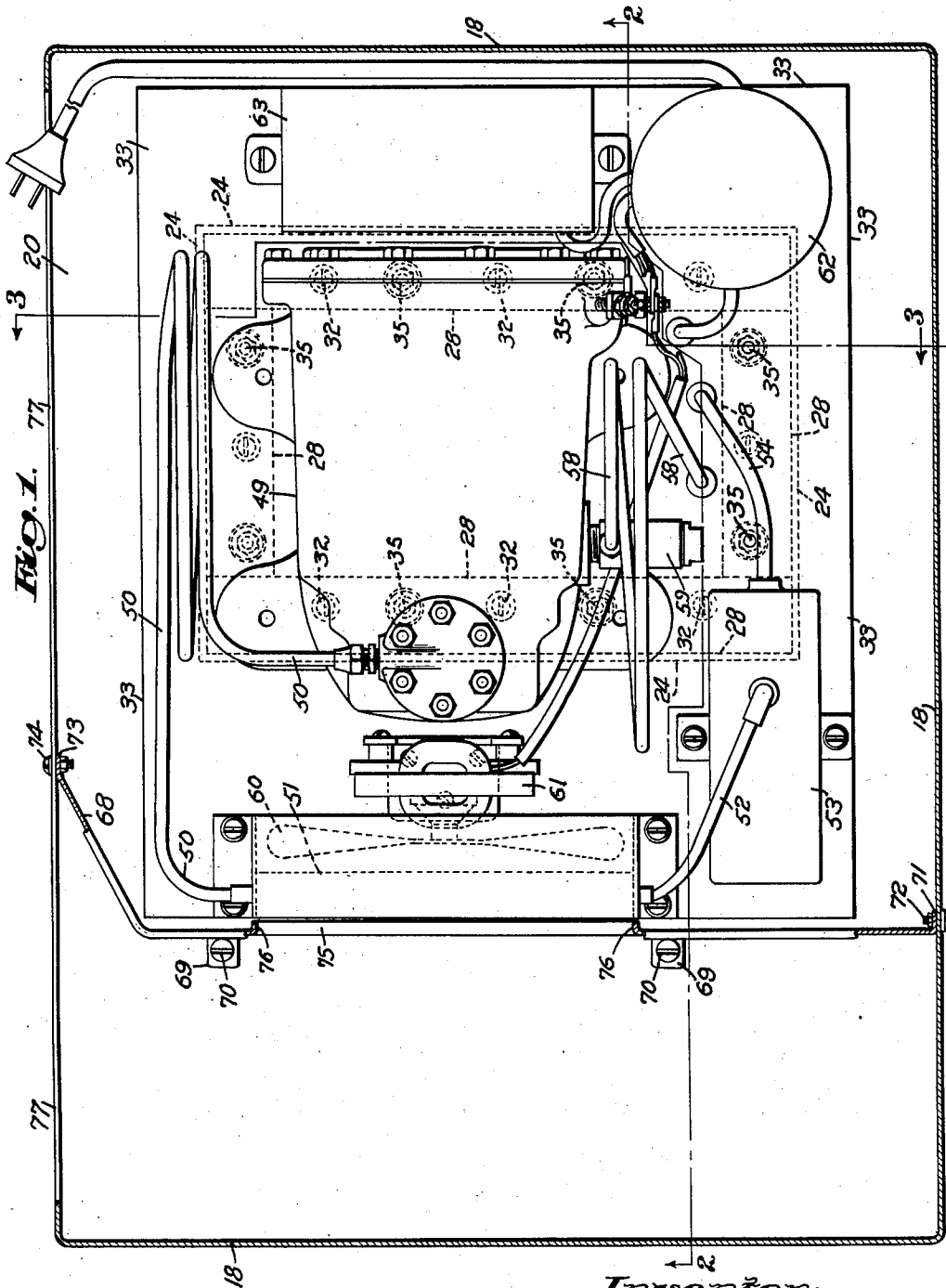
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1,992,298

