No. 761,701. PATENTED JUNE 7, 1904.

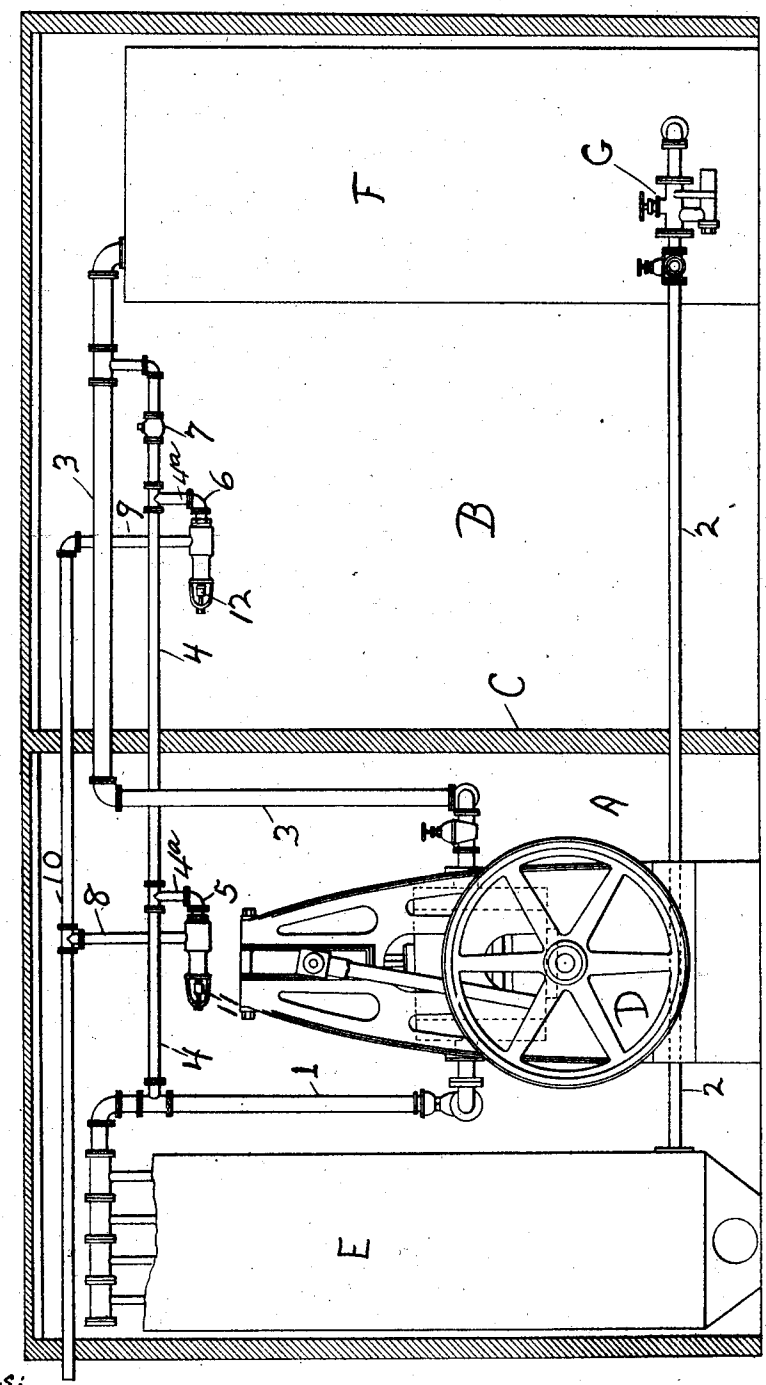
C. C. PALMER.

REFRIGERATING APPARATUS.

APPLICATION FILED AUG. 22, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
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George A. Roeder.

Inventor
Cassius C. Palmer
by Griffin & Bissell Att'ys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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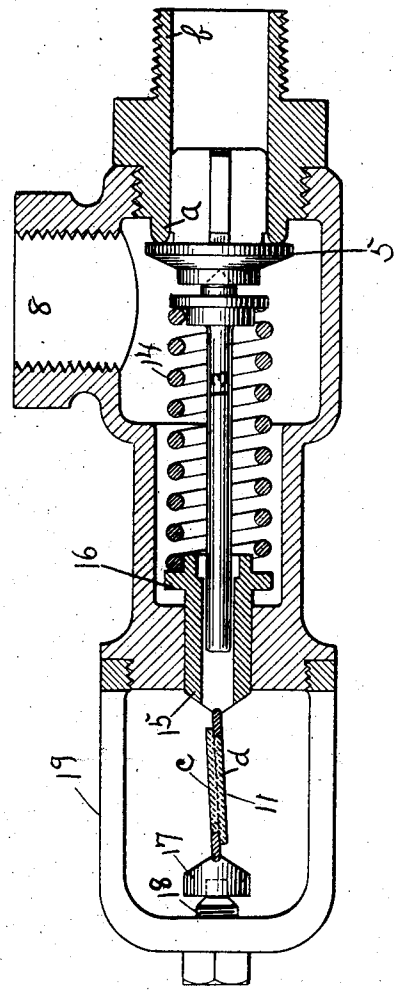
APPLICATION FILED AUG. 22, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig.3



