May 5, 1953 J. A. GALAZZI ET AL 2,637,178

REFRIGERATED STORAGE, DISPENSING, AND DISPLAY CABINETS

Filed March 17, 1949 5 Sheets-Sheet 1

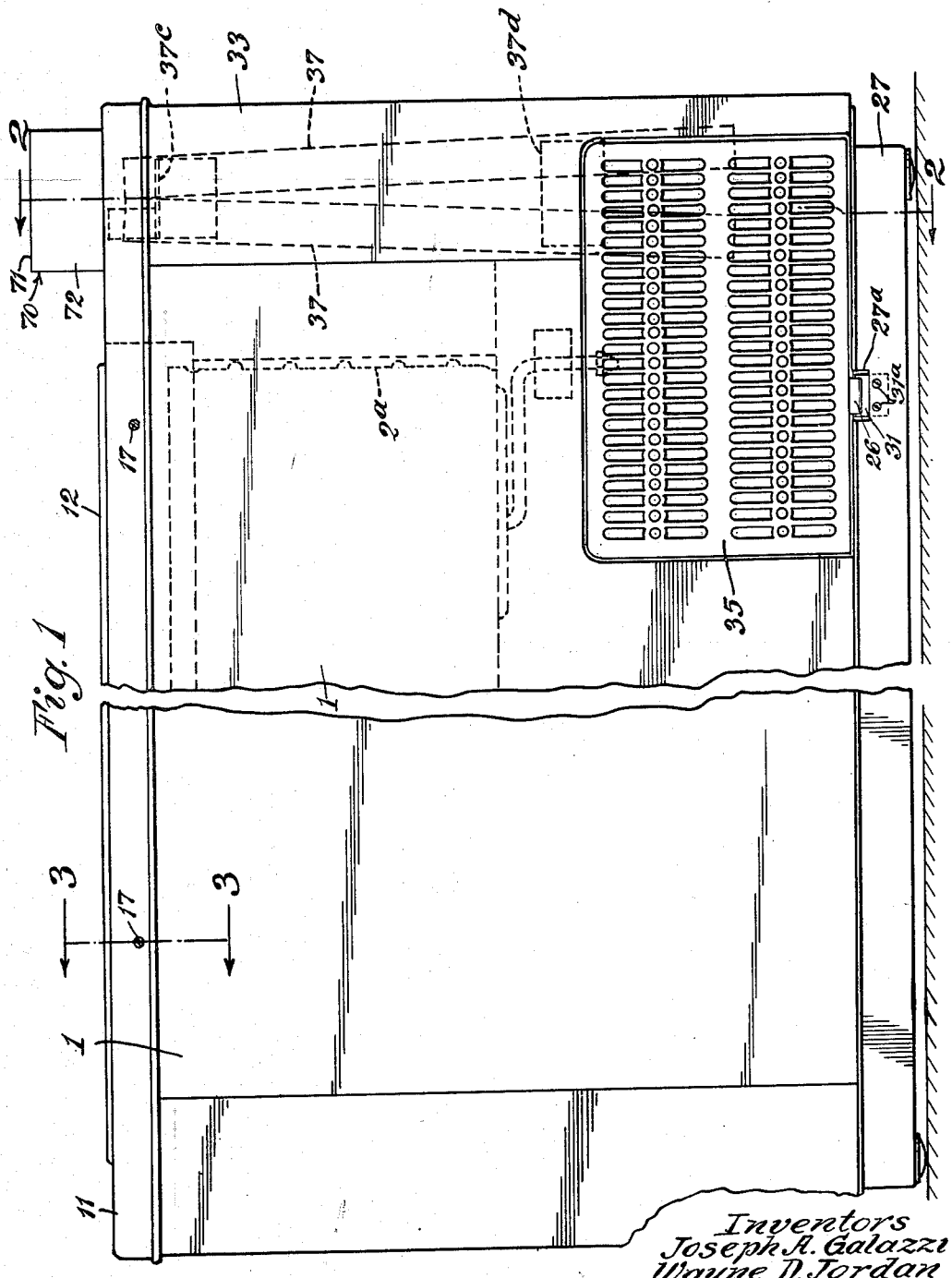


Fig. 1

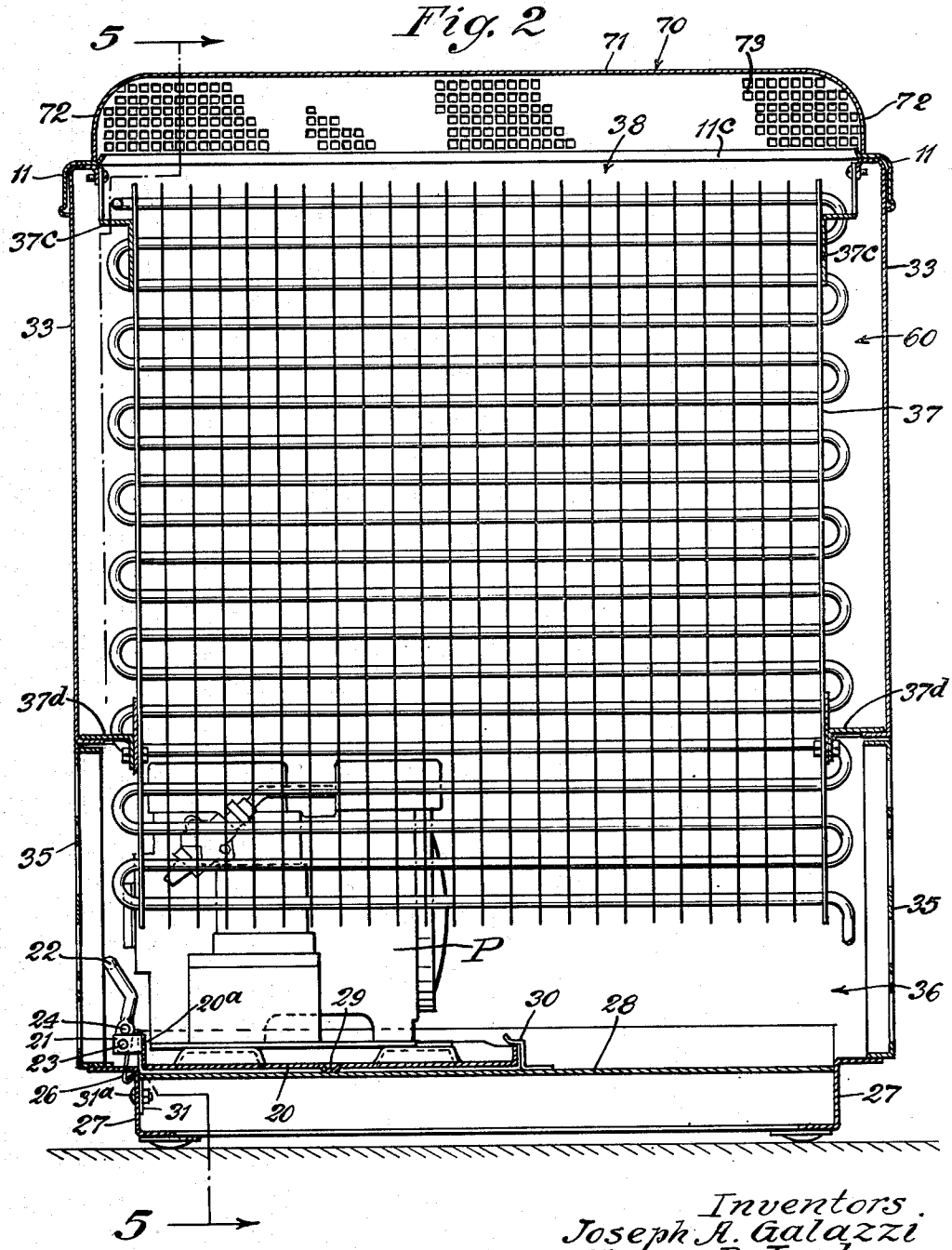
Inventors
Joseph A. Galazzi
Wayne D. Jordan
Paul D. Van Vliet
by Parker & Carter
Attorneys

May 5, 1953 J. A. GALAZZI ET AL 2,637,178

REFRIGERATED STORAGE, DISPENSING, AND DISPLAY CABINETS

