

No. 827,521.

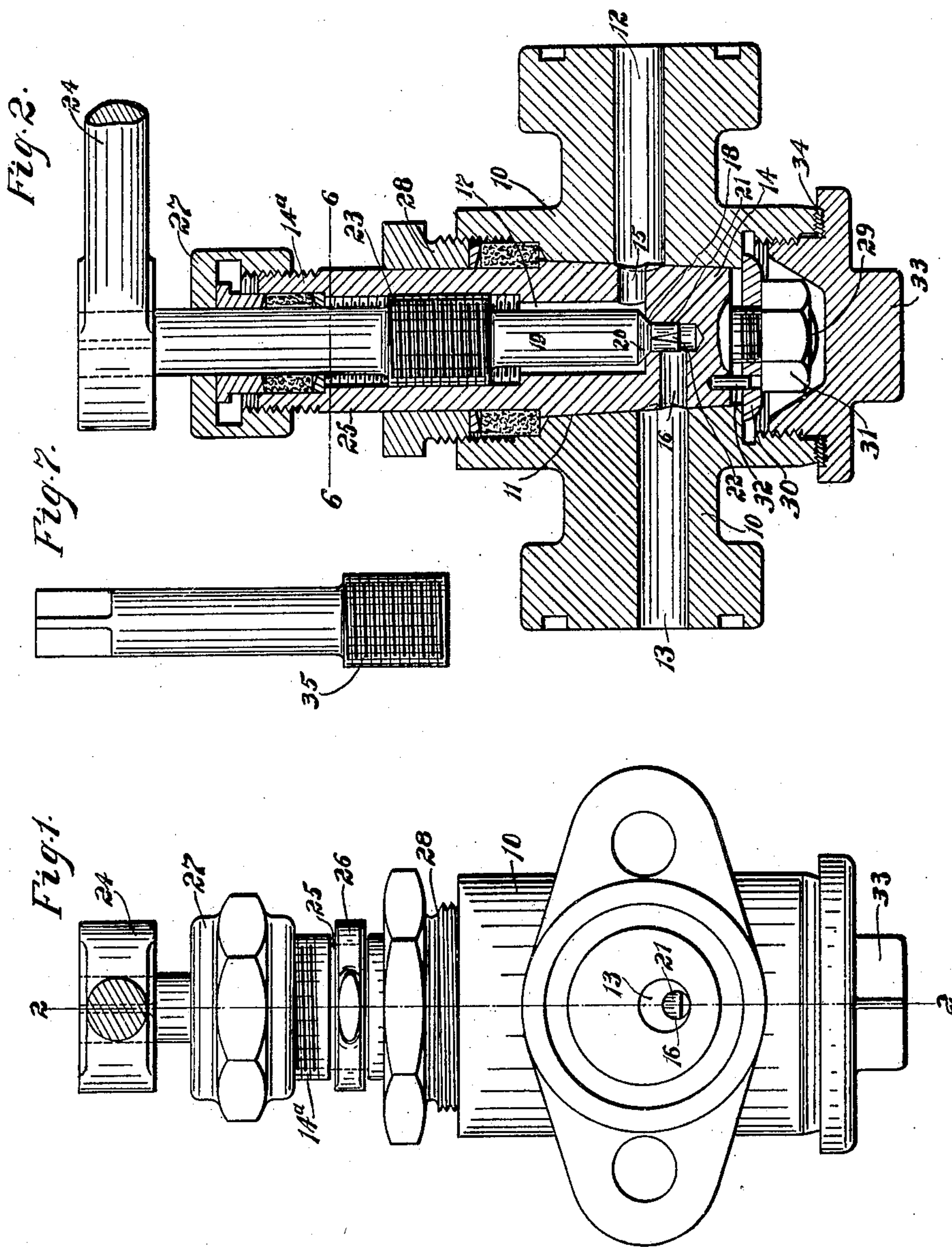
PATENTED JULY 31, 1906.

F. W. FELSBERG.

COMBINED STOP COCK AND EXPANSION VALVE.

APPLICATION FILED JUNE 14, 1905.

2 SHEETS—SHEET 1.



Witnesses:

George J. Schwarz
Fred J. Kinsey.

Inventor:

