April 4, 1950 W. L. MORRISON 2,502,630

VALVED CONNECTION FOR DEMOUNTABLE STRUCTURES

Filed July 20, 1946 4 Sheets-Sheet 1

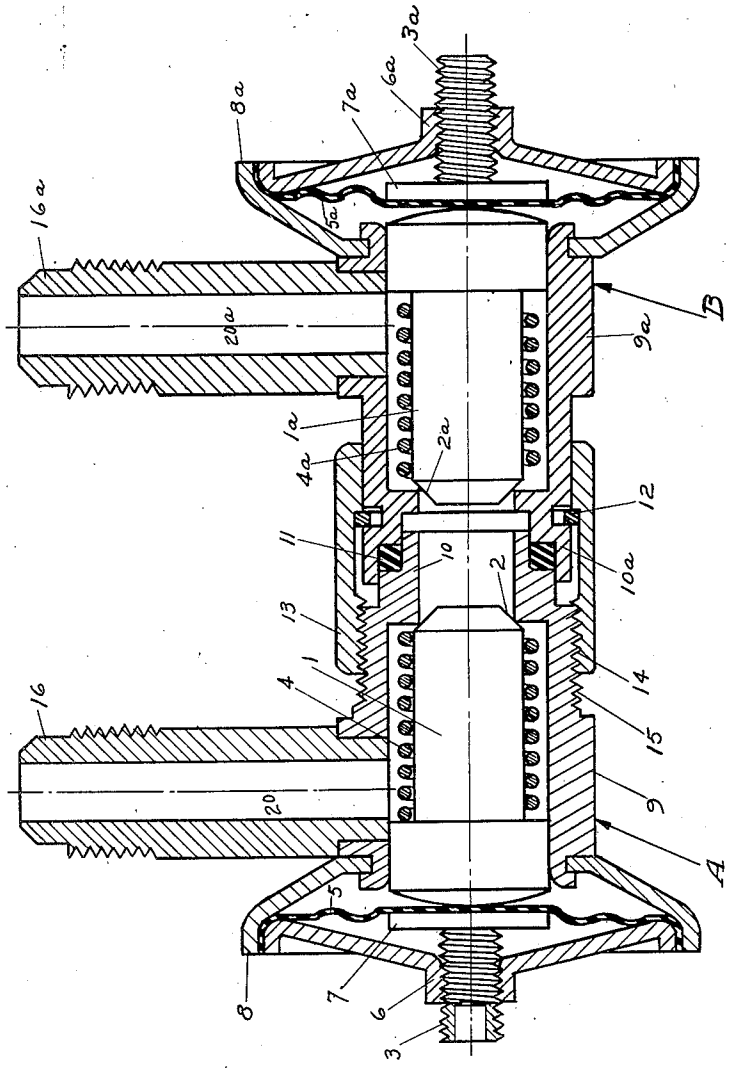


Fig. 1

Inventor
Willard L. Morrison
by Parker Coates
