

No. 726,216.

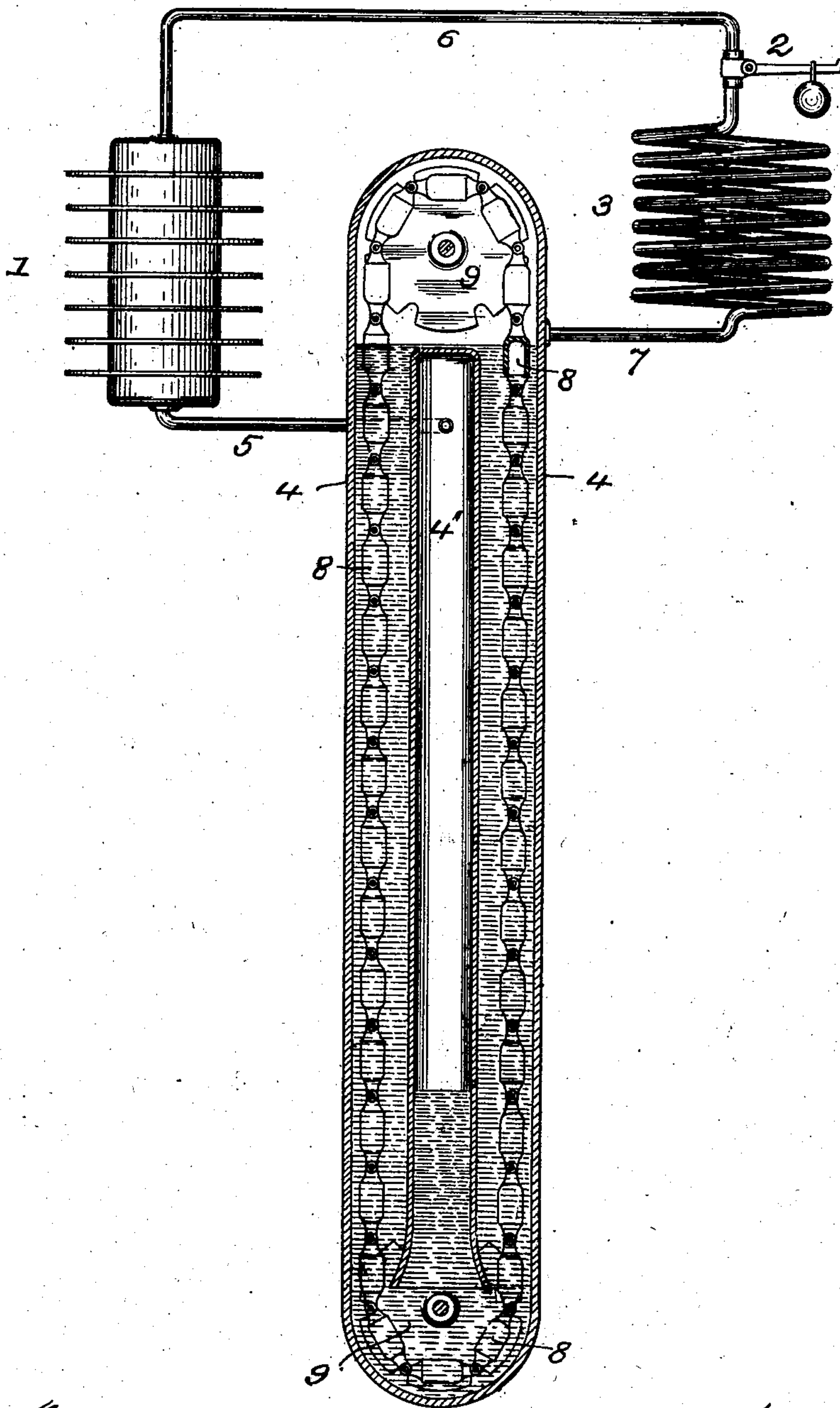
PATENTED APR. 21, 1903

C. J. COLEMAN.

REFRIGERATING APPARATUS.

APPLICATION FILED SEPT. 9, 1899. RENEWED JULY 24, 1902.

NO MODEL.



*Attest*

*Harry R. White.*  
*R. White.*

*Inventor:*

*Clyde J. Coleman.*

*By Robert Burns Attorney.*



# UNITED STATES PATENT OFFICE.

CLYDE J. COLEMAN, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO CLARENCE W. COLEMAN.

## REFRIGERATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 726,216, dated April 21, 1903.

Application filed September 9, 1899. Renewed July 24, 1902. Serial No. 116,777. (No model.)

*To all whom it may concern:*

Be it known that I, CLYDE J. COLEMAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Refrigerating Apparatus, (Case D;) and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming a part of this specification.

The present invention relates to that type of refrigerating apparatus in which positive means are employed to withdraw the expanded refrigerant medium from the expansion or cooling chamber and to force such expanded medium into the condensing or storage chamber to attain a continued cycle of operations in the system.