Fig.2



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 761,701. Patented June 7, 1904.

UNITED STATES PATENT OFFICE.

CASSIUS CLAY PALMER, OF NEW YORK, N. Y., ASSIGNOR TO RAILWAY AND STATIONARY REFRIGERATING COMPANY, A CORPORATION OF DELAWARE.

REFRIGERATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 761,701, dated June 7, 1904.

Application filed August 22, 1903. Serial No. 170,392. (No model.)

To all whom it may concern:

Be it known that I, CASSIUS CLAY PALMER, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, county and State of New York, have invented a new and useful Improvement in Refrigerating Apparatus, of which the following is a specification.

My invention relates to improvements in refrigerating apparatus; and it consists of certain novel features, which will be particularly pointed out in the claims concluding this specification.

The accompanying drawings illustrate my invention in the form which is at present preferred by me, although it will be understood that various changes and modifications may be made without departing from the spirit of my invention.

Figure 1 shows a longitudinal section of a refrigerating apparatus embodying my invention. Fig. 2 is a longitudinal section of one of the safety-valves employed in my invention. Fig. 3 is a longitudinal top view of a fusible plug connected with the safety-valve.

A is the machinery-room; B, the refrigerating-room; C, the partition separating the two rooms.

D is the compressor; E, the condenser; F, the refrigerator; G, the feed-valve.

1 is a pipe leading from the compressor to the condenser, 2 a pipe from the condenser to the refrigerator, and 3 a pipe from the refrigerator back to the compressor.

4 is a pipe leading from the pipe 1 to pipe 3. This constitutes a by-pass past the compressor connecting the exhaust side with the compression side. In this pipe are placed the safety-valves 5 and 6, each being provided with a fusible plug 11 and 12, also the ordinary check-valve 7. The valves 5 and 6 are each connected with the pipe 4 by the branch pipes 4^a 4^a. These valves 5 and 6 may be described as follows, reference being had to Figs. 2 and 3. I will refer to the valve 5 and plug 11; but it will be understood that the same description is applicable to valve 6 and plug 12. The seat *a* for the valve 5 is secured to a hollow section which is screwed into the valve-case. The other end, *b*, of this piece is connected to the branch 4^a of the pipe 4. The valve is held to its seat by means of the pin 13 and spring 14. The outer end of the pin 13 fits in a hollow cylinder 15, which extends through the valve-case. A washer 16 fits over the end of the cylinder within the case. The spring 14 bears against the opposite side of this washer. The other end of the cylinder 15 is cut away on two sides, and the tips thereof are grooved to receive one end of the fusible plug 11. The other end of the fusible plug rests in a groove in the piece 17, which is held in place by means of a pin 18, secured to the head 19, which is fastened to the valve-case. The fusible plug 11 is composed of two pieces *c* and *d*. Each piece is cut away through a portion of its center. The two are then placed together, so that their ends which are not cut away overlap. The cut-away portions are then filled with solder and the two pieces are secured. The valve 5 is placed in the section of the pipe 4 in the machinery-room, while the valve 6 is in the refrigerating-room. From the valve 5 the pipe 8 and from valve 6 the pipe 9 leads into the pipe 10, which has an outlet exterior to the refrigerating apparatus. The object of these valves is to prevent the possibility of an explosion in the event of a fire occurring in the vicinity of the refrigerating apparatus. The valves 5 and 6 do not become operative except under great pressure (seventy-five pounds to square inch) or great heat, (200°.) Should a fire occur in the compartment A and the heat reach the degree indicated above or should the pressure in the apparatus reach the number of pounds indicated, the fusible plug 11 would melt, or the spring located between fusible plug and valve-seat would be forced out, and thus release the valve 5. By the release of this valve the pressure in the pipe 4 will be released and escape into the open by means of the pipes 8 and 10. The release of pressure in the pipe 4 will release the check-valve 7, which is held in place by the pressure in the pipe 4 and will open the valve 7 and allow

