

(No Model.)

2 Sheets—Sheet 1.

C. F. SAUTTER.
THERMOSTATIC VALVE REGULATOR.

No. 406,775.

Patented July 9, 1889.

Fig. 1.

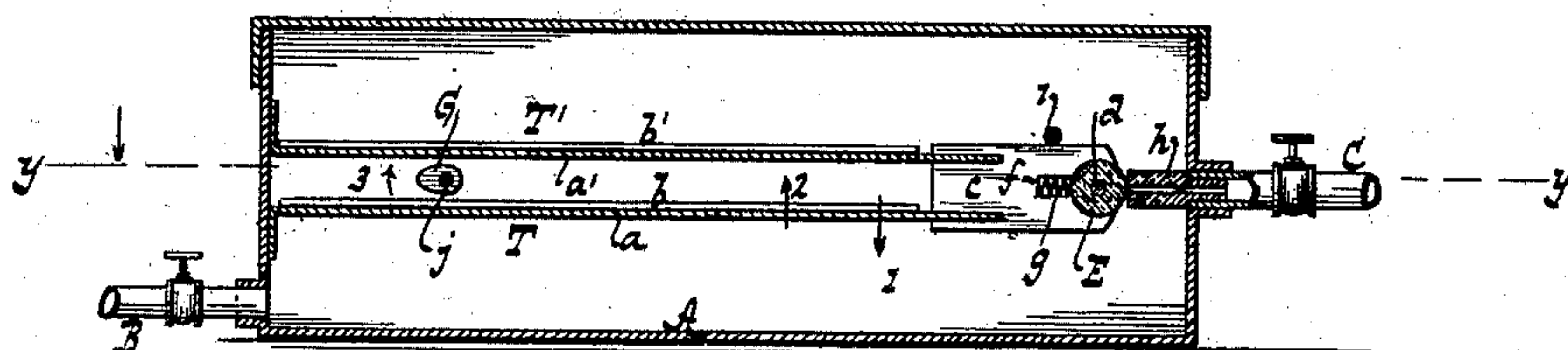
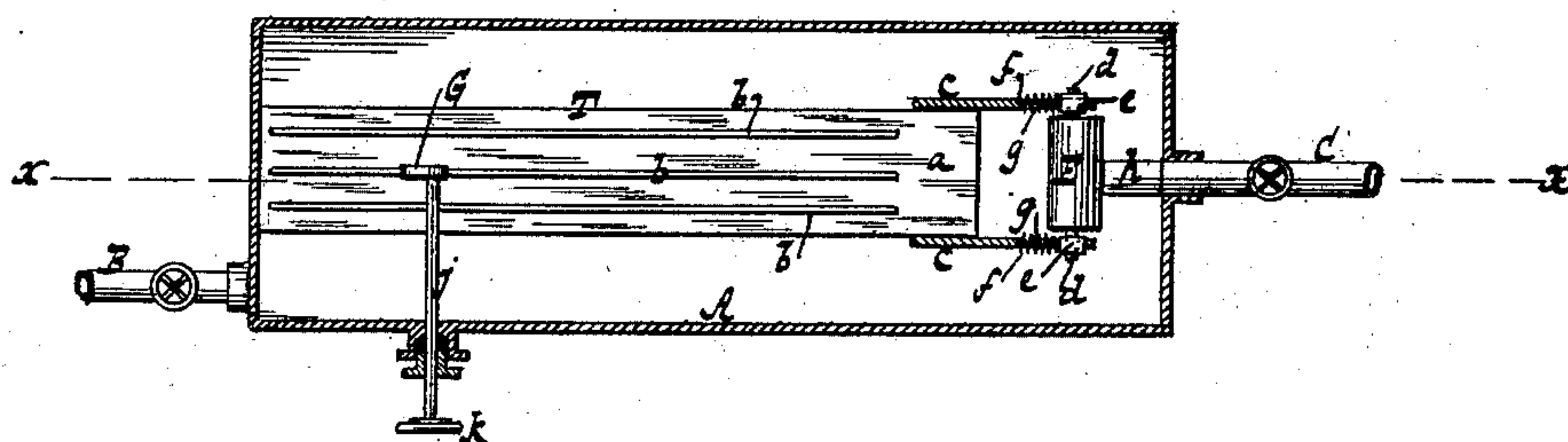


Fig. 2.



WITNESSES:

William Miller
Eduard Wolff.