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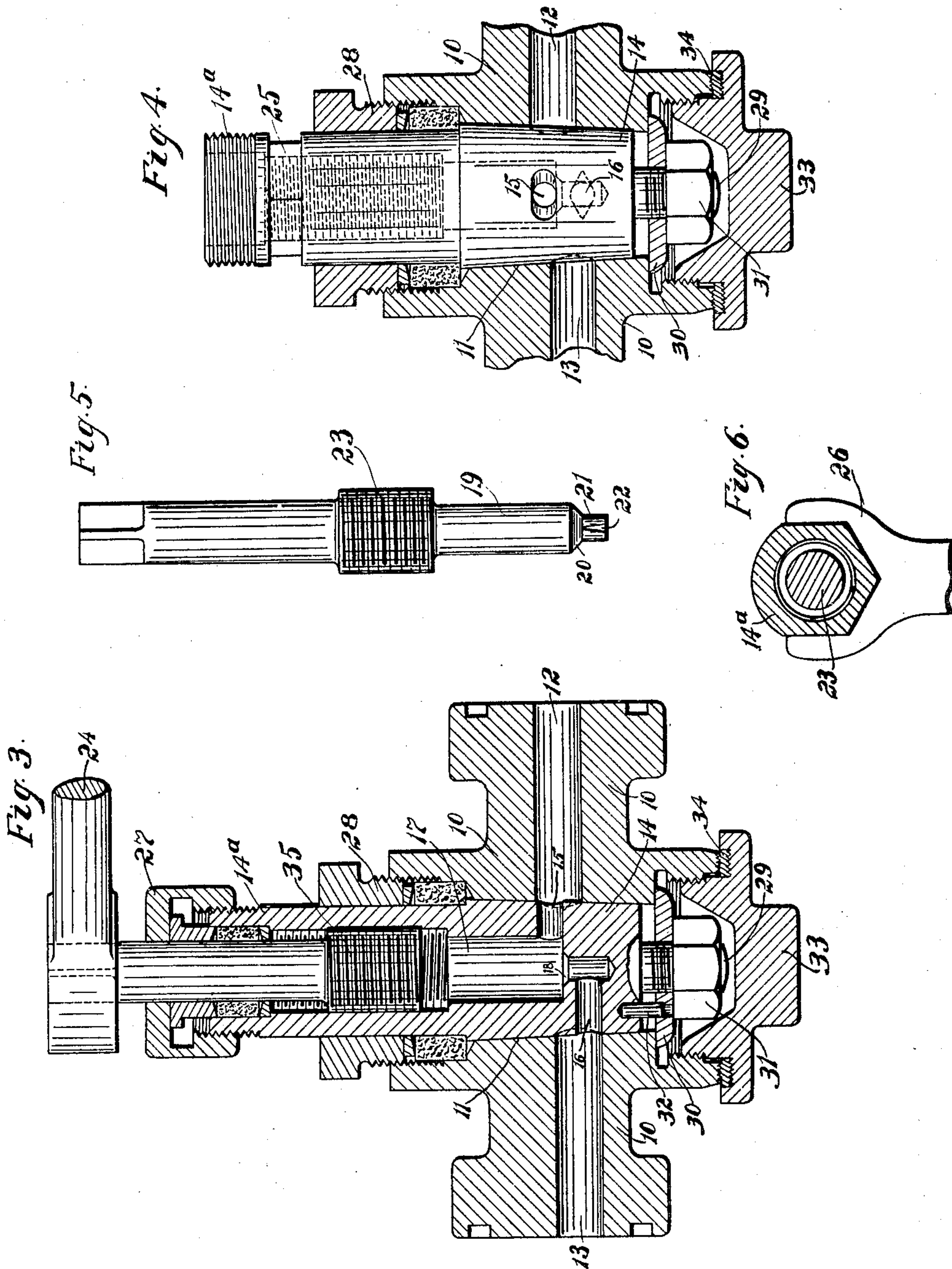
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Fred J. Givney.

Inventor:
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UNITED STATES PATENT OFFICE.

FREDERICK W. FELSBERG, OF DAYTON, KENTUCKY, ASSIGNOR TO THE
TRIUMPH ICE MACHINE COMPANY, OF CINCINNATI, OHIO.

COMBINED STOP-COCK AND EXPANSION-VALVE.

No. 827,521.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed June 14, 1905. Serial No. 265,149.

To all whom it may concern:

Be it known that I, FREDERICK W. FELSBERG, a citizen of the United States, residing at Dayton, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in a Combined Stop-Cock and Expansion-Valve, of which the following is a full, clear, and exact specification.

My present invention relates to improvements in the construction of valves, and especially to expansion-valves particularly adapted for use in refrigerating and ice-making machinery.

In the majority of refrigerating plants operating on the ammonia expansion system and employing the ordinary form of expansion-valves the annual expense due to the necessity of repairing and reseating the expansion-valves is enormous, as in order to make such repairs the entire refrigerating system must be completely evacuated, numerous disconnections made, and the valve removed from its casing. Furthermore, considerable valuable time is lost and much trouble is experienced by such a procedure.

The object of my invention is to avoid the difficulties above enumerated and to reduce the time, labor, and expense heretofore required to repair or replace the expansion-valves.

A further object is to permit the expansion-valve to be reground, reseated, or otherwise repaired without the necessity of pumping out the piping system or interrupting the operation of refrigerating system in any manner.

The invention consists of a combination stop-cock and expansion-valve, the expansion-valve being arranged within the plug of the stop-cock in such a manner that the ports of the stop-cock may be closed to permit the expansion-valve to be removed and repaired, or the expansion-valve may be replaced readily by a plug-stem and the stop-cock employed as an expansion-valve while the regular expansion-valve is being reground, reseated, or otherwise repaired.

