

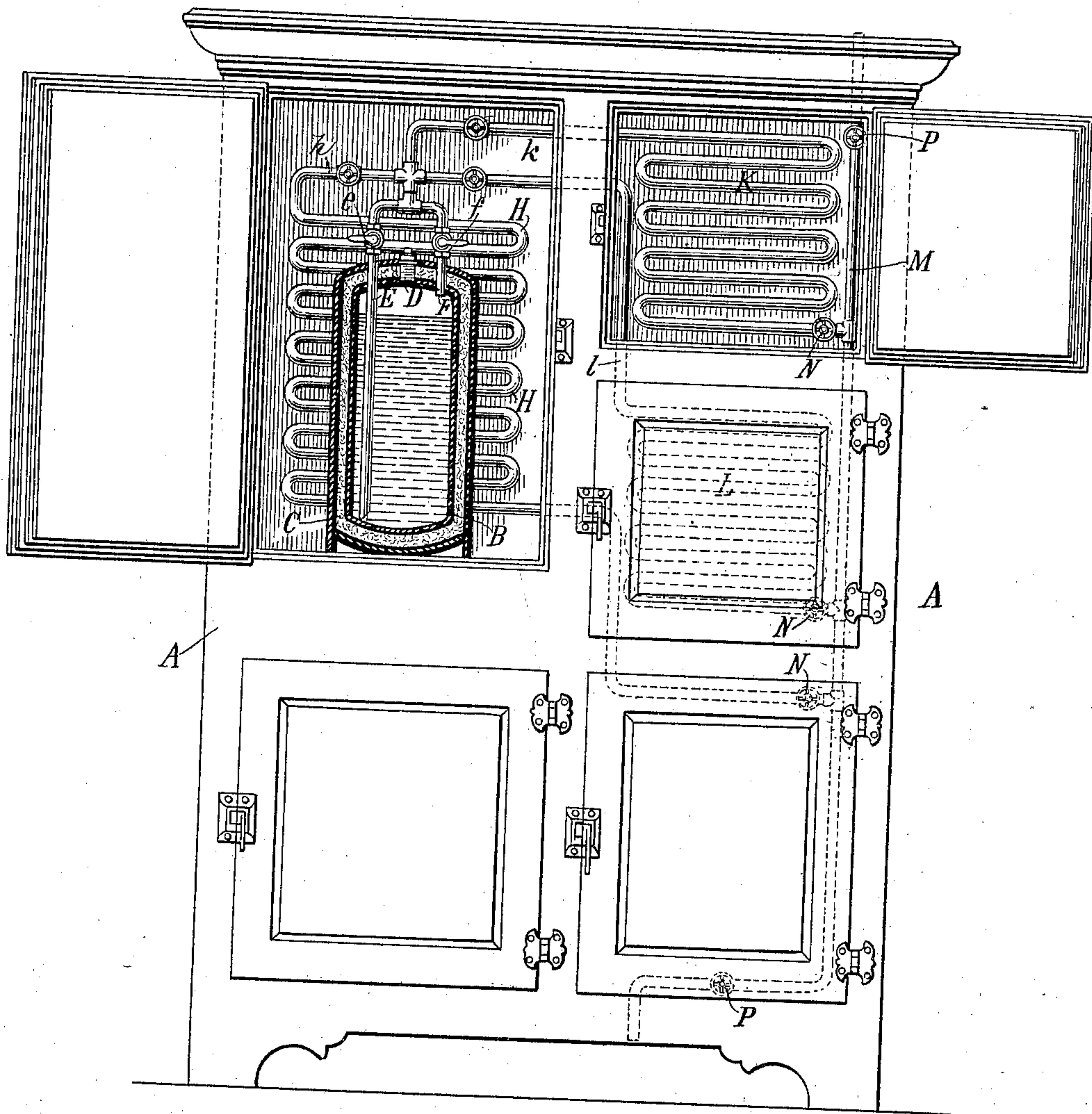
No. 672,257.

Patented Apr. 16, 1901.

G. A. BOBRICK,
REFRIGERATOR.

(No Model.)

(Application filed Nov. 8, 1900.)



Witnesses:

Raphaël Ketter

M. Lawson Dyer

by

Gabriel A. Bobrick ^{Inventor}
Herr. Page Cooper ^{Attys}

UNITED STATES PATENT OFFICE.

GABRIEL A. BOBRICK, OF LOS ANGELES, CALIFORNIA.

REFRIGERATOR.

SPECIFICATION forming part of Letters Patent No. 672,257, dated April 16, 1901.

Application filed November 8, 1900. Serial No. 35,878. (No model.)

To all whom it may concern:

Be it known that I, GABRIEL A. BOBRICK, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Refrigerators, of which the following is a specification, reference being had to the drawing accompanying and forming a part of the same.