REFRIGERATOR

Filed Oct. 3, 1932

5 Sheets-Sheet 1



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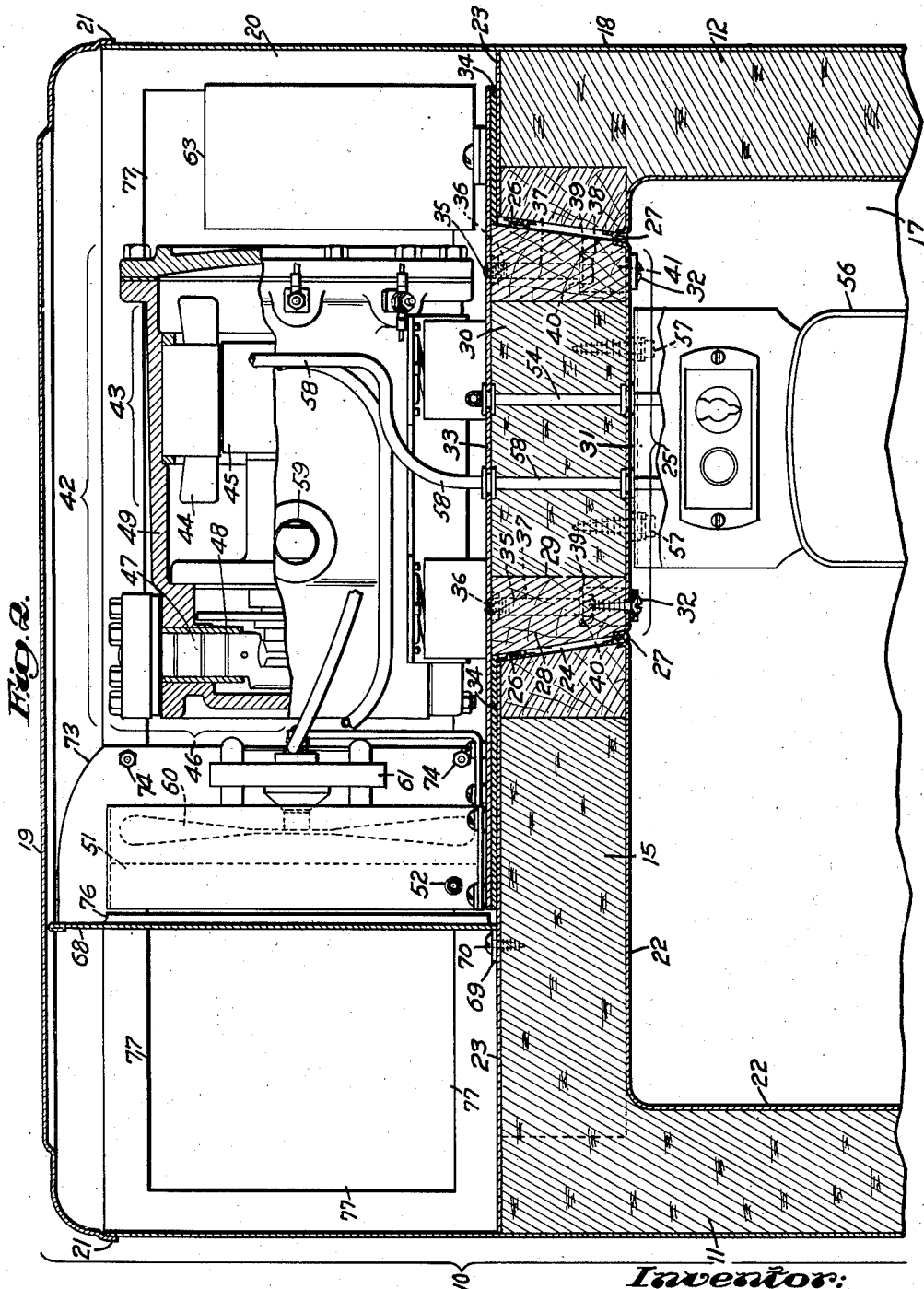