Filed March 17, 1949 5 Sheets-Sheet 2

Fig. 2



Inventors.
Joseph A. Galazzi
Wayne D. Jordan
Paul D. Van Vliet
by Parker Harter
Attorneys.

May 5, 1953 J. A. GALAZZI ET AL 2,637,178

REFRIGERATED STORAGE, DISPENSING, AND DISPLAY CABINETS

Filed March 17, 1949 5 Sheets-Sheet 3

Fig. 3

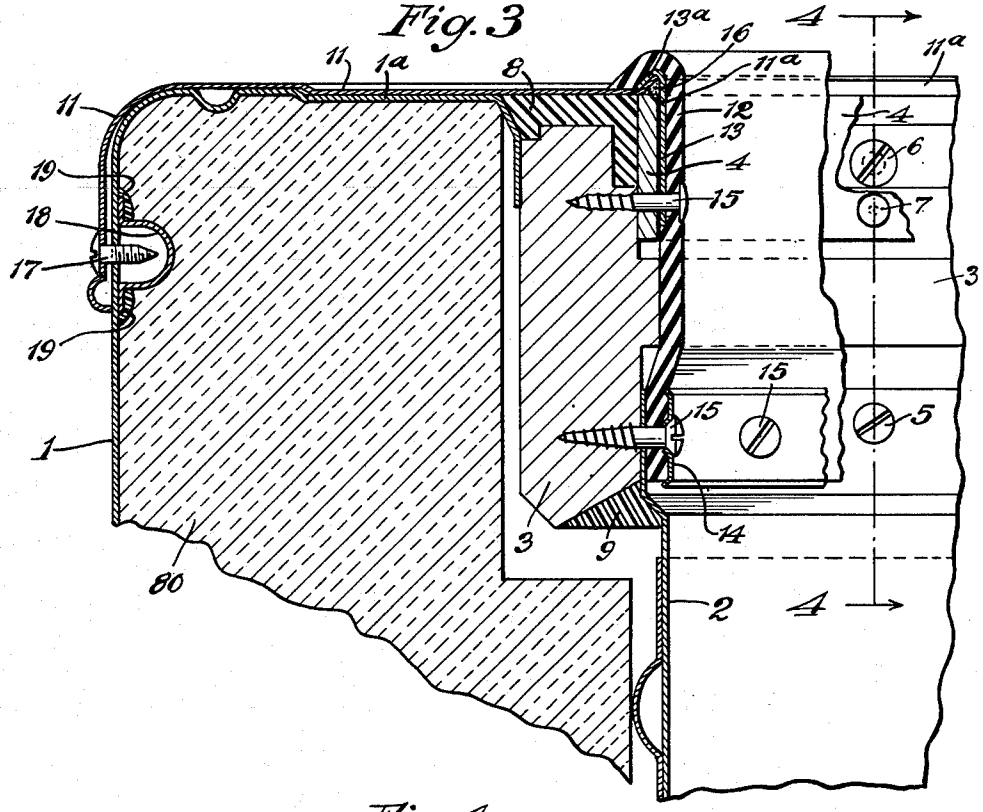
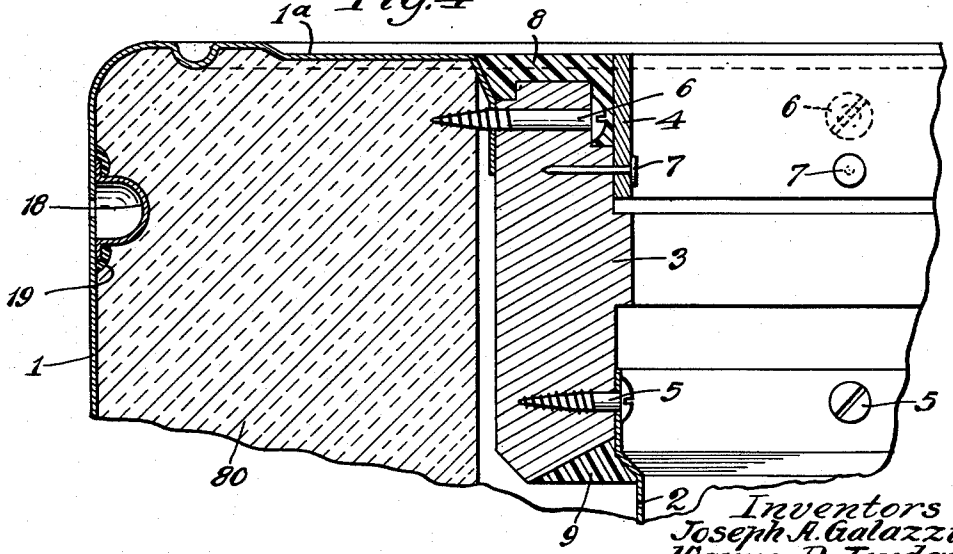


