(No Model.)

# G. KOONS.

## REFRIGERATOR.

No. 302,500. Patented July 22, 1884.

Fig. 1.

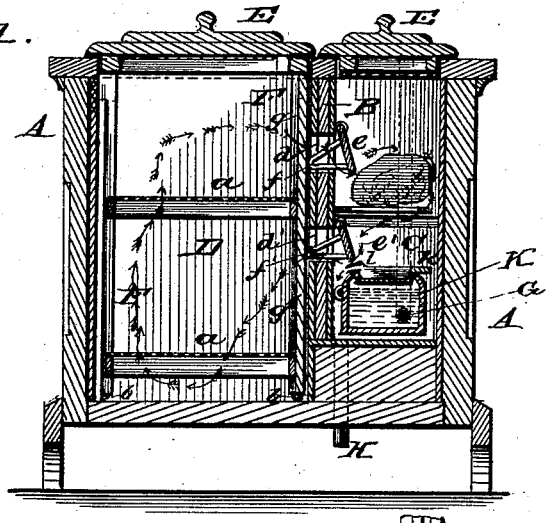



Fig. 2.

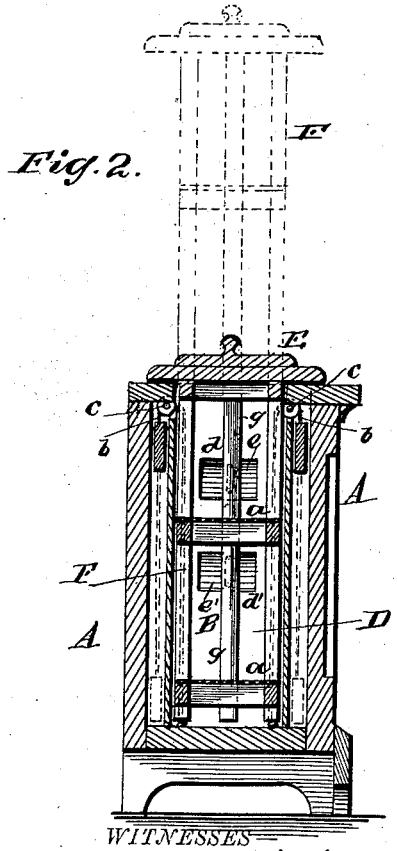



Fig. 4.

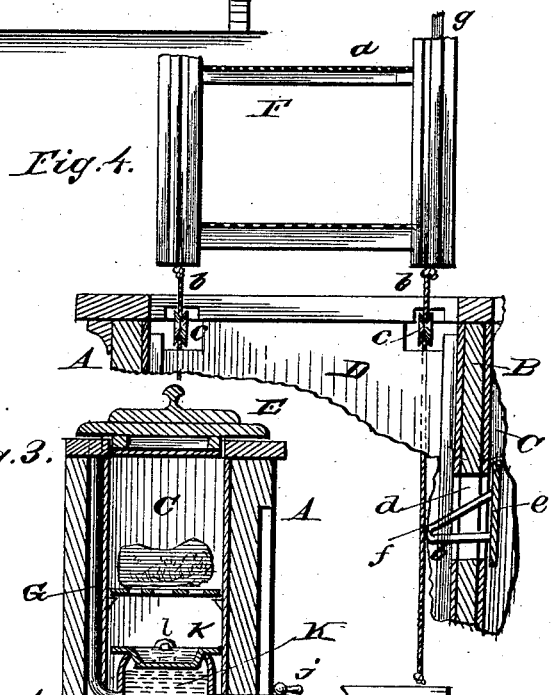
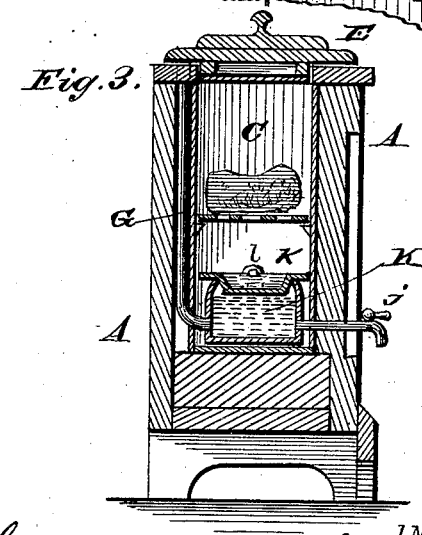



Fig. 3.




WITNESSES

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# UNITED STATES PATENT OFFICE.

GEROW KOONS, OF ST. LOUIS, MISSOURI.

## REFRIGERATOR.

SPECIFICATION forming part of Letters Patent No. 302,500, dated July 22, 1884.