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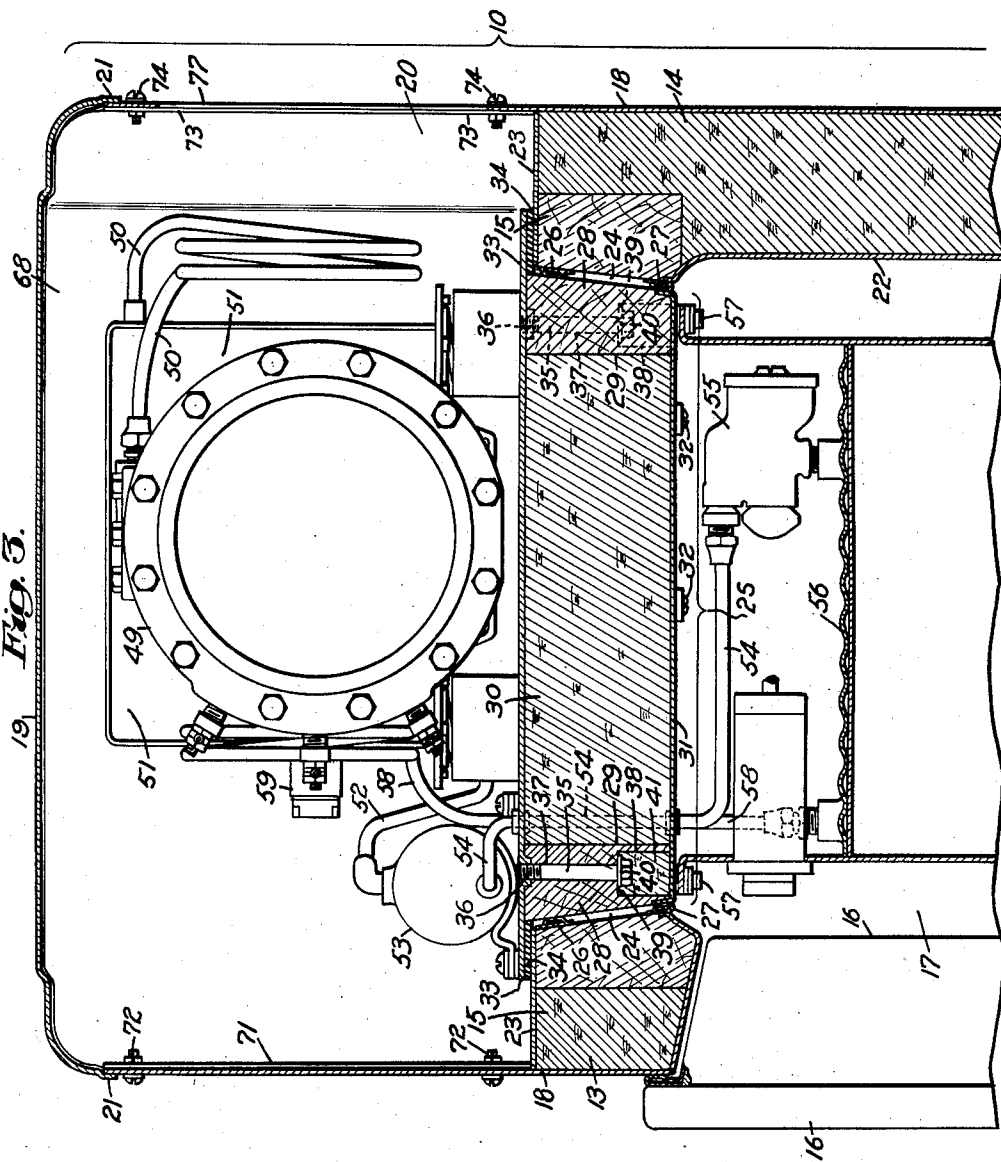
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Fig. 3.