Attorneys

April 4, 1950 W. L. MORRISON 2,502,630

VALVED CONNECTION FOR DEMOUNTABLE STRUCTURES

Filed July 20, 1946 4 Sheets-Sheet 2

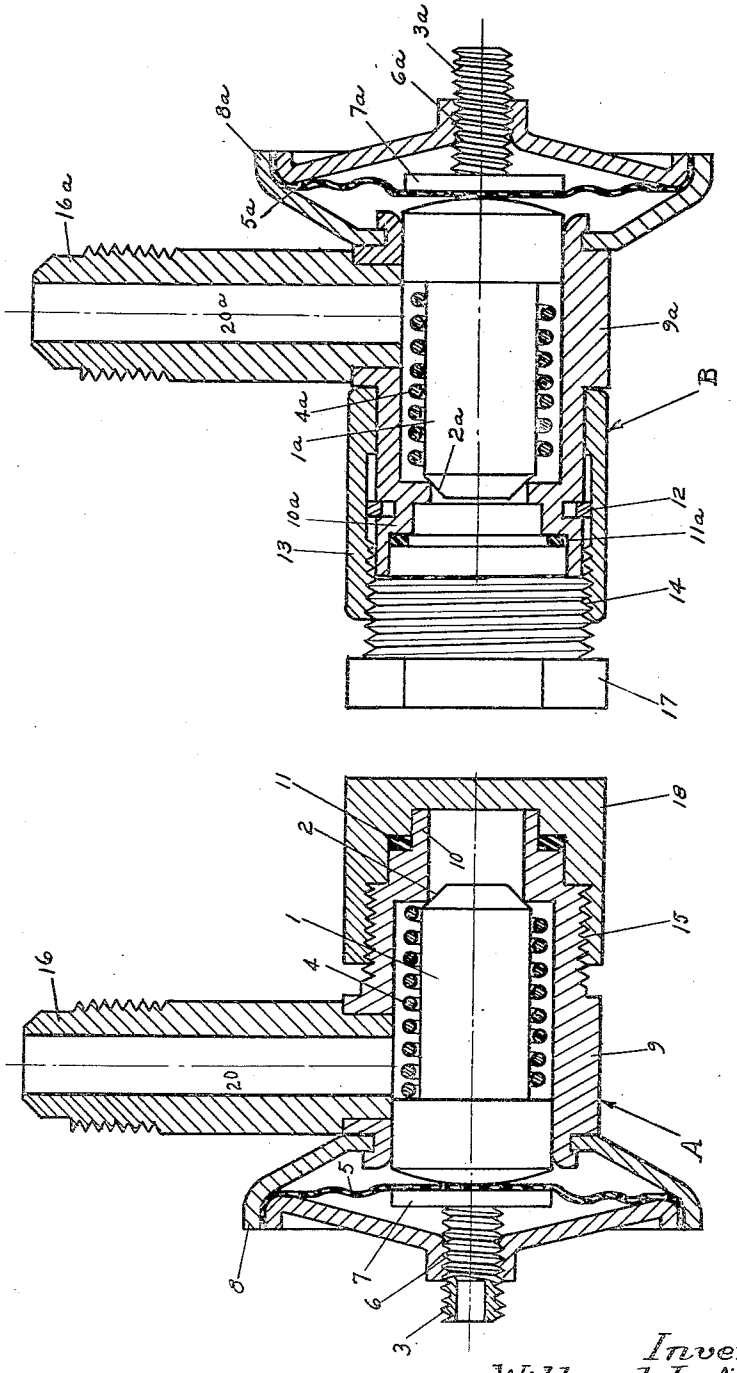


Fig. 2

Inventor
Willard L. Morrison