Application filed May 1, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, GEROW KOONS, of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Refrigerators; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification, in which—

Figure 1 is a longitudinal vertical sectional view of my improved refrigerator. Fig. 2 is a vertical cross-section through the same, indicating the shelving-frame inclosed inside of its compartment in full lines and raised to its full limit in dotted lines. Fig. 3 is a vertical transverse section through the ice-compartment and water-cooler. Fig. 4 is a longitudinal sectional view of details, the cage of shelving being elevated.

This invention relates to portable refrigerators; and it consists in certain novel improvements on such refrigerators, whereby I dispense with the doors or passages through the vertical sides of the box or case, and also whereby I obtain a rotary circulation of dry and pure cold air through the refrigerating-compartment, and, finally, whereby I cool drinking-water by the drippings of the ice, and prevent warm air from entering the ice-chamber when the shelving-frame is raised, all of which will be fully understood from the following description, when taken in connection with the annexed drawings. The box or case A of the refrigerator has solid vertical sides and bottom—that is to say, I have no doors or openings, which in the best-constructed refrigerators always more or less admit warm air. The interior of the case A is divided by a vertical partition, B, into two compartments, C and D, one of which is metal-lined and adapted to contain ice, and the other, which is also lined with any suitable material, contains the articles to be refrigerated. Each one of the compartments C D is provided on top with a door or cover, E, which should be hermetically sealed when shut. The space between the double walls of the case may be filled with any suitable substance which is a poor conductor of heat.

F designates a vertically-movable cage or frame, which is provided with reticulated or perforated shelves *a*, and which is allowed to be moved vertically between suitable guides. To the bottom of the said movable frame F, at its four corners, I secure ropes or chains *b*, which pass over pulleys *c* near the upper end of the compartment D, and have weights attached to their ends, the object of which is to balance the frame F, and thus allow it to be easily raised and lowered.

To prevent the suspension ropes or chains *b* from binding between the corner uprights of the frame F and the sides of the compartment D, I make grooves in said uprights, or in guides, to freely receive said ropes or chains.

Near the upper and lower ends of the partition B are passages *d d'*, which are provided with gravitating valves *e e'*, hung from their upper edges, and arranged on the ice-chamber side of the said partition B. These valves *e e'* are provided with projections *f f'*, which extend into the refrigerating-compartment D far enough to be acted on by a vertical bar, *g*, of the shelf-frame F, which opens and holds open the valves when this frame is down, as indicated by full lines, Fig. 2. When the frame F is raised to its full height, both valves *e e'* will shut by their own gravity and prevent warm air from entering the ice-compartment C.

It is important to have two openings, *d d'*, through the partitions B, arranged about as I have shown in Fig. 2, for the reason that I must have a complete circulation of air in the refrigerator, as indicated by the course of the arrows. The warmer air is thus caused to descend through the ice-compartment C, where it is cooled, dried, and purified, in which condition it will rise through the shelves of the frame F, refrigerate and keep pure the articles thereon, thence pass back again into the chamber C. I thus keep up a constant rotation and circulation of the air.

At the bottom of the ice-compartment C is a tank, K, for containing drinking-water, which tank is provided with a tightly-fitting cover, *k*, which is deeply depressed or dished and constructed with an outlet or overflow, *l*. This tank is supplied with water through a pipe, G, leading to the top of the refrigerator, and it is provided with a cock, *j*, for drawing off the water. An overflow-pipe, H, leads

from a point above the bottom of compartment C, outside of the same, for carrying off the ice-drippings.

It will be observed that the water-tank K will be kept surrounded by cold water—*i. e.*, the ice-drippings; also, that the cover of this tank is kept full of cold water, which can overflow without entering the tank.

Having described my invention, I claim as new—

1. A portable refrigerator-case having solid vertical sides and bottom, in combination with an internal partition having two passages provided with trap-valves, a vertically-movable open frame or shelf-cage adapted to open said valves, and an ice-chamber, all constructed and adapted to operate substantially in the manner and for the purposes described.

2. The combination, with the ice-compartment C of the refrigerator, of a water-tank having a tightly-fitting dished cover provided with an overflow, *l*, above its bottom, said tank being located at the bottom of said compartment, and the latter being provided with an overflow-pipe, H, extended above the bottom thereof, substantially as described.

3. A refrigerator having openings only at its top, in combination with a partition having trap-valves, a vertically-movable balanced frame or cage, an ice-compartment, a cold-water tank at the bottom thereof, and a feed-pipe leading outside of the said compartment, all constructed and adapted to operate substantially in the manner and for the purposes described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

GEROW KOONS.

Witnesses:

EDWARD A. DRURY,

LAURENCE W. LOW.