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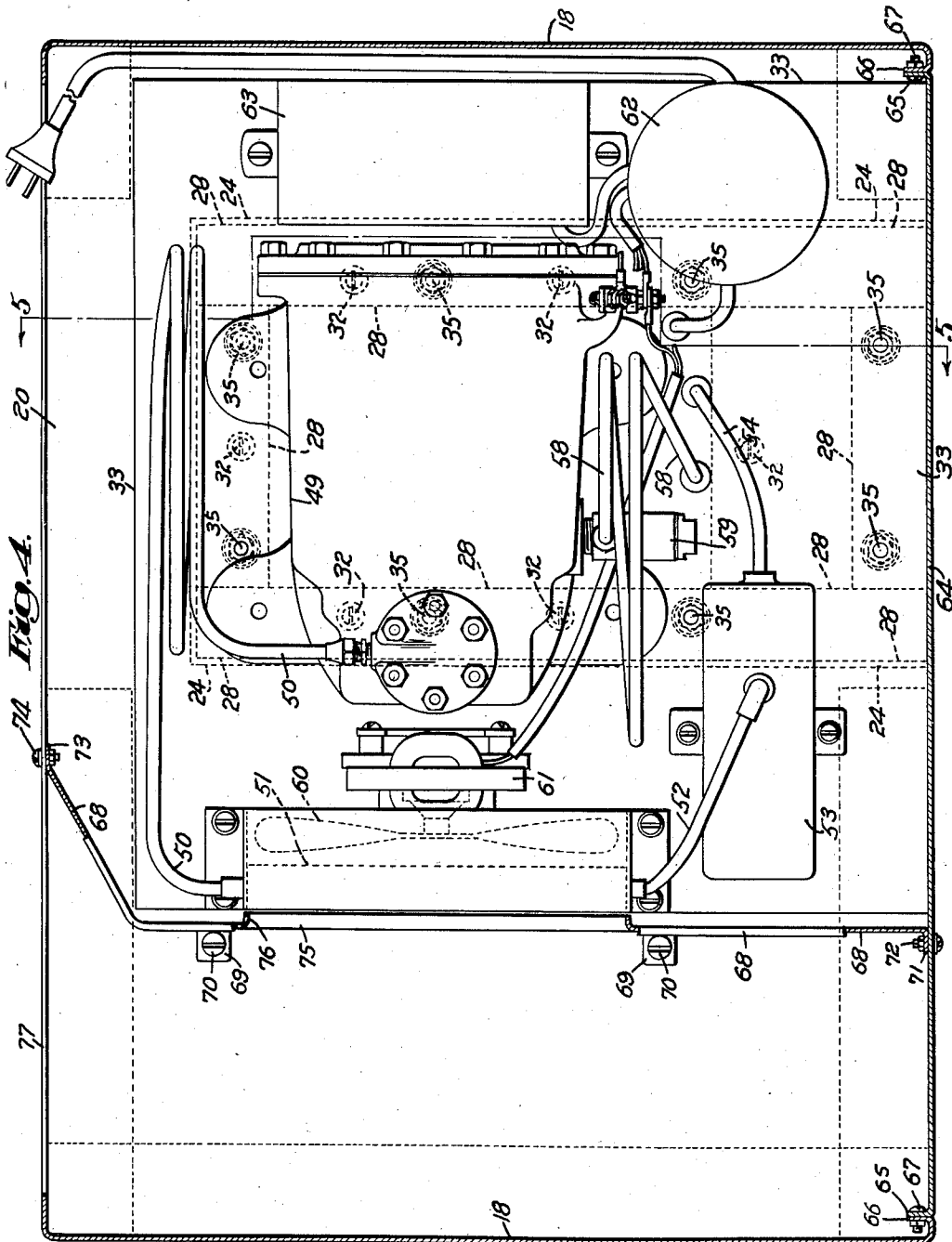
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