The object of the present improvement is to provide a simple, durable, and efficient means whereby the refrigerant medium is transferred from the expansion-chamber for continued reuse in effecting the cooling operation of the apparatus and in which a liquid seal is employed between the expansion and storage chambers of the system and which liquid is adapted to determine the degree of compression within such storage-chamber, the present invention involving also the actual transfer of the refrigerant medium through such liquid seal, all as will hereinafter more fully appear and be more particularly pointed out in the claims. I attain such objects by the construction and arrangement of parts illustrated in the accompanying drawing, which is a general elevation, partly in section, illustrating the preferred form of the present invention.

Referring to the drawing, 1 represents the storage or condensing coil or chamber; 2, the expansion-valve; 3, the expansion-chamber or coil in which the refrigerant medium is expanded to effect the cooling operation of the system, and 4 the compression apparatus by which the expanded refrigerant medium is taken from the expansion-chamber and forced or compressed into the storage-chamber, from which it is again expanded within the expansion-chamber in a closed and continuous cycle of operations.

The above-described members of a refrigerating apparatus or system are, in a broad sense, usual to the present type of refrigerating apparatus or system and may be of any well-known and approved construction and be connected together in any usual manner.

In the accompanying drawing, illustrative of the present invention, the outlet end of the compressing apparatus 4 is connected by pipe connection 5 with the condensing-chamber 1. The condensing-chamber 1 is connected to the expansion or cooling chamber 3 by a pipe connection 6, in which is arranged the expansion-valve 2, and the expansion-chamber is in turn connected with the inlet end of the compressing apparatus by the return-pipe connection 7.

The present improvement in the above-described type of refrigerating apparatus involves, broadly, the combination, with a mechanically-operated pump, of any suitable description of a liquid seal arranged between the condensing and the expansion sides of the apparatus and also involves the actual passage of the refrigerant medium through such liquid seal.

In my preferred type of apparatus (illustrated in the drawing) the pump or compressor by which the expanded and attenuated refrigerant medium as it comes from the expansion-chamber is forced into the condensing-chamber in the required state of condensation or compression for reuse in effecting a continued cooling action of the apparatus will comprise a closed and vertically-elongated tank or casing 4, having an inlet-opening near its top having pipe connection 7 with the expansion-chamber, and a centrally-arranged compression-chamber 4' within the interior of the tank or casing, such inner chamber having an open bottom, a closed top, and an outlet connecting with the pipe connection 5 of the condensing or storage chamber 1. Within the chamber or tank 4 is arranged an endless series of buckets 8, supported by top and bottom spider or other suitably-formed wheels 9 9, one or both of which may act as drivers for the endless series of buckets and for such purpose have operative connection with any suitable source of motive power. In the described construction the chamber or tank will contain a ver-



tical column or body of mercury or other  
suitable liquid, the height of which will de-  
termine the degree of compression maintained  
upon the refrigerant medium within the con-  
5 densing or storage chamber of the apparatus,  
in that the succeeding volumes of the refriger-  
ant medium carried from the upper end of  
the main tank 4 and down through the liq-  
uid, mercurial, or other seal and discharged  
10 into the compression column or chamber 4  
will gradually displace such liquid seal from  
the interior of such compression-column into  
the outer chamber 4 to maintain differential  
columns in the two vertical chambers and  
15 the required degree of compression within  
the compression-columns and the condenser  
or storage chamber of the apparatus to which  
it is connected.

Having thus fully described my said inven-  
20 tion, what I claim as new, and desire to secure  
by Letters Patent, is—

1. In a refrigerating apparatus of the char-  
acter herein described, the combination with  
the condensing - chamber, the expansive  
25 chamber, and the compressor, of a liquid seal  
interposed between the expansion and com-  
pression ends of the apparatus and so ar-  
ranged as to constitute both a fluid column

adapted to determine the difference in pres-  
sure between the expansion and the storage 30  
chambers of the system and a fluid seal  
through which an actual transfer of the re-  
frigerant medium takes place, substantially  
as set forth.

2. In a refrigerating apparatus of the char- 35  
acter herein described, the combination with  
the condensing - chamber, the expansion-  
chamber, and the compressor, of a liquid seal  
interposed between the expansion and com-  
pression ends of the apparatus and so ar- 40  
ranged as to constitute both a fluid column  
adapted to determine the difference in pres-  
sure between the expansion and storage cham-  
bers of the system and a fluid seal through  
which an actual transfer of the refrigerant 45  
medium takes place, the said compressor com-  
prising a closed receiving-column, a compres-  
sion-column and an endless series of pump-  
buckets, substantially as set forth.

In testimony whereof witness my hand this 50  
4th day of September, 1899.

CLYDE J. COLEMAN.

In presence of—

ROBERT BURNS,  
M. H. HOLMES.