Fig. 4



Inventors
Joseph A. Galazzi
Wayne D. Jordan
Paul D. Van Vliet
by Parker & Carter
Attorneys

May 5, 1953 J. A. GALAZZI ET AL 2,637,178

REFRIGERATED STORAGE, DISPENSING, AND DISPLAY CABINETS

Filed March 17, 1949 5 Sheets-Sheet 4

Fig. 5

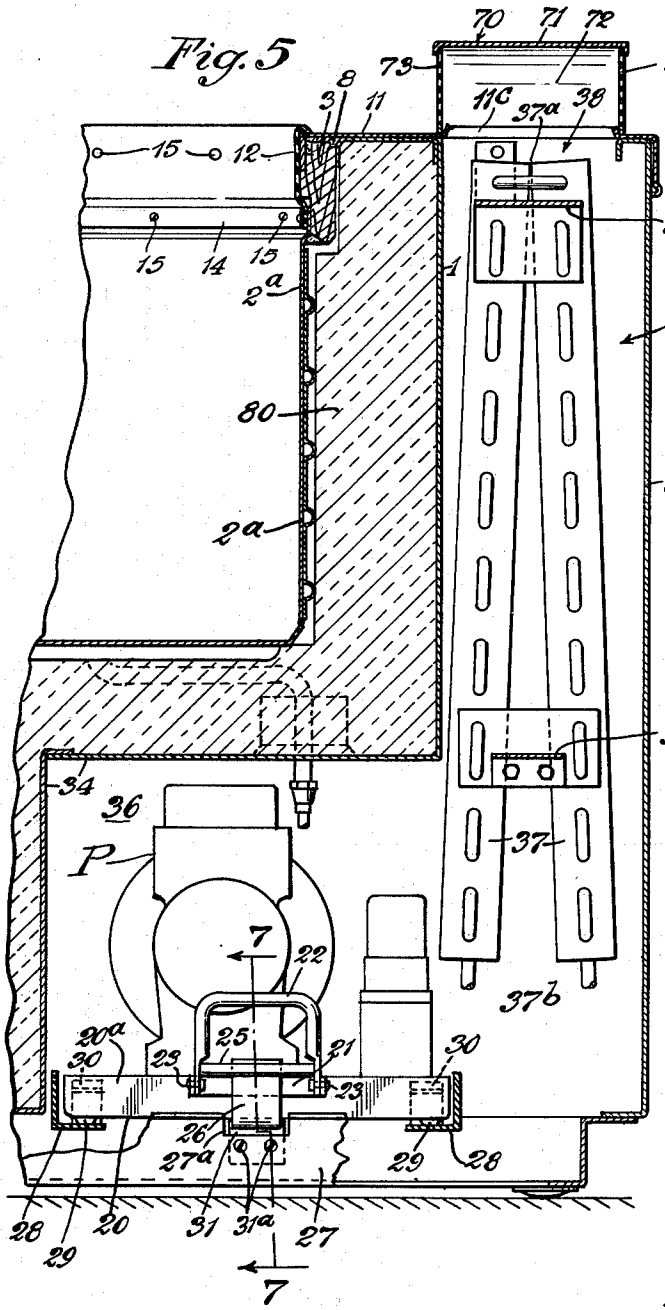
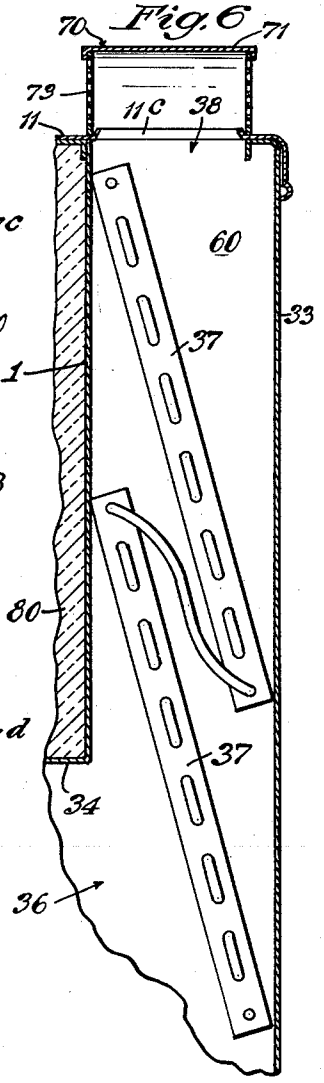