10 The invention which forms the subject of my present application for Letters Patent is an improved means or apparatus for utilizing liquefied air or other gases for purposes of refrigeration, the special object being to provide a practical and economical refrigerator for hotels or private uses to take the place of the so-called "ice-boxes" heretofore in general use. Such being the main intent and purpose of the invention, it will be understood at the outset that the form of the refrigerator, the number or arrangement of its general compartments, and the specific purpose for which it is designed are largely matters of choice. The improvement will therefore be illustrated as applied to an ordinary household-refrigerator.

30 The drawing is a front elevation of such a device, two of the doors being open to exhibit the construction and arrangement of the essential parts of the refrigerating apparatus in which the invention resides.

35 A is the outer box or case, divided into the usual compartments. In one of the upper compartments is located a closed receiver B for containing liquid air or other gas. This receiver is inclosed in a jacket C, of mineral wool or other insulating material, to exclude external heat as far as practicable and is provided with a screw-plug D, by the removal of which the desired quantity of liquefied gas may be introduced.

45 Two pipes E and F lead from the interior of the receiver, the first-named extending down to the bottom, so that its end will always be below the level of any liquid contained therein, while the other opens near the top of the receiver. Each of said pipes contains a controlling or gate valve *ef*, beyond which the two pipes unite in a single pipe. If the capacity of the refrigerator be small, this latter pipe leads direct to a single coil; but generally there will be several compartments,

and it is desirable to have a coil in two or more of them. This arrangement is therefore shown, H K L representing coils in several of the compartments. From the main pipe, formed by the union of pipes E and F, extend branches *h k l* to the said refrigerating-coils, each branch leading, preferably, to the uppermost point of the coils, the lower ends being connected with an exhaust or outlet pipe M.

Suitable gate-valves N are placed in the several branches and other valves P in the several outlets in order that each coil may be included in or cut out of the circuit for the refrigerant, according to need.

When the receiver B is filled or partially filled with a liquefied gas, such as liquid air, and the valves properly adjusted, any temperature from approximately that of the atmosphere to one many degrees below freezing may be maintained in the interior of the device as long as any liquid remains in the receiver. This result is due to causes which will be understood from the following considerations: If the natural evaporation due to the absorption of heat from the atmosphere by the receiver and its contents be depended upon alone, little or no useful result will be secured. There will of course always be some evaporation of the liquid in the receiver, however carefully the latter is insulated; but this evaporation is utilized for forcing the liquid up from the receiver through the system of pipes at a rate just sufficient at all times to maintain the temperature of the compartments in which the coils are contained practically uniform. In order to secure this result, the valves *e* and *f* are so adjusted that the gas which accumulates in the upper portion of the receiver cannot all escape freely through the pipe F, but produces sufficient pressure within the receiver to force a small quantity of the liquid up through the pipe E. This liquid circulating in the pipes and coils contained in the several compartments takes up heat from the surrounding atmosphere after the walls of the compartments have been cooled, is expanded, and passes off through the outlet provided for its escape.

The outlet-valves will be adjusted to control the pressure in the refrigerating pipes and coils, so that the rate at which the liquid

is evaporated will be very closely in proportion to the amount of heat which it is necessary to absorb in order to maintain the temperature at a given uniform point. The consumption of liquid therefore will be due to the normal evaporation in the receiver, and that automatically effected in the coils will be very slow after the walls and interior spaces of the refrigerator have once been cooled.

10 What I claim is—

1. A refrigerating device comprising in combination, a closed receiver for containing the liquefied gas, one or more expansion-coils, connections from the receiver to said coils, one
15 connection being from above and the other from below the level of the liquid contained in the receiver, the last-named connection being adapted to permit the transfer of liquid from the receiver to the expansion-coils only
20 when the pressure in the receiver exceeds that in the expansion-coils, and controlling-valves in both connections, as set forth.

2. The combination in a closed receiver for containing liquefied gas, of a refrigerating
25 coil or coils, pipes leading from the receiver to said coil or coils, one pipe leading from above the level of liquid in the receiver and the other from below, but extending to a point

above said level and controlling-valves in each of said pipes, as set forth. 30

3. The combination with a closed receiver for containing liquefied gas, of a refrigerating coil or coils, pipes leading from the receiver to said coil or coils, one pipe leading from above the level of the liquid in the receiver, and the other from below, but extending to a point above said level, controlling-valves in both of said pipes, and similar valves in the outlets of the refrigerating-coils, as set forth. 35 40

4. The combination in a refrigerator of refrigerating-coils located in one or more of the compartments therein, a receiver for liquefied gas, connections from the receiver to the said coils, one connection leading from above the level of liquid in the receiver, and the other from below, but extending to a point above said level, controlling-valves in both of said connections and means for connecting and disconnecting any of the refrigerating-coils, 45 50 as set forth.

GABRIEL A. BOBRICK.

Witnesses:

DRURY W. COOPER,
M. LAWSON DYER.