by Parker & Carter
Attorneys

April 4, 1950 W. L. MORRISON 2,502,630

VALVED CONNECTION FOR DEMOUNTABLE STRUCTURES

Filed July 20, 1946 4 Sheets-Sheet 3

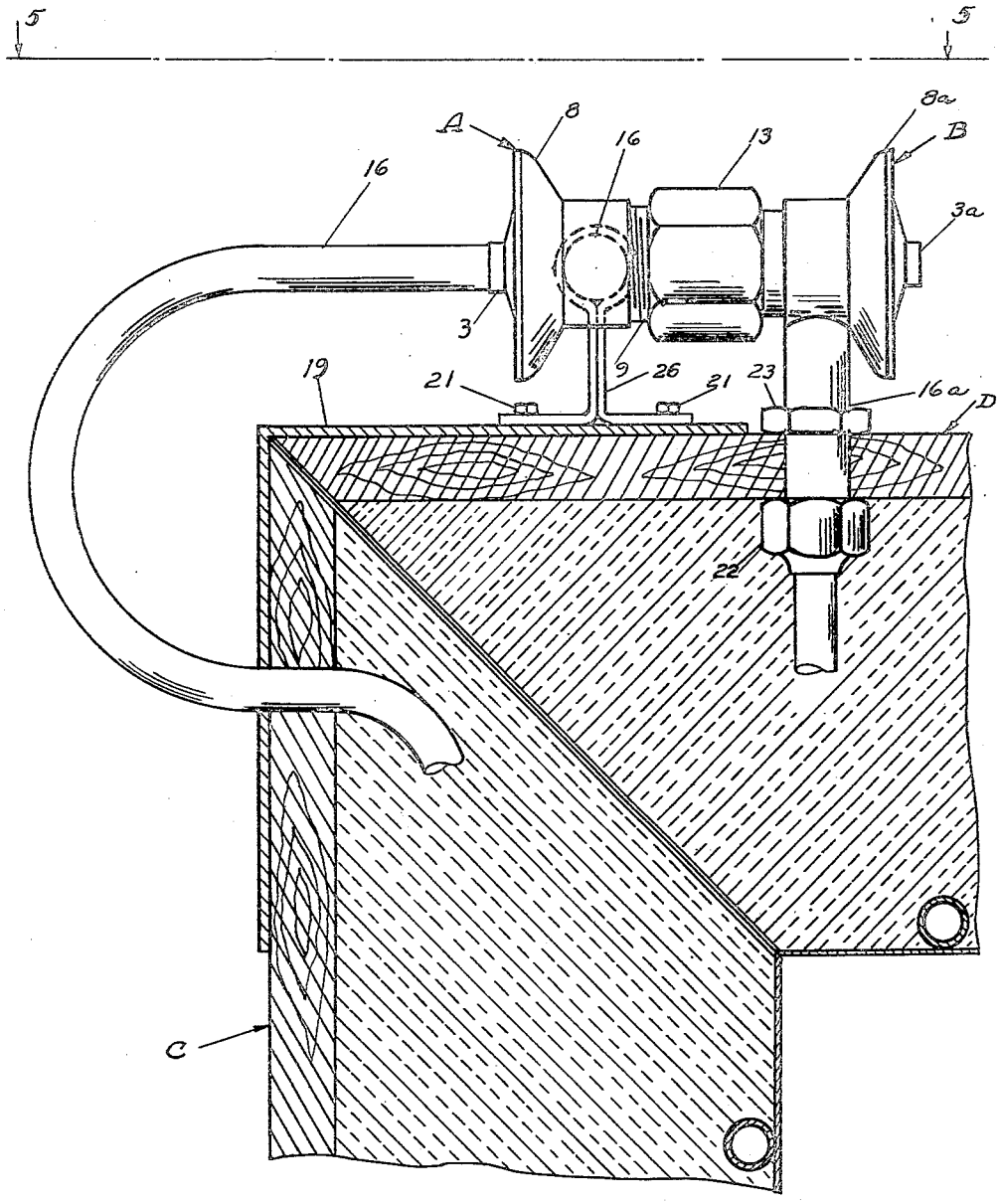


Fig. 3.