Fig. 6



Inventors
Joseph A. Galazzi
Wayne D. Jordan
Paul D. Van Vliet

by Parker & Carter
Attorneys

May 5, 1953 J. A. GALAZZI ET AL 2,637,178

REFRIGERATED STORAGE, DISPENSING, AND DISPLAY CABINETS

Filed March 17, 1949 5 Sheets-Sheet 5

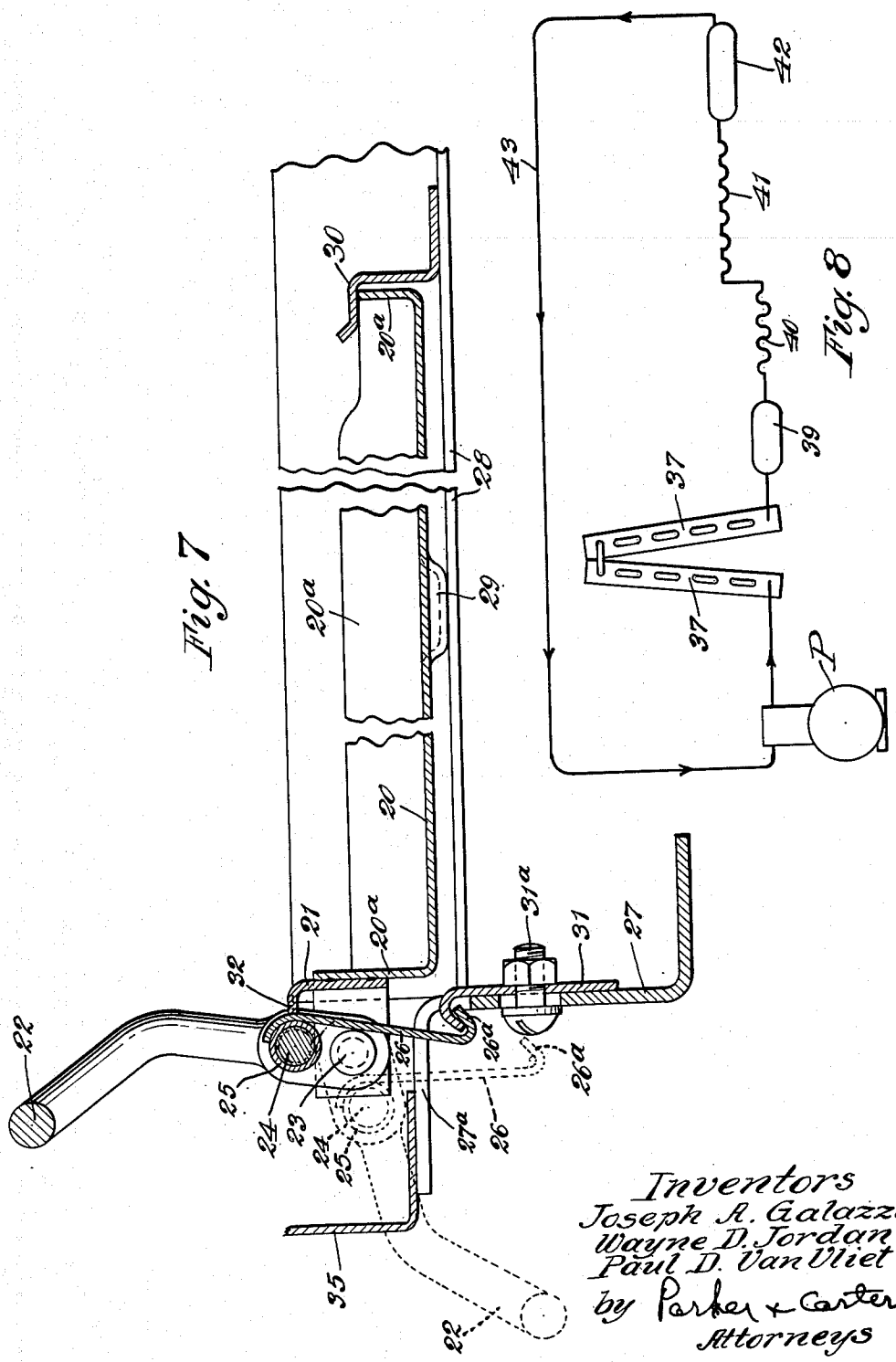


Fig. 8

Fig. 7

Inventors
Joseph A. Galazzi
Wayne D. Jordan
Paul D. Van Vliet
by Parker & Carter
Attorneys

Patented May 5, 1953 2,637,178

UNITED STATES PATENT OFFICE

2,637,178

REFRIGERATED STORAGE, DISPENSING, AND DISPLAY CABINET

Joseph A. Galazzi, Morrison, Wayne D. Jordan, Chicago, and Paul D. Van Vliet, River Forest, Ill., assignors to Liquid Carbonic Corporation, Chicago, Ill., a corporation of Delaware

Application March 17, 1949, Serial No. 81,976

13 Claims. (Cl. 62—117.4)

1

This invention relates to improvements in refrigerated storage, dispensing and display cabinets of the type commonly used for ice cream, frozen foods, bottle beverages, and the like, and having a flat working top pierced by one or more holes giving access to the refrigerated storage space.

One object is to provide an improved construction whereby the insulant packed space between the outer shell and the sleeves is better sealed against vapor entry from outside or from the sleeve.

Another purpose is to provide an improved means of locking the condensing unit in working position for safety when the cabinet is moved, and also with an avoidance of rattle.

Another purpose is to provide an improved and simplified condensing means, whereby service calls are minimized.

Another purpose is to utilize convection to cause air movement through the refrigerant condenser, thus eliminating the customary fan and motor.

Another purpose is to provide a vertical duct inside the cabinet walls with an outlet in the top working surface, to increase the head for maximum airflow through the condenser.

Another purpose is to provide two or more finned condenser units within the duct, so disposed as to make efficient use of the necessarily restricted duct area.

Another purpose is to provide adequate protection of the duct outlet in the top working surface from the entry of water or dirt, without reducing air flow upwardly through the duct.

Another purpose is to prevent unintended closure of the air duct outlet by towels or goods placed over the duct opening in the top working surface.

Another purpose is to permit the retention of the full top area as working space.

Other purposes will appear from time to time in the course of the specification and claims.

The invention is illustrated more or less diagrammatically in the accompanying drawings, wherein:

Fig. 1 is a side elevation illustrating opposite ends of the device;

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

Fig. 3 is a section on an enlarged scale on the line 3—3 of Fig. 1;

2

Fig. 4 is a section on the line 4—4 of Fig. 3 with the liner and cover omitted;

Fig. 5 is a section on the line 5—5 of Fig. 2;

Fig. 6 is a partial section illustrating a variant arrangement of the condenser coils in the vertical air duct of Fig. 5;

Fig. 7 is a section on the line 7—7 of Fig. 5; and

Fig. 8 is a schematic cycle diagram.

