

No. 632,860.

Patented Sept. 12, 1899.

A. WILKINSON.
EXPANSION VALVE.

(Application filed Sept. 30, 1898.)

(No Model.)

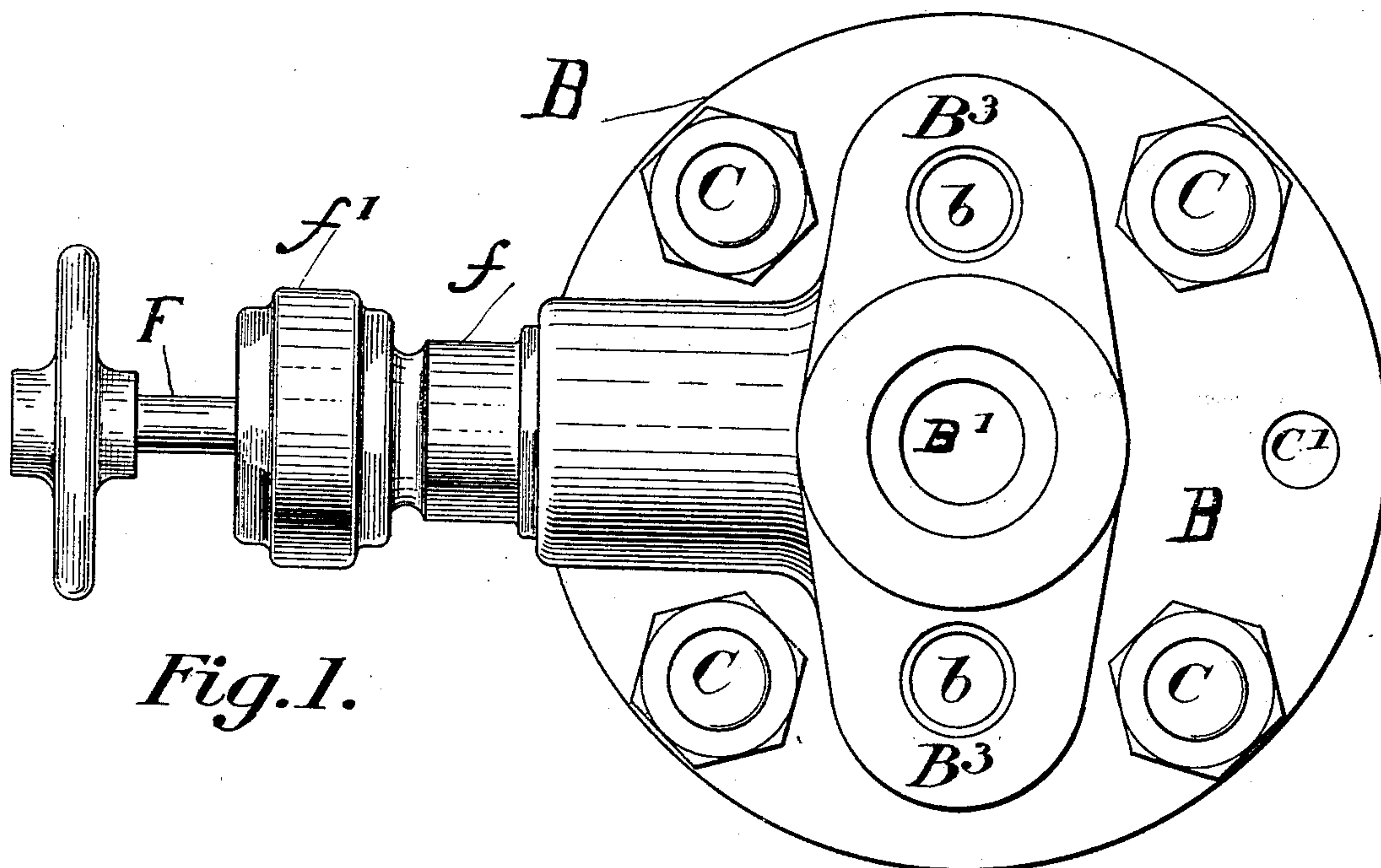


Fig. 1.