Inventor
Willard L. Morrison
by Bailey & Carter
Attorneys

April 4, 1950 W. L. MORRISON 2,502,630

VALVED CONNECTION FOR DEMOUNTABLE STRUCTURES

Filed July 20, 1946 4 Sheets-Sheet 4

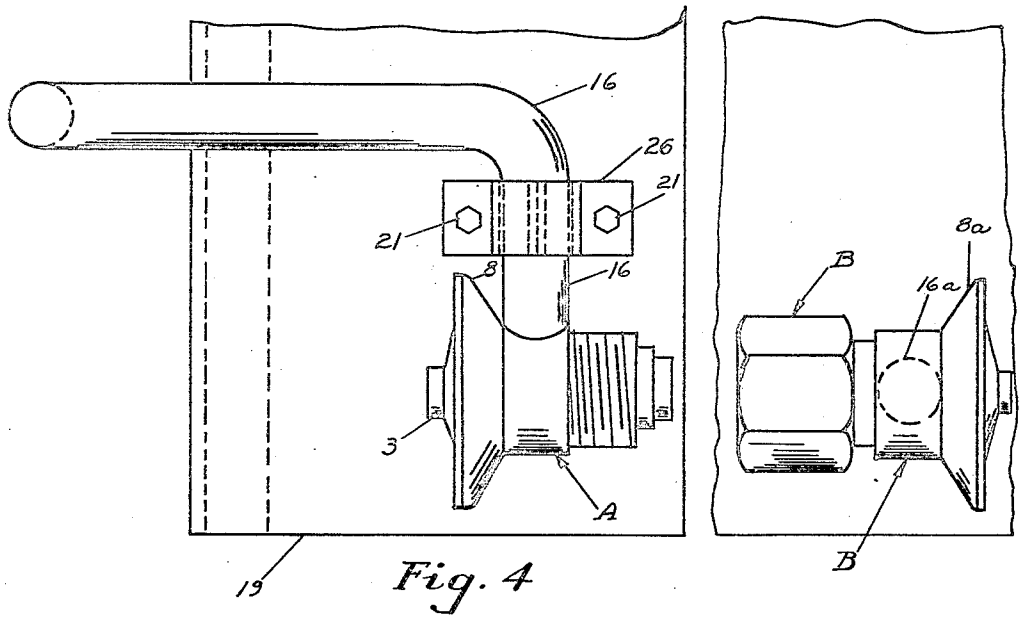


Fig. 4

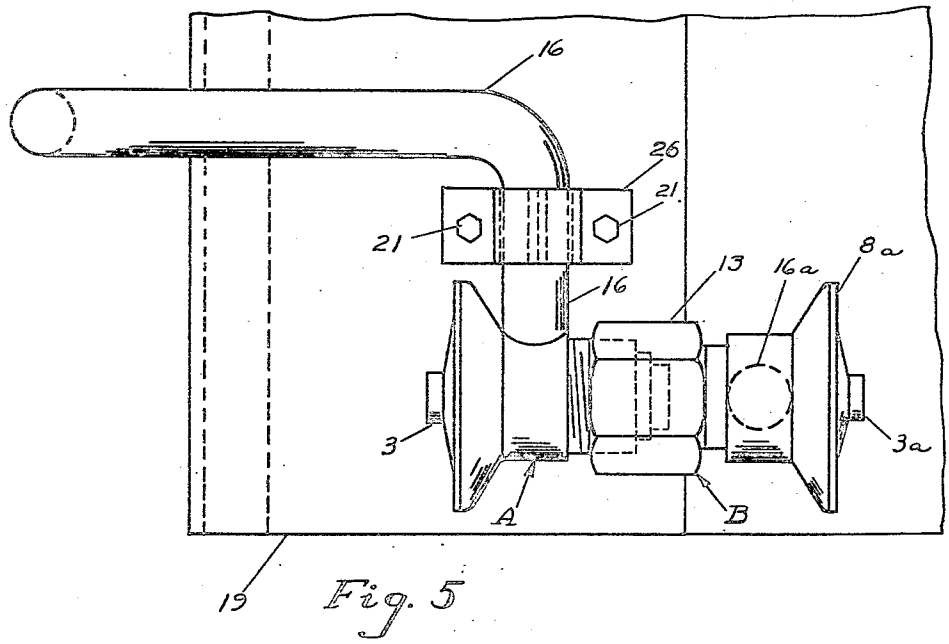


Fig. 5

Inventor
Willard L. Morrison
by Parker & Carter
Attorneys

Patented Apr. 4, 1950 2,502,630

UNITED STATES PATENT OFFICE

2,502,630

VALVED CONNECTION FOR DEMOUNTABLE STRUCTURES

Willard L. Morrison, Lake Forest, Ill.

Application July 20, 1946, Serial No. 685,277

1 Claim. (Cl. 137—69)

1

My invention relates to an improvement in connecting means for refrigerator members.

One purpose is to provide an improved means for connecting evaporator sections of a demountable or demounted refrigerator.

Another purpose is to provide valves and connections for use on a refrigerating machine adapted to be assembled in the space or room where it is to be used.