Like parts are indicated by like symbols throughout the specification and drawings.

Referring to the drawings and, for example, to Fig. 3, 1 is the outer steel cabinet shell formed to provide a flat top surface 1a around all sides of the cabinet. This flat top will be evidenced, for example, in Fig. 4. 2 is the steel sleeve or container in which goods are stored. 3 is a wood member acting as a mechanical support between the shell 1 and the sleeve 2, with low heat-conducting characteristics. 4 is a thin strip of fibre or similar low heat-conducting material. 5 and 6 are screws and, in Fig. 4, 7 is a nail which holds the members 1, 2, 3 and 4 rigidly together. It will be understood that this construction is carried around all four sides of the cabinet, and between the sleeves 2, of which there may be two or more. To seal against vapor, it is advantageous to pour hot tar 8 in the recess above the wood member 3, and additional hot tar 9 in the recess at the bottom of the wood member 3. When completed, the top flange of the shell 1, the top of the fibre strip 4, and the top of the poured tar 8 are all at the same level, providing a flat surface to support the capping 11, which is shown in Fig. 3.

The above described structure provides not only a positive vapor seal between sleeve and shell, but simplifies the structure materially, in that no separate steel subtop is required. The subtop is replaced by folding over the shell wall 1, as at 1a, to form a flat top surface up to the wood surrounding the openings in which the sleeves 2 are positioned.

The construction is completed by applying a stainless steel top 11, as shown in Fig. 3, but omitted from Fig. 4, with edges around each hole turned up at approximately 45°, as shown at 11a in Fig. 3. 12 is a rubber breaker strip, reinforced by a metal strip 13 which is vulcanized to the rubber and has a downwardly and outwardly

turned hook portion 13a formed in its upper edge. 14 is a metal moulding secured in position by the screws 15. A seal is needed to prevent water and vapor from getting under the breaker strip 4 where the up-turned edge 11a of the top 11 and the downwardly extending hook or flange 13a of the metal reinforcement 13 meet. This seal is provided by filling the V-shaped groove of the member 13 with a suitable mastic 16 before applying the top 11. The breaker strip is then pressed down and the screws 15 are sunk or tightened while the pressure continues.

Since it is necessary to screw the stainless top 11 to the shell at close intervals, and since the screws used, 17, may become loose or be lost, it is found advantageous to apply cups 18 at all screw-fastening points, the cups being welded to the inside of the shell 1 and being sealed around their edges with hot tar 19. Thus, when the cover or capping 11 is applied, and the screws 17 inserted, the vapor seal remains unbroken.

A condensing unit is illustrated, which is shown as including a refrigerant pump or compressor P, a motor and relay, not shown, the condensing unit being mounted on a steel base 20, as shown, for example, in Figs. 2, 5 and 7. The base 20 is flanged on four sides, as at 20a and rests upon suitable side rails 28.

For ease of servicing the condensing unit, the pump, motor and starting relay may all be mounted on the steel base or pan which may be pulled forward from operating position, along the rails 28, or which may be locked tightly to prevent vibration or shifting when the cabinet is moved to another location. In conventional units, the customary hold-down bolts are often left out after servicing, with resultant vibration or damage if the cabinet is moved. In the present structure, the locking is automatic and a mechanic cannot apply the protecting grille 35 without operating the locking means.

Referring to Figs. 2, 5 and 7, the condensing unit pan 20 rests on the tracks or side angle supports 28 which are welded to the steel cabinet base 27 at front and back. A downward projection 29 is formed in the pan 20, half-way back on each side. Stops 30 are fastened to the side supports or tracks 28 at the rear of the pan 20, and limit both backward and upward movement of the rear of the pan 20. Any downward pressure on the front edge of the pan 20, as will be clear from Fig. 7, will than lock the pan 20 tight to the supporting angles or tracks 28, with predetermined pressure points at the front, on the side projections 29, and at the back under the stops 30.

A U-shaped bracket 21 is shown as welded to the front flange of the pan 20. A handle 22 is mounted between the ears of the bracket 21 by shoulder rivets 23 so that the handle 22 may be freely swung. A rod 24 is staked into the handle, carrying a tube 25, free to move on the rod, and a strap member 26 is welded to the tube 25 and is formed into a hook 26a at its lower edge or end. This structure will be clear, for example, from Fig. 7. The cabinet base 27 has its upper flange cut away as at 27a in Fig. 5, to permit the hooked member 26 to swing downward, and to permit the hooked end of the lug 31 to extend through the notch 27a to the outside, for engagement with the hook 26a of the member 26. The lug 31 is shown as fastened to the base by screws 31a, and is adjustable in height.

In Fig. 7, the base 20 is shown as pushed into operating position, ready for locking. The handle is shown in dotted line in the unlocked position, and is shown in full line in the locking position. By lifting the handle 22 from the dotted line to the full line position of Fig. 7, the hook 26a engages with the hook of the lug 31, exerting downward pressure on the pan 20 and locking it into position. At the center of the bracket 21, an upward extension 32 is bent forward to act as a stop to limit the movement of the handle 22. In the full line position of Fig. 7, with the hooked member 26 in the locking position and also against the stop 32, the system is locked, as the center of the rod 24 has passed a straight line drawn through the center of rotation of the handle 22 and the engaging point of the hooks of the members 26 and 31. In other words, when the handle 22 is pushed as far as the stop 32 will permit, the rod 24 has been moved over center and the parts are automatically held in locked position. Should a serviceman fail to move the handle 22 to the upright position and thus lock the base 20 in position, the handle 22 would project forward in a position to prevent the application of the air inlet grille 35, shown in Figure 1.

This construction provides easy access to the condensing unit, makes it certain that the serviceman will lock the pan securely to the supports before leaving, insures freedom from vibration between pan and supports, and accomplishes these purposes while using no lose parts that might be omitted or lost.

