This invention relates to refrigerators for cooling by brine and has for its object to provide a simple and efficient refrigerator of this kind.

In known refrigerators operating on the cold brine shower system, perforated horizontal partitions in a refrigerating chamber for allowing cold brine shower are not arranged so as to always contain some cold brine on the partition and allow rapid circulation of cold brine. The cold brine shower can not, therefore, be continuous and uniform throughout the whole area of each partition, and accordingly the refrigerating effect is inefficient, so that the refrigerators of this kind are not in general use.

According to this invention each partition is formed as a perforated tray provided with one or more overflow openings which are raised above the level of the tray so that the brine must accumulate to a certain depth on the tray before it can overflow on to the next tray below, and means are provided for ensuring that brine overflowing from an upper tray cannot pass directly into the overflow opening or openings of the next tray below. Thus in addition to the shower of brine falling continuously on to an article in one tray through the perforations in the tray above there is a continuous circulation of brine over the bottom of the articles and efficient refrigeration is ensured.

The invention will be better understood by reference to the accompanying drawing in which:

Fig. 1 is an elevation, partly in section, of a refrigerator according to the invention.

Fig. 2 is a vertical section of a modification of the refrigerator.

Fig. 3 is a vertical section of another modification of the refrigerator, partition trays being partly removed.

Fig. 4 is a vertical section on line IV—IV of Fig. 3.

Fig. 5 is a perspective view of a frame for supporting a partition tray.

Referring now to the drawing, a refrigerating chamber 1 is divided into several compartments 2 by means of horizontal partition trays 3. The top compartment and the bottom compartment may be used for a refrigerant inlet space and a refrigerant outlet space respectively, whilst the intermediate compartments may be used for storage spaces. Each compartment for storage space may be provided at one side with a water-tight door for access of articles, said door being indicated at 4 in Fig. 1 and being hinged and adapted to be tightly closed by means of bolts 5 and wing nuts 6 by way of example. Cold brine for refrigerant is delivered into the refrigerating chamber 1 at its top through a delivery pipe 7 from a source (not shown) and is discharged at the bottom to a discharge pipe 8 leading to the source or any suitable place.

Each partition tray 3 is provided with a number of small perforations 9 uniformly disposed throughout the whole area, through which cold brine is allowed to shower, and is also provided adjacent a side wall or side walls of the refrigerating chamber 1 with one or more openings 10 for overflow of superfluous cold brine which is more than the perforations can allow to pass through. The part 11 of the partition tray 3, where the opening 10 is formed is raised up to suitable height as seen in Figs. 1 and 2, so that cold brine may be contained in the partition tray up to the level according to the height of the raised part 11 having the opening 10. Suitable provision is made for the arrangement of the opening in such position as to prevent cold brine flowing downwards through the opening from passing by the compartment directly under the opening without flowing in the next partition tray. In Fig. 1, the openings 10 are arranged at opposite ends in two consecutive partition trays. In Fig. 2, suitable deflectors as indicated at 12 and 12' are provided below the openings, whereby the cold brine is deflected laterally so as to flow in the next partition tray, without making direct communication with the openings of the next partition tray.

Fig. 3 illustrates a modification of the invention which is designed for enabling the partition trays to be adjusted so as to be always maintained in horizontal position when a ship such as fishing boat equipped with a re-
frigridator according to the invention lists to
one side due to unbalanced loading of cargo on
board to cause the partition trays in the
refrigerating chamber to incline from their
horizontal position.

In Fig. 8, rear supports 13 consisting of
plate like members for carrying frames 14
for supporting the partition trays are at-
ached at either side of the refrigerating
chamber and adjacent the back wall of the
chamber, and are provided with a number of
lateral pins 15 arranged in pairs and pro-
jecting horizontally and inwarlly in opposite
direction for pivotally carrying the rear ends
of the frames for supporting the partition
day.

Front supports 16 consisting of plate like
members for carrying the frames for sup-
porting the partition trays are arranged for
vertical adjustment at either side of the re-
frigerating chamber and near the front wall
of the chamber. The plate-like supports 16
are provided with a number of lateral pins 17
arranged in pairs and projecting horizontally
and inwarlly in opposite direction for carry-
ing the front ends of the frames 14 and slots
18 for receiving lateral guide pins 19 secured
to the side walls of the refrigerating chamber.

To the upper end of the front supports
are welded rods 20 which extend upwardly
through the top wall of the refrigerating
chamber. To the upper ends of these rods
is connected a bar 21 having at its middle
point a threaded hole 22 for receiving a screw
23 carrying a handle 24 which is suitably
mounted on the top of the refrigerating cham-
ber.

Each frame 14 for supporting the parti-
tion tray is built up of angle bars as shown
in Fig. 5 and is provided with angle pieces
25 attached under the rear ends of side angle
members 14' and having slots 26 for receiv-
ing the rods 15. The frames 14 are carried
on the front and rear support plates 13, 16
with the rear ends resting on the pins 15 en-
gaging with the slots 26 of the angle pieces 25
and with the front ends resting on the pins
17. With this construction, the front sup-
port plates 16 can be moved vertically by
means of the handle 24 and accordingly the
partition trays on the frames 14 can be ele-
vated or lowered at the front end to main-
tain the partition trays in horizontal position,
when the refrigerating chamber becomes
inclined.

The articles to be stored are preferably put
on suitable spacers 27 arranged on the par-
tition tray, so that cold brine may freely cir-
culate under the articles.

In order to facilitate the inspection of the
interior of the refrigerating chamber, suit-
able lamps and peep holes (not shown) are
preferably arranged in the walls of the re-
frigerating chamber in known manner.

From the foregoing, it will be seen that the
invention provides an improved refrigerator
of cold brine shower system, whereby the
continuous uniform shower and rapid circu-
lation of cold brine can be ensured, so that
the efficiency of the refrigeration is consid-
erably improved.

Having now particularly described and
ascertained the nature of my said invention
and in what manner the same is to be per-
formed, I claim:

1. A refrigerator of cold brine shower

2. A refrigerator according to claim 1,

3. A refrigerator according to claim 1,

In testimony whereof I affix my signature.

ZENPEI OGURA.