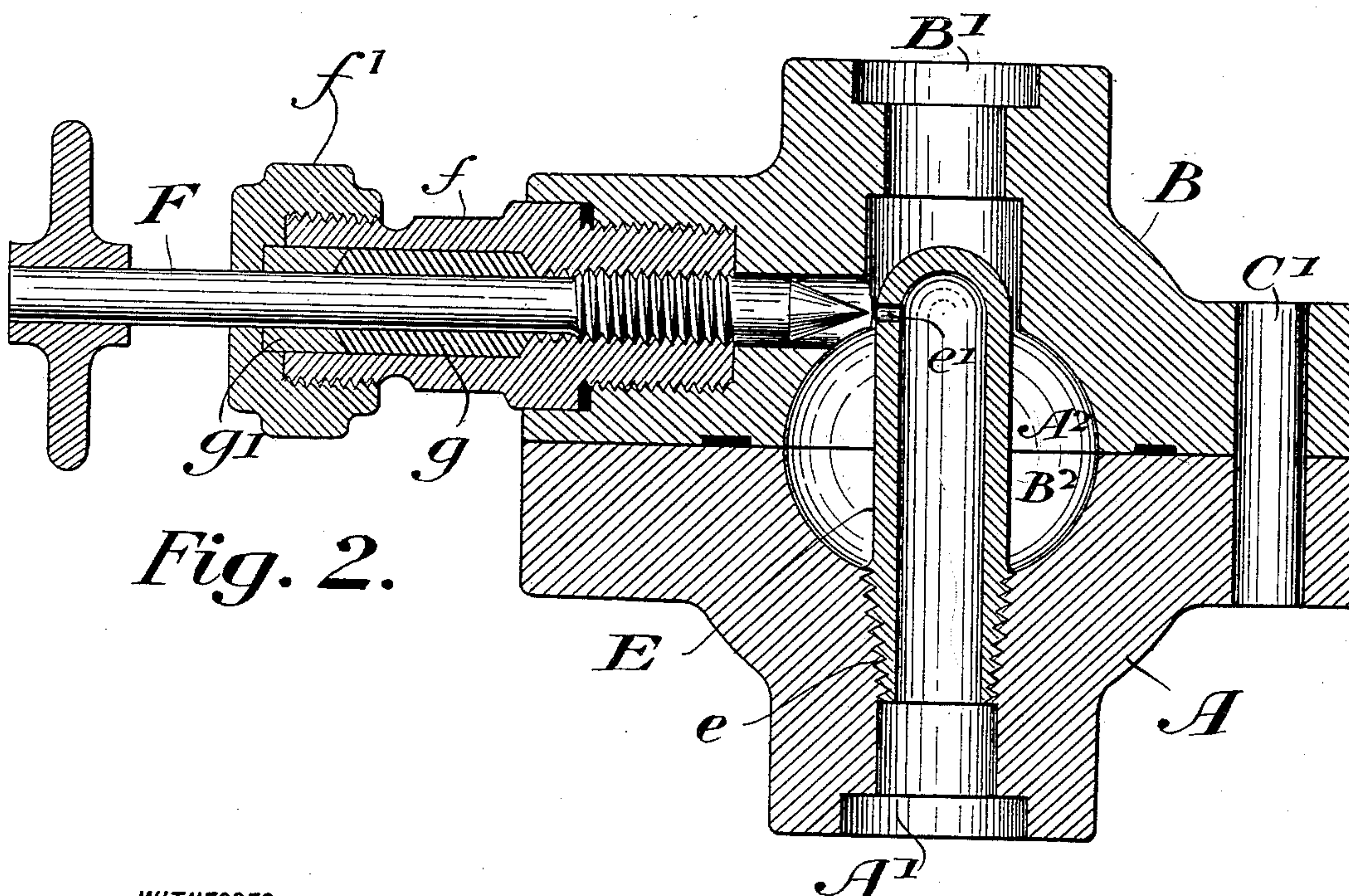


Fig. 2.

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ABRAHAM WILKINSON, OF LORAIN, OHIO, ASSIGNOR TO THE COCHRAN COMPANY, OF SAME PLACE.

EXPANSION-VALVE.

SPECIFICATION forming part of Letters Patent No. 632,860, dated September 12, 1899.

Application filed September 30, 1898. Serial No. 692,285. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM WILKINSON, of Lorain, in the county of Lorain and State of Ohio, have invented a new and useful Improvement in Expansion-Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to refrigerating systems, and has for its general object the provision of an improved expansion-valve in which there is no danger of the valve becoming partially or wholly choked by the freezing of the moisture contained in the refrigerating element.

I have especially designed my improved valve for that type of refrigerating system in which carbonic acid is used as the active element, and hereinafter I shall for the sake of brevity refer exclusively to such a system; but it is of course clear that the use of this particular refrigerating element is in no way essential to the enjoyment of the advantages of my invention.

It is almost impossible in refrigerating systems to prevent a certain amount of moisture from becoming commingled with the refrigerating element, and as the orifice which connects the two sides of the system is a small one it frequently happens that this moisture congeals and either closes or partially closes the expansion-orifice. It is naturally of great importance to prevent this choking up of the expansion-orifice in order that uniformity and constancy of operation be insured. My invention meets this difficulty, for I provide a valve in which there is a chamber which is filled with liquid carbonic acid and which surrounds a metallic vessel in communication with the expansion side of the system. The expansion-orifice is formed in the wall of the vessel. By this construction I am enabled to surround the expansion side of the system where adjacent to the expansion-orifice by a sufficiently large body of liquid carbonic acid of comparatively high temperature to prevent too intense a coldness from being developed by the expansion of the carbonic acid, there-

by preventing any freezing in the expansion-orifice.