To cut down the frequency and cost of service, it has been the practice in the domestic refrigeration field to use the so-called static condenser of large surface, instead of the more compact condenser of smaller surface, with motor and fan to activate air flow. With a relatively tall cabinet, an enclosure at the rear gives an excellent chimney effect, and the condenser may be within the chimney, or a plate condenser may form three walls of the chimney or duct, or a condenser may be placed near the floor within the pump-motor compartment with an outlet to the chimney. These are current practices. In considering the usual cabinet of the type described, with its 33" to 36" overall height, and the increased heat to be dissipated, the problem is more difficult. The cabinet is also frequently placed against a wall and between other equipment, so that air entry to and exit from the cabinet are limited to its front and top.

In the present invention, a duct is formed within the cabinet walls, for example, at one end, rising from the ceiling of the pump-motor compartment, and with an air outlet through the top. Within the limitations of a maximum 6" width of duct permitted by cabinet size standardization in the ice cream cabinet field, the length of duct limited by the front to rear dimension of the standard cabinet, and with height also limited, and with the requirement of 72 to 80 square feet of condenser surface to be located within the duct and with fins widely spaced to cut down convection head loss, it has, nevertheless, been possible to develop a design that equals in performance the conventional condenser-motor-fan system, with all the advantages of the domestic refrigerator with static condenser and tall chimney.

In the system, as shown in Fig. 5, the cabinet shell 1 in the zone of the condensing unit compartment extends downwardly to the ceiling of the pump-motor compartment 36, and the ceiling and end wall 34 define the pump-motor com-

partment. The compartment is open at front and back, and is partially closed by two grilles **35**, of which one is illustrated in Fig. 1 and both are illustrated in Fig. 2. The duct **60** has walls **33** with an exit opening **38** at the top. The stainless steel top **11** extends past the duct, but has an opening corresponding to the duct opening **38**. The edges of the top **11** are turned up around the duct opening, as at **11***c* in Figs. 5 and 6, to prevent water lying on the top from entering the duct. Within the duct and extending downwardly toward or into the pump-motor compartment are two condensers **37**, their upper edges touching, as at **37***a*, and their lower edges separated, as at **37***b*. Any suitable support means, not shown in detail, are provided at the top of the duct, as at **37***c*, and at the ceiling height of the pump-motor compartment, as at **37***d*, whereby the condenser may be properly held in position. It will be understood that the front to back width of the condenser and return tube bends is slightly less than the front to back dimension of the duct opening **38**, permitting ready removal from above. This is clear from Fig. 2.

Air enters between the condensers at the bottom, as at **37***b*, and through the V-shaped openings at front and back within the pump-motor compartment and passes upwardly and outwardly through the fins to the exit opening at the top. With the fins spaced roughly two and one-half to the inch, the top opening is not noticeably restricted by the presence of the condensers within the opening. Heated air from the pump-motor compartment **36** is free to enter the duct through the adjacent condenser face, or may bypass the condenser **37** if the left condenser is spaced slightly away from the duct wall so that air from the pump may enter the duct directly.

The refrigerant circuit is diagrammatically shown in Fig. 8. It will be understood that hot compressed refrigerant leaves the pump P, passes upwardly through the first condenser **37**, downwardly through the second condenser **37**, through a receiver **39**, as a liquid, has its pressure and temperature reduced in a tubular restrictor **40**, then enters the sleeve evaporator **41**, where it evaporates. It then passes through an accumulator-drier **42** which traps any slugs of liquid refrigerant, and the refrigerant gas then returns to the pump P through the tube **43**.

The exit air opening **38** from the duct **60** must be closed against the entry of water or dirt, but in such a manner as not to restrict air flow. The closure or top must be so constructed as to prevent blocking of the air exit. However, if a grille is used, it represents a loss of top working area. In order to meet the above conditions and restrictions, the closure is designed as below described.

The exit grille is shown as in the form of a box with open bottom, generally indicated as **70**, having a flat top **71** and downwardly curved ends **72**, of solid metal, and sides **73** of perforated metal. This structure, illustrated in Figs. 2, 5 and 6, fits over the duct opening **38** and is fastened in place by any suitable securing means, not shown in detail. The flange **11***c* around the holes in the capping **11** lies within the grille structure **70**, locates it, and prevents water entry. This construction permits the placing of dishes or glasses on top of the grille structure during the making of sundaes or sodas, with the least possible loss of working area, and such placement of dishes does not obstruct the air flow. Water and spilled ice cream cannot enter the duct, and the appearance of the cabinet is enhanced rather than hurt by the grille.

It will be realized that whereas we have described and shown a practical and operative device, nevertheless, many changes may be made in size, shape, number and disposition of parts without departing from the spirit of the invention. The description and drawings will, therefore, be taken as in a broad sense illustrative or diagrammatic, rather than as a limitation to the specific showing herein.

For example, in Fig. 6, we illustrate an alternative arrangement of the condensers **37** in which one is positioned above the other, and both condensers being inclined between and contacting the opposite walls of the duct **60**.

It will be also understood that we may vary the size, shape and number of the sleeves to suit the necessities of a particular installation. However it is, in any event, important to have one of the sleeves, as shown at **2***a* in Fig. 1, of substantially shorter vertical depth than the others, with its top even with the tops of the others. The use of this shallower sleeve provides space for the pump-motor compartment, the relationship of the parts being clear from Fig. 5.

It will be further understood that the space between the outer shell **1** and steel sleeve **2** is filled with suitable insulation **80**.

We claim:

1. In a refrigerated storage, dispensing or display cabinet having at least one opening in the top thereof, an external metal shell with a closed bottom, and having at least one internal metal sleeve spaced from the shell and having a top opening, and heat insulation between each of the sleeves and the shell on the sides and bottom, one end sleeve being shallower than adjacent sleeves, an extension of the shell at the shallow sleeve end, defining a vertical duct, a metal capping extending over the shell and the extension, and having a hole through the capping of a size slightly smaller than and over the duct opening, a pump-motor compartment within the shell and under the shallow sleeve and duct, having one side wall and a ceiling integral with the cabinet shell, a second side wall integral with its shell extension, and communicating with the vertical duct, and having openings through front and rear of the cabinet shell and extension walls, partially closed by grilles admitting air freely, and fin and tube condenser means located within the duct and partly extending downwardly into the pump-motor compartment, said condensing means comprising two units placed face to face with top edges touching and the bottom edges spread apart, providing free air inlet space between condensers at the bottom, to the entire inner faces of both condensers and providing free exit over the entire outer faces of both condensers to the duct and the top opening, and a metal housing fastened over the duct opening, having a flat top to provide top working surface, and perforated metal side walls allowing air to move freely from duct to room.