INVENTOR:

Charles F. Sautter

BY

Van Gantvoord & Smith

ATTORNEY

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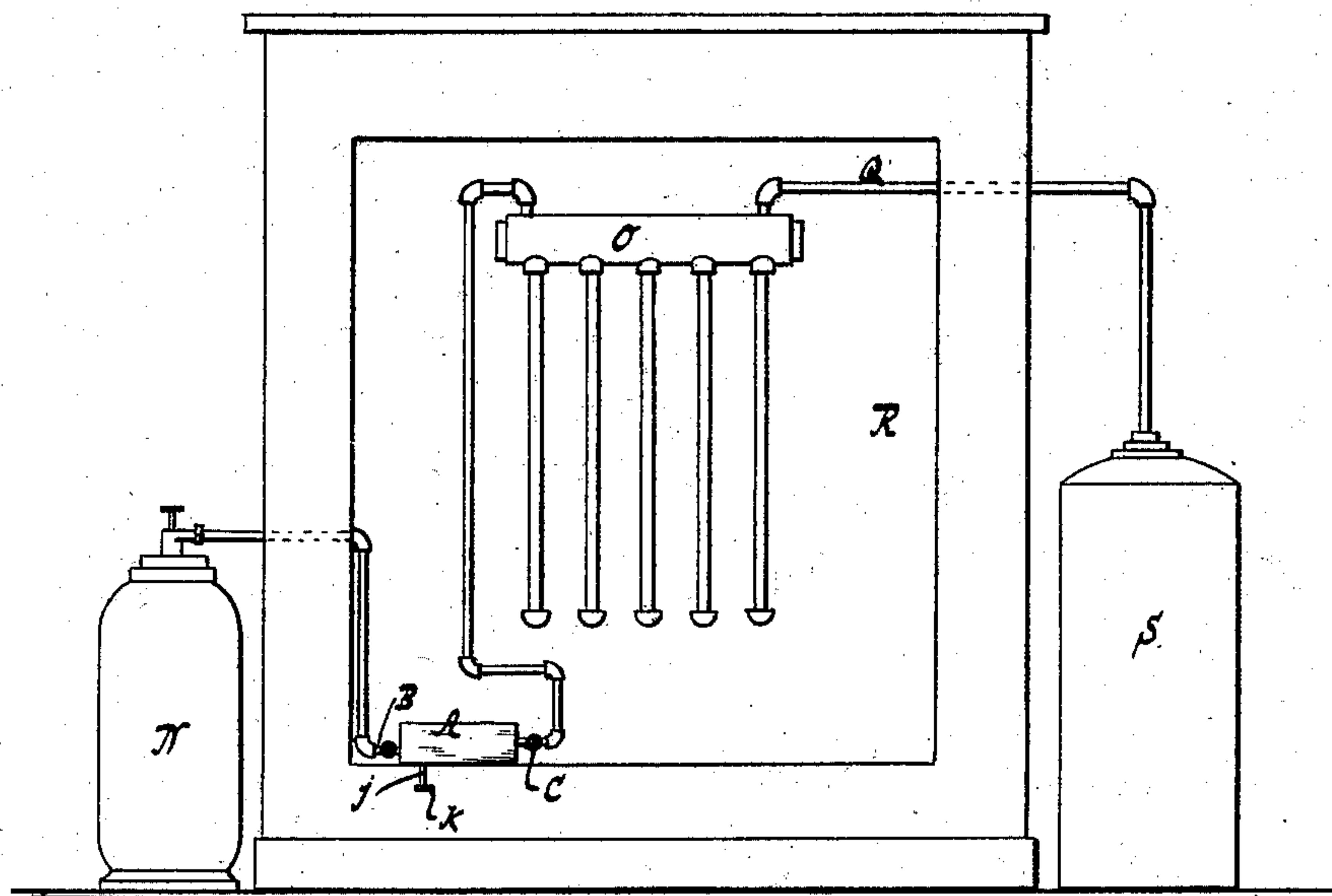
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Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES F. SAUTTER, OF BROOKLYN, NEW YORK.

THERMOSTATIC-VALVE REGULATOR.

SPECIFICATION forming part of Letters Patent No. 406,775, dated July 9, 1889.

Application filed October 27, 1888. Serial No. 289,318. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. SAUTTER, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Automatic Valves for Refrigerators, of which the following is a specification.

This invention relates to a valve which is intended to be used particularly on apparatus for producing cold by the expansion of a gaseous fluid, and which serves to regulate automatically the supply of gas to the expansion-chamber according to the temperature existing in said chamber.

The peculiar and novel construction of my valve is pointed out in the following specification and claims, and illustrated in the accompanying drawings, in which—

Figure 1 represents a longitudinal vertical section in the plane xx , Fig. 2. Fig. 2 is a horizontal section in the plane yy , Fig. 1. Fig. 3 is a front elevation of a refrigerator provided with my automatic valve.

Similar letters indicate corresponding parts.