My invention also consists in the specific construction which I have provided for this purpose, by which I am enabled to provide a small valve having few parts, which are firmly secured together, so as to make a very simple, reliable, and durable construction.

Referring to the accompanying drawings, Figure 1 is a plan view of my improved valve, and Fig. 2 is a transverse vertical section through the center of the same.

The valve-casing is composed of two main parts A and B, which are secured together by bolts and nuts C and by the dowel-pin C'. These casing members A and B are each provided with vertical passages A' and B', which register with each other when the valve-casing is secured together. The outer ends of these passages are adapted to be connected to the pipes of the opposite sides of the system, B' being in connection with the high-pressure side, while A' is connected to the expansion side. Lateral extensions, as B³, having orifices b, may be provided to afford ready means of coupling the pipes to the ends of passages A' and B' by means of a coupling—such, for example, as that described in Patent No. 604,159, issued May 17, 1898, to F. A. Phelps, Jr. The inner ends of the passages A' and B' are enlarged at A² and B², so as to form a globular chamber in the center of the valve-casing.

E is a tube or vessel having one end open and forming a dome which extends upwardly into the globular chamber, and this tube is provided near its open end with an external thread e, which screws into a threaded portion of the passage A'. By this construction it will be seen that the interior of the tube or vessel E is in direct connection with the expansion side of the system and itself separates the expansion side of the system from the liquid carbonic acid entering the passage at B'. The expansion-orifice e' is located in the wall of the vessel E, and this orifice may be closed or partially closed, when desired, by means of the valve-stem F, screwed into stuffing-box f, the latter being secured within a

horizontal passage extending through the side of the valve-casing member B into the passage B'.

g represents suitable packing, *g'* the packing-ring, and *h* the packing-nut.

Obviously the globular chamber at the center of the casing will be at all times filled with liquid carbonic acid, which is at substantially atmospheric temperature. This body of comparatively warm carbonic acid surrounding the metallic walls of the dome E will provide sufficient heat to prevent a fall of temperature within the dome sufficiently great to produce any deleterious effects. I have found in practice that it prevents all choking of the orifice *e'* and that no ice or snow will form on the walls of the member B.

Of course my invention is broader than the specific construction by which I have illustrated it, and therefore I in no way limit myself to such specific construction.

Having thus described my invention, what I claim, and desire to protect by Letters Patent, is—

1. In an expansion-valve for refrigerating systems, the combination of a chamber designed to contain a quantity of the compressed refrigerant, an entrance thereto from the high-pressure side of the system, a vessel within said chamber, an outlet from the interior thereof to the expansion side of the system, and an orifice in the wall of said vessel connecting its interior with the said chamber.

2. In an expansion-valve for refrigerating systems, the combination of a valve-casing containing a chamber designed to contain a body of the refrigerant from the high-pressure side of the system, an entrance thereto from the high-pressure side of the system, a metallic tube extending into and surrounded by said chamber, and outlets from the interior of said tube to the chamber and to the expansion side of the system.

3. In an expansion-valve for refrigerating systems, a chamber containing compressed carbonic acid and in communication with the

supply thereof, a metallic vessel in communication with the expansion side of the system and surrounded by the contents of said chamber, and an orifice through the wall of the vessel connecting the interior thereof with the contents of said chamber.

4. In an expansion-valve the combination of the central chamber in communication with the high-pressure side of the system, the metallic tube extending into said chamber and having an open end secured in the passage to the expansion side of the system and the orifice in the wall of said tube forming a passage from the chamber to the interior of said tube.

5. In an expansion-valve, the combination of the valve-casing members A and B, registering passages A' and B' therein having enlarged ends A² and B² forming a central chamber, metallic tube E screwed into the end of passage A' and extending upwardly into said chamber, orifice *e'* in the upper part of said tube, and valve-stem F adapted to enter orifice *e'*.

6. In an expansion-valve for refrigerating systems, the combination of a two-part valve-casing, registering passages therein adapted at their ends to be connected with the opposite sides of the system and enlarged at their centers to form a central globular chamber, a metallic tube extending upwardly into said chamber and having a threaded end securing it in the passage to the low-pressure side of the system, said tube being open at its threaded end and closed at its other end, an orifice in the side of the tube, a passage opposite the same through one wall of the valve-casing members, and a valve-stem movable in said passage and adapted to enter the said orifice.

In testimony whereof I have affixed my signature in presence of two witnesses.

ABRAHAM WILKINSON.

Witnesses:

THOS. J. JOHNSON,
H. M. DAVIES.