2. In a refrigerated storage, dispensing or display cabinet having a plurality of top openings, an external metal shell with a closed bottom, and having a plurality of internal metal sleeves spaced from the shell and having top openings, and heat insulation between the sleeves and the shell on the sides and bottom, one end sleeve being shallower than adjacent sleeves, an

extension of the shell at the shallow sleeve end, defining a vertical duct, a metal capping extending over the shell and the extension, and having a hole through the capping of a size slightly smaller than and over the duct opening, an upward turned flange around the opening, a pump-motor compartment within the shell and under the shallow sleeve and duct, having one side wall and a ceiling integral with the cabinet shell, a second side wall integral with its shell extension, and communicating with the vertical duct, and having openings through the front and rear of the cabinet shell and the extension walls, partially closed by grilles admitting air freely, and fin and tube condenser means located within the duct and partly extending downwardly into the pump-motor compartment, said condensing means comprising two units placed face to face with the top edges touching and the bottom edges spread apart, providing free air inlet space between the condensers at the bottom to the entire inner faces of both condensers, and providing free exit over the entire outer faces of both condensers to the duct at the top opening, and on condenser being spaced from the duct wall by a distance permitting heated air from the pump-motor to pass directly into the duct at compartment ceiling height, and a metal housing fastened over the duct opening having a flat top to provide top working surface, and perforated metal side walls allowing air to move freely from duct to room, said housing extending outside the upward turned flanges of the metal capping.

3. In a refrigerated storage, dispensing and display cabinet having a plurality of top openings, an external metal shell with a closed bottom, and having a plurality of internal metal sleeves spaced from the shell and having top openings, and heat insulation between the sleeves and the shell on the sides and bottom, one end sleeve being shallower than adjacent sleeves, an extension of the shell at the shallow sleeve end, defining a vertical duct, a metal capping extending over the shell and extension, and having a hole through the capping of a size slightly smaller than and over the duct opening, and an upward turned flange around the opening, a pump-motor compartment within the shell and under the shallow sleeve and duct, having one side wall and a ceiling integral with the cabinet shell, a second side wall integral with its shell extension, and communicating with the vertical duct, and having openings through the front and rear of the cabinet shell and the extension walls, partially closed by grilles admitting air freely, fin and tube condenser means located within the duct and partly extending downwardly into the pump-motor compartment, said condensing means being placed within the duct with its top edge touching the duct wall adjacent the shallow sleeve and the lower edge touching the duct wall on the opposite side, causing all air entering at the bottom to pass through the condenser, and a metal housing fastened over the duct opening, having a flat top to provide top working surface, and perforated metal side walls allowing air to move freely from duct to room, said housing extending outside the upward turned flanges of the metal capping.

4. In a refrigerated storage, dispensing or display cabinet at least one opening in the top thereof, an external shell with a closed bottom, at least one internal sleeve spaced from the shell and having top openings, and heat insulation between each of the sleeves and the shell on the sides and bottom, one end sleeve being shallower than adjacent sleeves, an extension of the shell at the shallow sleeve end, defining a vertical duct, a metal capping extending over the shell and the extension, and having a hole through the capping of a size slightly smaller than and over the duct opening, a pump-motor compartment within the shell and under the shallow sleeve and duct, having one side wall and a ceiling integral with the cabinet shell, a second side wall integral with its shell extension, and communicating with the vertical duct, and having openings through front and rear of the cabinet shell and the extension walls for admitting air freely, and fin and tube condenser means located within the duct and partly extending downwardly into the pump-motor compartment, and a housing fastened over the duct opening, having a generally horizontal top to provide top working surface, and perforated side walls allowing air to move freely from duct to room, said housing extending upwardly from the metal capping.

5. In a refrigerated storage, dispensing or display cabinet having at least one opening in the top thereof, an external shell with a closed bottom, and internal sleeves spaced from the shell and having top openings, and heat insulation between the sleeves and the shell on the sides and bottom, one end sleeve being shallower than adjacent sleeves, an extension of the shell at the shallow sleeve end, defining a vertical duct, a pump-motor compartment within the shell and under the shallow sleeve and duct, having one side wall and a ceiling integral with the cabinet shell, a second side wall integral with its shell extension, and communicating with the vertical duct, and having openings through the front and rear of the cabinet shell and the extension walls, partially closed by grilles admitting air freely, and fin and tube condenser means located within the duct and partly extending downwardly into the pump-motor compartment, and a housing fastened over the duct opening, having a generally horizontal top to provide top working surface, and perforated side walls allowing air to move freely from duct to room.

6. In a refrigerated cabinet having a top opening, an external metal shell with a closed bottom and having at least one internal metal sleeve spaced from the shell, said sleeve having a top opening, heat insulation between the shell and sleeve, an extension of the shell at one end of the cabinet defining a vertical duct, said shell providing in the lower portion of the cabinet a pump-motor compartment communicating with said duct, said shell being provided with grills aligned with said compartment for admitting air thereto freely, and fin and tube condenser means located within said vertical duct, and a metal housing extending over the duct and having perforated side walls allowing air to move freely outwardly from said duct, a pump and motor drive therefor mounted in said compartment, said pump being connected to said condenser means adjacent the lowermost portion thereof, whereby the cooled fluids are taken from the uppermost portion of said condenser means.