In the drawings, the letter A designates a box, which is made of a good conductor of heat—such as sheet-steel—and of sufficient strength to withstand the internal pressure to which it may be exposed. This box connects by a pipe B with a fountain N, Fig. 3, which contains anhydrous ammonia, and by a pipe C with the expansion-chamber O, which is secured in the refrigerator R, Fig. 3, and from which leads a pipe Q into the absorber S. In the interior of the box A is secured a thermostat T. In the example shown in the drawings the thermostat consists of a plate a of sheet-zinc, on which are firmly secured three pieces $b b b$, Fig. 2, of thin steel wire, and, since zinc is expanded and contracted at a greater ratio than steel by changes in the temperature, the free end of the thermostat will turn in the direction of arrow 1, Fig. 1, when the temperature increases and in the direction of arrow 2 when the temperature decreases. In the example represented by the drawings I have shown two thermostats T T', in order to insure a more powerful action, the thermostat T' being composed of a zinc plate a' and steel wires b' precisely like the thermostat T. The ends of the zinc plates $a a'$ of the two thermostats are connected by

metal plates $c c$, which support the axle d of a roller E. The boxes $e e$, which form the bearings for said axle, are fitted into slots f in the plates $c c$ and exposed to the action of springs $g g$, which have a tendency to force the roller E outward. The pipe C is provided with a tip h , which is by preference made of glass or other vitreous material and provided with a very small channel and with a flat face, which is placed in such a position that the mouth of said channel will be closed by the roller E when the latter is brought into the position shown in Figs. 1 and 2. A stop i prevents the roller E from moving beyond its closing position in the direction of arrow 2, Fig. 1.

At the ordinary or mean temperature the thermostat T causes the roller E to move from its closing position in the direction of arrow 1, and the mouth of the tip h is open; but when the communication between the fountain N and the expansion-chamber O is opened the temperature in the refrigerator will be rapidly decreased, and when the temperature has reached the desired point to which the thermostat has been adjusted the roller E is moved by the action of the thermostat T to its closing position, so that the supply of gas to the expansion-chamber is checked. As soon as the temperature in the refrigerator rises, however, the roller E is moved so as to open the pipe C and a fresh supply of gas is admitted to the expansion-chamber O. The roller E therefore forms a valve which regulates the supply of gas to the expansion-chamber automatically, according to the temperature existing in the refrigerator to which the thermostat is adjusted.

The thermostat may be permanently adjusted to a certain predetermined temperature; but I prefer to apply an adjusting device G, by means of which the thermostat can be set to a higher or lower temperature, as may be desirable. This adjusting device consists of an eccentric, which is situated between the thermostats T T' and mounted upon a shaft j , which extends through a stuffing-box in the side of the box A, and which can be turned by means of a hand-wheel k . If the shaft j is turned in the direction of arrow 3, Fig. 1, the eccentric G is brought to bear against the zinc plate a' of the thermostat T'

and the power required to move the valve E from its closing position is increased, or in other words a higher temperature is required to move the valve from its closing position than before. If the eccentric G is turned in the direction opposite to arrow 3, it will bear against the plate *a* of the thermostat T and the valve E will be moved from its closing position, so that the temperature must be lowered in order to carry the valve back to its closing position. In other words, by turning the eccentric G in the direction of arrow 3 the thermostat is adjusted to a higher temperature, and by turning the eccentric G in the direction opposite to arrow 3 the thermostat is adjusted to a lower temperature.

What I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus for producing cold by the expansion of a gaseous fluid, the combination, with the expansion-chamber O, of the closed box A, the gas-supply pipe B, leading into said box, the pipe C, leading from the box into the expansion-chamber, the valve adapted to close the pipe C, and the thermostat adapted to control the position of the valve, both the expansion-chamber and the closed box being situated in the refrigerator, substantially as described.

2. The combination, with the expansion-chamber O, of the closed box A, the gas-supply pipe B, leading into said box, the pipe C, leading from the box into the expansion-chamber, the tip *h*, secured in said pipe, the spring-pressed roller-valve E, adapted to close the mouth of the tip *h*, and the thermostat adapted to control the position of the valve, both the expansion-chamber and the closed box being situated in the refrigerator, substantially as described.

3. The combination, with the expansion-chamber O, of the closed box A, the gas-supply pipe B, leading into said box, the pipe C, leading from the box into the expansion-chamber, the valve adapted to close the pipe C, the thermostat adapted to control the position of the valve, and the adjusting device G, both the expansion-chamber and the closed box being situated in the refrigerator, substantially as described.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

CHAS. F. SAUTTER. [L. s.]

Witnesses:

W. C. HAUFF,

E. F. KASTENHUBER.