the chemical in the pipe 3 to escape through the valves 7 and 5 and pipes 8 and 10 to the street. Similarly, if a fire occur in the refrigerating-room B and the heat or pressure be great the fusible plug 12 in the valve 6 will be melted or forced out, and thereby release the valve 6, and the pressure in the pipe 4 will exhaust through the pipes 9 and 10. Here, as before described, the release of pressure will open the valve 7 and allow escape from the pipe 3. Thus in or near whichever compartment of the refrigerating apparatus a fire may occur the effect will be to relieve the pressure in both the condenser and the refrigerator.

In the operation of the apparatus the condenser is under pressure and the refrigerator is either under very light pressure or partial vacuum. Consequently the pipe 4, connecting pipes 1 and 3, would be means of a direct circuit which would equalize the pressures in both the condenser and the refrigerator unless a means of preventing it be adopted, which is done by the check-valve 7. This allows the pressure to exist up to the top of the seat of the valve 7, but prevents any circulation past that point. At the same time it provides a means of exit in case the chemical in the refrigerator F becomes at any time in excess of the pressure in the balance of the apparatus, as would be the case were a fire to occur in the refrigerating-room. By this construction the entire contents of the refrigerating apparatus is released by either the operation of valves 5 or 6, making it a complete protection for all parts of the machine.

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

1. In combination in a refrigerating apparatus, the compressor, the condenser, the refrigerator, pipes connecting the same, a by-pass pipe past the compressor, one or more safety-valves and a check-valve in said by-pass pipe.

2. In a refrigerating apparatus consisting of two compartments in combination, a compressor, a condenser, a refrigerator, pipes connecting the same, a by-pass pipe past the compressor, a plurality of safety-valves and a check-valve in said by-pass pipe, one safety-valve being located in each compartment.

3. In a refrigerating apparatus comprising a machinery-chamber and a refrigerating-chamber, in combination a compressor, a condenser, a refrigerator, pipes connecting all of the same, a by-pass pipe past the compressor running through both of said chambers, a check-valve in said pipe and two safety-valves, one safety-valve being located in each chamber.

4. In a refrigerating apparatus comprising a machinery-chamber and a refrigerating-chamber, in combination a compressor, a condenser, a refrigerator, pipes connecting all of the same, a by-pass pipe past the compressor, said by-pass pipe passing through both of said chambers, a safety-valve in each chamber located in said by-pass pipe, a check-valve also in said by-pass pipe, said check-valve being within the refrigerating-chamber and being adapted to open and release the pressure in the apparatus on the release of either safety-valve.

5. In a refrigerating apparatus in combination with the compressor, condenser, refrigerator and pipes connecting all of the same, a by-pass pipe past the compressor, two safety-valves in said pipe, said safety-valves being provided with fusible plugs adapted to melt or be forced out by high temperature or great pressure, a check-valve also in said by-pass pipe, said check-valve being held to its seat by pressure in the by-pass pipe and being adapted to open on the release of either safety-valve and thereby relieve the pressure in the whole apparatus.

6. In a refrigerating apparatus comprising a machinery-chamber and a refrigerating-chamber, in combination with the compressor, condenser, refrigerator and pipes connecting all of the same, a by-pass pipe past the compressor, two safety-valves in said by-pass pipe, one safety-valve being located in each chamber, said safety-valves being provided with fusible plugs adapted to melt or be forced out by high temperature or great pressure, a check-valve also in said by-pass pipe, said check-valve being located in the section of the pipe near the refrigerator, and being held to its seat by pressure in the by-pass pipe and being adapted to open on the release of the safety-valve in either chamber and thereby relieve the pressure in the whole apparatus.

7. In a refrigerating apparatus in combination with the compressor, condenser, refrigerator and pipes connecting all of the same, a by-pass pipe past the compressor, one or more safety-valves in said by-pass pipe, said valve or valves being provided with a spring and a fusible plug, said spring and plug being adapted to be forced out or to melt out at great pressure or high temperature, a check-valve also in said by-pass pipe, said check-valve being held to its seat by the pressure in the by-pass pipe and being adapted to open on the release of either one or more of said safety-valves and thereby relieve the pressure in the whole apparatus.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

CASSIUS CLAY PALMER.

Witnesses:
E. F. PORTER,
WALTER A. PAULING.