7. In a refrigerated cabinet having a top opening, a shell providing side walls for the cabinet and with one side wall provided with an opening, a removable panel closing said opening, slide rails within said cabinet aligned with said panel,

a metal pan mounted on said slide rails and adapted to support a pump and motor thereon, clamping means secured to said pan and engageable with a portion of said shell for anchoring said pan therein, and a pivoted handle member associated with said clamping means for releasing said clamping means when the handle is drawn forwardly and for engaging said clamping means when the handle is moved upwardly, said panel, when in position, lying in the path of said pivotally-mounted handle to prevent the unclamping of said pan.

8. In a refrigerated cabinet having a top opening, a shell providing side walls for the cabinet and with one side wall provided with an opening, a removable panel closing said opening, slide rails within said cabinet aligned with said panel, a metal pan mounted on said slide rails and adapted to support a pump and motor thereon, clamping means secured to said pan and engageable with a portion of said shell for anchoring said pan therein, and a pivoted handle member associated with said clamping means for releasing said clamping means when the handle is drawn forwardly and for engaging said clamping means when the handle is moved upwardly, said panel, when in position, lying in the path of said pivotally-mounted handle to prevent the unclamping of said pan, said clamping means comprising a U-shaped bracket fastened to the front flange of the pan, having two aligned bearing holes in its legs, and said handle being U-shaped and having flattened ends with holes therein corresponding to the bracket bearing holes, fastening means adapted to attach the handle to the bracket, while permitting free rotation of the handle, and an additional hole in each handle end spaced from the first holes, a rod spanning the handle ends and staked into the bracket holes, a tube surrounding the rod, free to rotate, a strap having one end fastened to the tube and having a hook on the other end, a lug adjustably fastened to the base having a hook on its upper end, said hook in the lug engaging with the hook in the shell strap when the handle is in normal upright closed position, and said hook in the handle being disengaged from the hook in the strap.

9. In a refrigerated storage cabinet having a top opening, a cabinet frame providing bottom and side walls, one of the side walls being provided with a grill-equipped opening, slide rails in the bottom portion of said cabinet, a support for a pump and motor slideably mounted on said rails, a handle pivotally mounted on said slideable support, a clamp eccentrically mounted on said handle and engageable with a hook carried by the lower portion of said frame, whereby when said handle is raised to vertical position, said clamp engages said hook and locks said support rigidly against movement, said grill being removable and when closing said opening, serving to prevent forward movement of said handle to unlocking position, said handle being swingable forwardly, when said grill is removed, to release said clamp from said hook and preventing the insertion of said panel into place to close said opening until said handle is swung again to vertical locking position.

10. In a refrigerated cabinet providing a refrigerated compartment with an access opening in the top thereof, said cabinet having an open-topped vertical duct at one end and a pump-motor compartment in the lower portion thereof communicating with said duct, said cabinet being provided with openings adjacent the lower end of said duct and communicating therewith for admitting air to the duct, a pair of fin-equipped condensers mounted in said duct in substantially spaced relation and being inclined so as to substantially fill said duct, said condensers being connected in series, and a pump and motor in said compartment, said pump being connected to one of said condensers adjacent the bottom of said duct.

11. In a refrigerated cabinet providing a refrigerated compartment with an access opening in the top thereof, said cabinet having an open-topped vertical duct at one end and a pump-motor compartment in the lower portion thereof communicating with said duct, said cabinet being provided with openings adjacent said compartment and the lower end of said duct and communicating therewith, a compressor and a driving motor therefor in said compartment and a pair of fin-equipped condensers spaced apart at one end and touching at the other end to form an inverted V-shape and being mounted in said duct, said compressor being connected by a conduit to one of said condensers adjacent the lower portion thereof, said condensers being interconnected at the upper ends thereof, whereby the hot compressed fluids from said compressor are fed into one of said condensers at the bottom and the cooled fluids are removed from the other of said condensers at the bottom thereof.

12. In a refrigerated cabinet providing a refrigerated compartment with an access opening in the top thereof, said cabinet having an open-topped vertical duct at one end and a pump-motor compartment in the lower portion thereof communicating with said duct, said cabinet being provided with openings adjacent said compartment and the lower end of said duct and communicating therewith for admitting air to the compartment and duct, a compressor and a motor drive therefor mounted in said compartment, a pair of fin-equipped condensers mounted in said duct in spaced-apart and substantially parallel relation and being inclined to substantially fill said duct, said condensers being mounted in said duct so that a portion of one of the condensers extends above the uppermost point of the other condenser, said condensers also being connected in series and the lowermost point on the bottom condenser being connected with said compressor, whereby the hot compressed fluids from said condenser are fed into the lowermost point of said condensers while the cooled fluids are withdrawn at the uppermost point of said condensers.

13. In a refrigerated cabinet having an external shell and a plurality of internal sleeves each having an access opening in the top thereof and being spaced from said shell by insulation, said shell being extended at one end of the cabinet to provide an open-topped vertical duct, the sleeve adjacent said duct being shorter than the others to provide a pump-motor compartment therebelow communicating with said duct, a pump and a motor drive therefor mounted within said compartment, said shell being equipped with openings adjacent said compartment and the bottom portion of said duct and communicating therewith to provide openings for the free passage of air into said compartment and said duct, a pair of series connected condensers mounted in said duct and being inclined with respect to the walls thereof to substantially fill said

duct, the lowermost portion of one of said condensers being coupled with said pump for receiving the hot fluids therefrom.

JOSEPH A. GALAZZI.
WAYNE D. JORDAN.
PAUL D. VAN VLIET.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
Re. 19,964	Scherer	May 19, 1936
696,648	Lambert	Apr. 1, 1902
1,692,792	Munters	Nov. 20, 1928
1,923,899	Williams	Aug. 22, 1933
1,957,955	Hafner	May 8, 1934
2,150,076	Neubauer et al.	Mar. 7, 1939
2,171,621	Burch	Sept. 5, 1939
2,203,439	Oliver	June 4, 1940
2,240,178	Brace	Apr. 29, 1941
2,279,272	Anderson	Apr. 7, 1942
2,414,061	Richard	Jan. 7, 1947
2,442,266	Davis	May 25, 1948
2,462,115	Luecke	Feb. 22, 1949
2,462,279	Passman	Feb. 22, 1949
2,513,631	Erickson	July 4, 1950