The invention further consists of details of construction of said combined stop-cock and expansion-valve, which will be hereinafter described, and more particularly pointed out in the appended claims.

In the accompanying drawings, which illustrate the preferred embodiment of my invention, Figure 1 is a side elevation of my combination stop-cock and expansion-valve. Fig. 2 is a longitudinal section through same on the line 2 2, Fig. 1. Fig. 3 is a view similar to Fig. 2, showing the arrangement employed when the stop-cock is used as an expansion-valve. Fig. 4 is a detail section view showing the stop-cock plug in elevation and in its closed position. Fig. 5 is a view of the expansion-valve stem. Fig. 6 is a section on line 6 6 of Fig. 2, and Fig. 7 is a view of the plug-stem.

Referring now to the drawings, the valve-casing 10 is provided with the conical valve-seat 11 and with the ports 12 and 13, the port 12 acting as the inlet to the valve and the port 13 acting as the exhaust for the valve. Mounted in the conical seat 11 is the conical plug-valve or stop-cock 14, provided with the passage-ways 15 and 16, which are adapted to register with and control the ports 12 and 13. The passage-way 15 leads to the chamber 17 in the hollow plug-valve 14 just above the valve-seat 18, and the passage-way 16 leads from said chamber just below said valve-seat. The expansion-valve stem 19 coöperates with said valve-seat to control the flow of gas or liquid through the passage-ways in said plug-valve. The lower end of this valve-stem is provided with the conical valve-seat 20 and with the cylindrical extension 21, having the V-shaped groove 22 formed therein. The position of this V-shaped groove relative to the valve-seat 18 determines the flow through the expansion-valve.

The interior surface of the cylindrical extension 14^a of the plug-valve 14 is threaded to receive the threaded collar 23, formed on the expansion-valve stem 19. The upper end of said stem 19 is formed with a square head to receive the removable operating-handle 24. The extension 14^a is formed at 25 with flattened sides to receive a wrench or other removable handle 26 for operating the stop-cock. This is clearly shown in Fig. 6. The stem 19 is surrounded by the stuffing-box 27 and the extension or plug valve 14 is surrounded by stuffing-box 28, mounted in the casing 10. The lower end of the plug-valve 14 is provided with the projecting stud

29, which receives the washer 30 and nut 31, serving to hold the plug-valve tightly in its conical seat. The washer 30 is prevented from rotating relative to valve 14 by the pin 5 32. The lower end of said valve is protected by the cap 33, which is threaded into the casing 10 and is provided with the babbitted joint 34 to prevent the escape of the ammonia from said valve-casing.

10 In the normal operation of my improved valve the stop-cock is in the position shown in Fig. 2, and the expansion-stem 19 is adjusted relative to its seat 18 to permit the desired expansion, the ammonia liquid or gas 15 entering through port 12, thence passing through passage-way 15 into chamber 17, and from thence through the V-shaped groove 22 to passage-way 16 and thence to port 13. When it is desired to remove the 20 expansion-valve for any cause, the stop-cock is rotated, by means of the independent handle 26, into the position shown in Fig. 4, thus completely cutting off the chamber 17. The expansion-valve may then be removed with- 25 out the necessity of pumping out the entire refrigerating system, which, as will be understood, is filled with ammonia gas and liquid under high pressure. During this operation of removing the stuffing-box 27 and unscrew- 30 ing the valve-stem 19 no gas escapes. The stop-cock may, if so desired, be retained in this position until the trouble with the expansion-valve has been remedied, or if this repairing, &c., is to take any appreciable 35 length of time the expansion-valve may be replaced by the plug-stem 35, as clearly shown in position in the valve in Fig. 3 and removed from said valve in Fig. 7, and the

stop-cock adjusted by means of handle 26 to act as an expansion-valve. 40

I aim in the appended claims to cover all modifications of my invention which do not involve a departure from its spirit and scope.

Having thus described my invention, what I claim as new, and desire to secure by Let- 45 ters Patent, is—

1. As a combined stop-cock and expansion-valve for refrigeration-machines, a valve-casing provided with ports, a plug-valve provided with a passage-way adapted to regis- 50 ter with and control the ports in said casing, a valve-seat in said plug-valve, a readily-removable expansion-valve stem mounted within said plug-valve and adapted to en- 55 gage said valve-seat to control the passage-way through the plug-valve, and a plug-stem capable of replacing said expansion-valve stem to permit said rotatable plug-valve to be used as an expansion-valve.

2. As a combined stop-cock and expansion-valve for refrigerating-machines, a valve-casing, a hollow plug-valve rotatably mount- 60 ed in said casing and having a passage-way therethrough, a valve-seat in said passage-way, a readily-removable valve-stem coöper- 65 ating with said seat and movable toward and away from same to act as an expansion-valve, and a plug-stem replacing the expansion-valve to permit said rotatable plug- 70 valve to be used as an expansion-valve.

In testimony whereof I hereby affix my signature in the presence of two witnesses.

FREDERICK W. FELSBERG.

Witnesses:

EDW. MAULINIER,
J. S. LOUIS.