Another purpose is to provide an efficient and inexpensive connecting valve.

Another purpose is to make a connecting valve which is so constructed that an amateur can assemble it with a minimum of instructions.

Another purpose is to make a form of valve which is inherently free from the possibility of leakage, either before or after the assembling of the component units.

Another purpose is to make a valve which can be reclosed for the disassembly, removal and reassembly of the parts to which the valves are attached.

The present application is an improvement on the structure of my copending application Serial No. 646,588 filed in the United States Patent Office on February 9, 1946.

Other purposes will appear from time to time in the course of the specifications and claim.

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

Figure 1 is an axial section, illustrating the connector in closed position but with the two components of the connector assembled;

Figure 2 is a similar view, but illustrating the two components of the connection in disassembled condition;

Figure 3 is a section, illustrating two adjacent refrigerator or evaporator elements, but illustrating the assembled connection in plan view;

Figure 4 is a plan view, illustrating the individual components of the connection in the disassembled condition corresponding to that of Figure 2; and

Figure 5 is a side elevation of the parts as shown in Figure 3.

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

Referring to the drawings, it will be understood that my connection may be employed between the evaporator components of adjacent refrigerator or insulating housing sections of a demountable or assemblable refrigerator, such as is shown in greater detail in my copending application Serial No. 646,588. It will be understood that any suitable number of evaporator components may be employed, but in the present drawings I illustrate only two abutting components and the connection between them.

2

Referring, for example, to Figure 1, I illustrate a connector including an element generally indicated at A, which may be associated with the refrigerator component C of Figure 3, and a second connector component B, which may be associated with the refrigerator component D of Figure 3. I illustrate, for example, headed piston valves 1 and 1*a*, each of which is shown as having an inclined seat engaging portion 2 or 2*a*. The valves may be urged against their opposed seats in the surrounding valve housings 9 and 9*a* by locking screws 3, 3*a*, screw threaded into elements 6, 6*a*, which, in turn, are associated with outer housings 8 and 8*a*, and abut against thrust blocks 7, 7*a*, operating against flexible diaphragms 5, 5*a*. As will be clear from Figure 1, when the screws 3 and 3*a* are in the locking position, the valves 1 and 1*a* are urged, against the compression of the springs 4, 4*a*, into locking position. This is the initial condition of the parts when they are in the separated position in which they are shown in Figures 2 and 4. Assuming that the user has secured together the adjacent refrigerator sections C and D, for example, by any suitable angle members 19. The component A is secured to the evaporator of the refrigerator component C by a flexible passage or duct 16, suitably secured to the outer valve housing 9, and in communication with the interior passage 20. It may be surrounded by any suitable securing loop or bracket 26, secured to the angle 19, for example, by the screws 21. The opposite component B is shown as secured to the refrigerator component D by any suitable duct 16*a* which, as shown in Figures 2 and 3, extends to and is secured to the valve housing 9*a*, and communicates, by the passage 20*a*, with its interior. Initially, the component A is closed by the removable cap 18, screw threaded as at 15, and provided with any suitable washer 11, surrounding the nipple 10. Similarly the component B is closed by the screw 14, with its head 17, the screw 14 meshing with the internal thread of the sleeve 13 which surrounds the valve housing 9*a*. The sleeve 13 is provided with an intermediate portion of increased internal diameter against which seats the locking ring 12. Any suitable washer 11*a* may be employed. The operator removes the closures 17 and 18. He may then thread the sleeve 13 about the exterior threads of the opposite valve housing 9. The