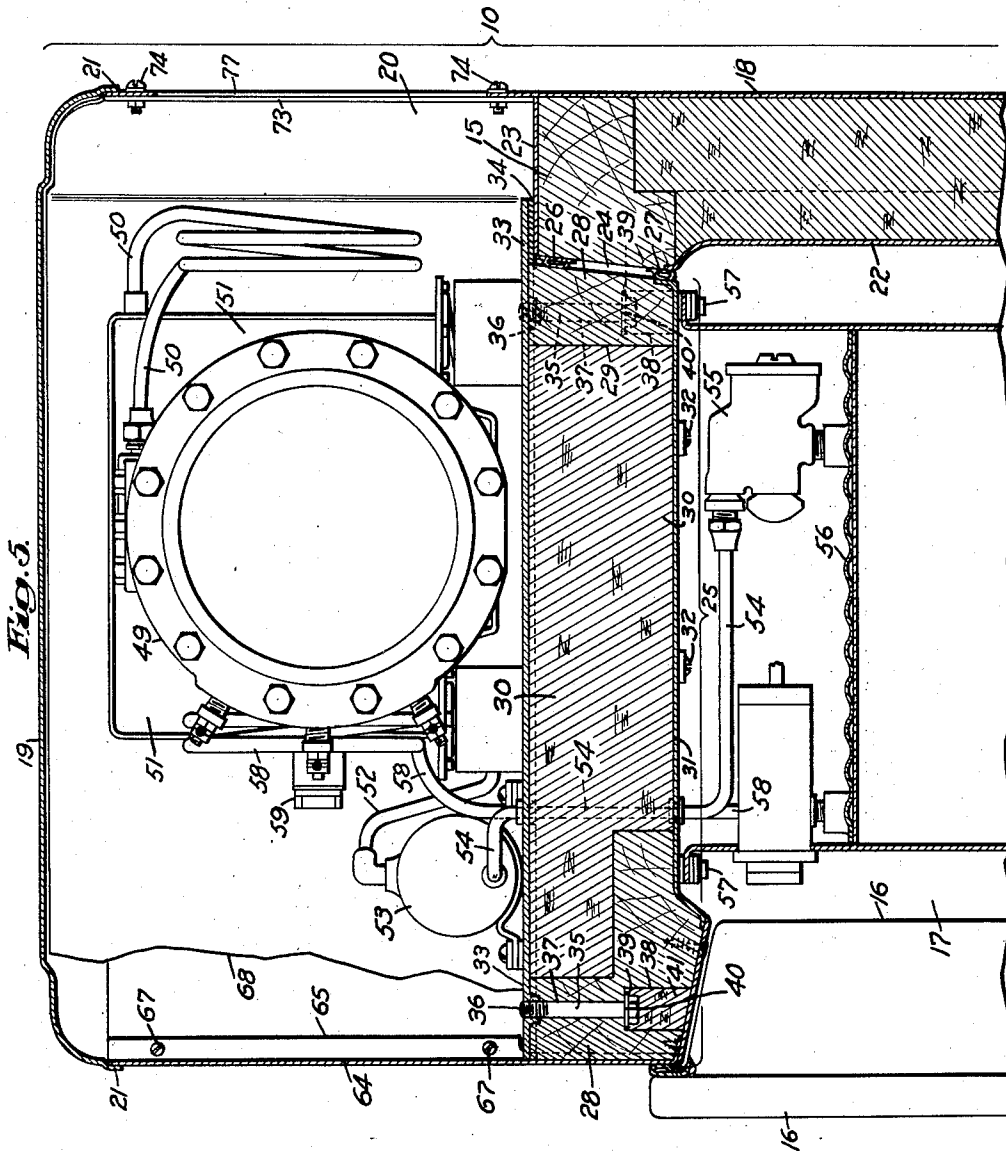
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5 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE

1,992,298

REFRIGERATOR

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Application October 3, 1932, Serial No. 635,914

2 Claims. (Cl. 62—116)

This invention relates to refrigerating machines of the "compressor-condenser-expander circuit" refrigerator type, and is more especially concerned with improvements relating to the construction, arrangement and mounting, of a mechanical refrigerating unit with respect to a cabinet having a food storage space in which the expander of the unit is received.

The invention will best be understood by reference to the following description of two specific embodiments thereof, while its scope will be pointed out more particularly in the appended claims.

In the drawings:

Fig. 1 is a plan, partly in horizontal section, of a refrigerating machine embodying the invention;

Fig. 2 is a vertical, sectional view on irregular line 2—2 of Fig. 1;

Fig. 3 is a vertical, sectional view on irregular line 3—3 of Fig. 1;

Fig. 4 is a plan, partly in horizontal section, of a modification of the invention; and

Fig. 5 is a vertical, sectional view on irregular line 5—5 of Fig. 4.

Referring to the drawings, and to the embodiments of the invention illustrated therein, each comprises a cabinet 10 (see Fig. 2), having thick, insulated side walls 11 and 12, front and back walls 13 and 14 (see Fig. 3), a top wall 15 (see Fig. 2), and an insulated door 16 (see Fig. 3), and forming together a storage space or food compartment 17. A metallic shell 18 about the side and the front and back walls extends upwardly beyond the top wall and, together with an upwardly removable cover 19, forms a machinery chamber 20 to which access may be had by lifting the cover, the latter being provided with a downwardly directed flange 21, which snugly fits about the sides of the shell 18. The storage compartment has an internal shell or lining 22 on the inner faces of the walls, and the upper face of the top wall is covered by a metallic plate 23.

In each form, the top wall is provided with an aperture 24, extending from the storage space into the machinery chamber and closed by a closure 25 which is received in said aperture. In the form shown in Figs. 1, 2 and 3, it is intended that the closure shall be removable upwardly, and the aperture has four sides formed in the top wall, whereas in the form shown in Figs. 4 and 5 it is intended that the closure shall be removable horizontally in a forward direction, and the aperture extends through the front

wall of the cabinet above the door 16, and the latter must be opened to permit the forward displacement of the closure. In each form, the aperture is tapered, that is to say, it has outwardly diverging sides, and the closure is correspondingly tapered. Upper and lower compressible gaskets 26 and 27, between the sides of the closure and the sides of the aperture, in the present example, are secured to the sides of the latter to provide a tight joint, and to prevent the entrance of warm air into the storage compartment 17.

As herein shown, in each form the closure 25 has a marginal frame 28 and a chamber 29 bounded by said frame, and filled with appropriate insulating material 30. An inner plate 31 closes the chamber 29 at the inside, and is suitably secured to the marginal frame of the closure, as by screws 32. The chamber 29 is closed at the top by a base plate 33, which overlies the top wall 15 about the aperture 24, and rests upon a gasket 34, whose area is coextensive with that of the base plate, said gasket being made of appropriate material, such as medium hard rubber, capable of being slightly compressed by the weight of the unit, and thus furnishing an additional means to prevent the entrance of warm air into the storage compartment 17. The base plate 33 is secured to the marginal frame 28 of the closure 25 by suitable means, herein a plurality of cap screws 35 threaded into the base plate, as at 36. Each cap screw is received in a hole 37, having a countersunk portion 38 and an abutment 39 for a washer 40 carried by the cap screw, and to prevent the conduction of heat from the base plate through these cap screws to the storage space, the space in the countersunk portion 38 between the head of the cap screw and the inner plate 31 is filled by a body of suitable insulating material 41.

The closure and the base plate as thus constituted provide a support for a unitary refrigerating unit, which will now be described, reference being had at first to Fig. 2. Surmounting the base plate is a motor compressor unit 42, comprising an electric motor 43, including a stator 44 and a rotor 45, the latter being connected to and driving a compressor 46, including a piston 47 working in a cylinder 48. The motor and the compressor are housed in a single housing 49.

The outlet of the compressor is connected by a pipe 50 (see Fig. 1) to the inlet of a condenser 51, which is mounted upon the base plate, and the outlet of the condenser is connected by a

pipe 52 to a liquid refrigerant receiver 53, also mounted upon the base plate. Leading from the outlet of this receiver is a pipe 54, which extends downwardly through the base plate and through the closure 25 to the storage chamber 17, where it is connected to an expansion valve 55, and the latter in turn is connected to an appropriate expander 56. The expander is suitably supported by the closure 25, as by lag screws 57 inserted upwardly into the marginal frame 28 of the closure. A pipe 58, leading from the outlet of the expander, extends upwardly through the closure 25 to an intake plug 59, which communicates with the intake of the compressor 46.