result is to draw the parts together, as shown in Figure 1, against and about the washer 11. Preferably the washer 11a is also left in place and the result is the effectively greater washer shown in Figure 1 at 11. When the two components have thus been connected, the operator can then release the socket screws 3 and 3a. As he does so, the springs 4 and 4a will move the valve plungers 1 and 1a from the closed position in which they are shown in Figure 1 to a suitable open position. The volatile refrigerant can then flow through the passages 16, 20, 16a and 20a, and through the space about the valve pistons. Preferably the valve seats opposed to the valve pistons 1 and 1a are of softer material than the valves themselves, permitting an effective locking action. When the socket screws 3 and 3a are released, the diaphragms 5 and 5a are flexed as far as the screws will permit them to go, or until the blocks 7 and 7a contact the outer wall of the diaphragm housing. The washers 11 and 11a may be of any suitable resilient or deformable material. The ring 12 is preferably a resilient split ring. It will be understood that the parts may be changed, with the connecting members closed, as shown in Figures 2 and 4, with the volatile refrigerant divided or distributed through the various evaporator components. There can be no leakage past the diaphragms 5 or 5a, and the washers 11 and 11a are compressed by the outer closures 18 and 17, respectively. The socket screws 3 and 3a preferably are sufficiently tightened to provide a firm contact between the valves 1 and 1a and the opposed, softer valve seat. In order to cause any loss it would be necessary both to loosen the members 18 and 17, and the socket screws 3 or 3a.

The details of securing the components of the connecting means together can be widely variant. However, I find it convenient to employ the arrangement as shown in Figure 3. In Figures 3, 4 and 5 I show the connection attached to the two adjacent refrigerator components. The component A of the valve is shown as connected by a bent duct portion 16 to the refrigerator component C, to which the angle 19 is secured. The duct 16 may be held loosely by the bracket 26. The B component of the connection may be secured to the refrigerator component D, for example, by nuts 22 and 23. When the refrigerator components C and D are secured together by one or more of the angles 19, then the connector components A and B can readily be fitted together. Preferably there is a loose fit with the bracket 26, which renders it easy to remove the closure members 17 and 18 and to screw the securing sleeve or nut 13 into the position in which it is shown in Figure 1, with adequate compression of the washer 11.

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

The use and operation of my invention are as follows:

This invention may be considered in conjunction with my copending application Serial No. 646,588.

Since it is the intent of that application to disclose a type of structure that can be assembled by one unskilled in the refrigeration art, it is evident that the means of making the refrigeration connections between the various members must be of such a design and construction that the uninitiated can follow a few simple directions and effect the connections without danger of making them imperfectly so that they will leak, or of performing the operations incompletely so as to cause restrictions in the flow of the refrigerants.

When the members of the refrigeration apparatus assembly are to be placed together the instructions will be to make sure that the screws 3 and 3a are firmly tightened before temporary sealing members 17 and 18 are removed. The parts are then assembled in such a manner that the tubular member 10 bearing the sealing washer 11 will enter into the tubular member 19a and the internal threads 4 of the nut 13 will engage easily with external threads 15 of body member 9. Because of the complete enclosure of sealing washer 11 a relatively light engagement of these threaded parts 14 and 15 will effectively prevent any leakage past the sealing member 11. The screws 3 and 3a can be completely removed and the pressure of springs 4 and 4a will open the valves and thereby connect the refrigeration cavities 20 and 20a of the parts together.

I claim:

In combination, a pair of sleeves each closed at one end, open at the other, each having a valve seat adjacent its open end, a plug valve in each sleeve longitudinally movable between the closed end and the valve seat, yielding means tending to unseat the valve, a gas-tight diaphragm associated with the opposed end of the valve and forming a portion of the closure of the valve sleeve, adjustable means outside the diaphragm for overcoming the yielding means to seat the valve, pipes extending laterally one from each sleeve, each threaded for connection to a gas line, a coupling enclosing the opposed open ends of both sleeves, packing means between the sleeves, the coupling being rotatably mounted on one sleeve and threaded on the other whereby the coupling may compress the packing and hold the two sleeves in alignment.

WILLARD L. MORRISON.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
170,305	Sampson	Nov. 23, 1875
1,747,359	Gibson	Feb. 18, 1930
2,125,554	Franck	Aug. 2, 1938

FOREIGN PATENTS

Number	Country	Date
774,961	France	Dec. 17, 1934