The base plate also affords support for other usual accessories, including a condenser cooling fan 60 driven by a motor 61, a relay switch 62 and a motor condenser 63, the latter being associated with the compressor driving motor 43 in a well-known manner, to take care of the starting load.

It should, of course, be understood that the described unit, including the motor driven compressor, condenser, the expander, the pipe connections and the various accessories, is merely typical and illustrative of the general arrangement of the machine parts of a compressor-condenser-expander circuit. In the case of the form of the invention shown in Figs. 1, 2 and 3, the described unit may be inserted and removed vertically. In the case of the form shown in Figs. 4 and 5, the unit is inserted and removed horizontally, after opening the door of the cabinet. The construction disclosed in Figs. 4 and 5, however, involves the use of a front plate 64, which is separate from the cabinet shell 18, and is conveniently secured to and movable with the removable closure 25. As shown in Fig. 4, this front plate is provided with turned, vertical flanges 65, engaging like intumed flanges 66 on the shell 18 and secured thereto as by bolts 67, which should be removed before the unit is to be removed from the cabinet.

Each form of the invention, as herein shown, is characterized by the use of a baffle 68 to control the flow of air from the exterior of the cabinet through the condenser to the fan, and thence about the compressor to the exterior of the cabinet again, without loss of efficiency through eddy currents and short-circuiting. This baffle is conveniently secured to the upper wall 15 of the cabinet, as by providing the baffle with one or more, herein two lugs 69, secured in place by screws 70. The baffle is further secured in place, as by being provided at its front edge with a flange 71, fastened by bolts 72. In the case of the form shown in Figs. 1, 2 and 3, these bolts secure the flange to the

fixed front of the shell 18, whereas in the case of the form shown in Figs. 4 and 5, the bolts secure the flange to the movable front plate 64, and in this case the bolts must be removed before the unit can be displaced forwardly. At the rear, the baffle is provided with a flange 73, fastened by upper and lower bolts 74 to the rear wall of the shell 18.

The baffle (as shown, for example, in Fig. 1) is provided with an aperture 75, having a marginal flange 76, and this aperture is substantially coextensive with the condenser 51, as a result of which the air current induced by the fan 60 flows from the exterior through an opening 77 in the rear wall of the shell 18, through the aperture 75 in the baffle, through the condenser to the fan, about the compressor and outwardly through that portion of the opening 77 which is at the right-hand side of the baffle, as viewed in plan in Figs. 1 and 4.

Having thus described two embodiments of the invention, but without limiting myself thereto, what I claim and desire, by Letters Patent, to secure is:—

1. A refrigerator comprising, in combination, a cabinet having a storage compartment and a machinery compartment thereabove with a horizontal wall therebetween and having an aperture from one compartment to the other, said aperture extending horizontally to one side of said cabinet, a closure received within and fitting three sides of said aperture, a door overlapping the fourth side of said closure, a vertical plate engaging the fourth side of said closure and covering that side of said machinery compartment, an expander within said storage compartment and supported by said closure, and a compressor and a condenser superimposed upon said closure within said machinery compartment and connected in circuit with said expander.

2. A refrigerator comprising, in combination, a cabinet having a storage compartment and a machinery compartment thereabove with a horizontal wall therebetween and having an aperture from one compartment to the other, said aperture extending horizontally to one side of said cabinet, a closure received within and fitting three sides of said aperture, a door overlapping the fourth side of said closure, a vertical plate engaging and carried by the fourth side of said closure and covering that side of said machinery compartment, an expander within said storage compartment and supported by said closure, and a compressor and a condenser superimposed upon said closure within said machinery compartment and connected in circuit with said expander.

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