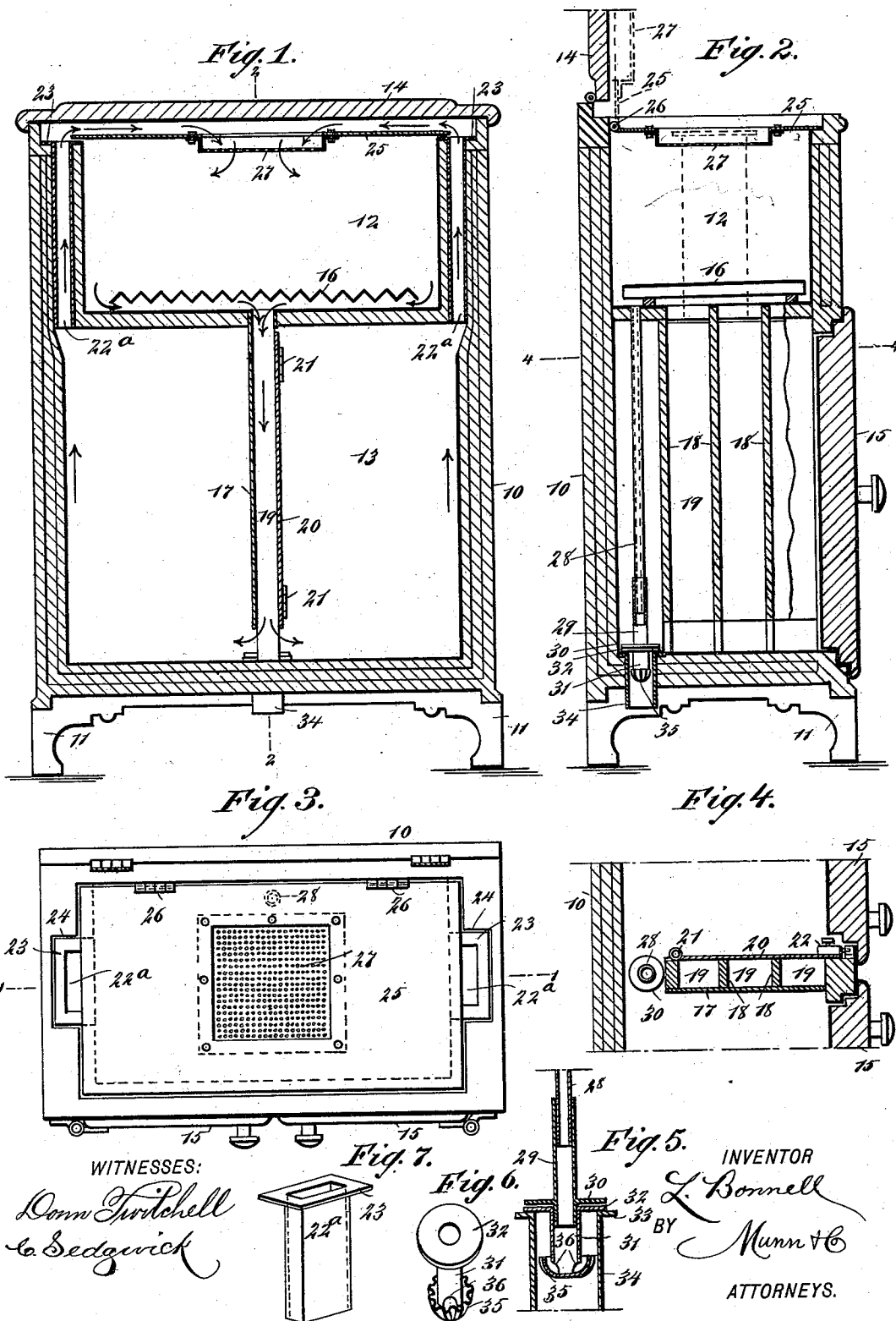


(No Model.)

L. BONNELL.
REFRIGERATOR.

No. 506,097.

Patented Oct. 3, 1893.



UNITED STATES PATENT OFFICE.

LANSING BONNELL, OF NEW YORK, N. Y.

REFRIGERATOR.

SPECIFICATION forming part of Letters Patent No. 506,097, dated October 3, 1893.

Application filed December 17, 1892. Serial No. 455,493. (No model.)

To all whom it may concern.

Be it known that I, LANSING BONNELL, of the city, county, and State of New York, have invented a new and Improved Refrigerator, of which the following is a full, clear, and exact description.

My invention relates to improvements in refrigerators. It is well known that all refrigerators, when in use, generate offensive gases which are carried from the provision chamber to the ice chamber and out through the drain pipe, and these gases in passing from chamber to chamber and through the discharge pipe, cause the several flues and pipes of the refrigerator to be coated with matter, which keeps the refrigerator foul to a certain extent, and it is therefore a menace to health and an injury to delicate foods. As refrigerators are usually constructed, it is a very difficult matter to clean these flues, and the object of my invention is to produce a refrigerator in which the several flues and the discharging pipe may be readily removed or thrown open so that they may be thoroughly cleaned, also to construct and arrange the flues so that the refrigerator will work well temporarily while the flues are removed for cleansing, and further to produce a refrigerator having its several flues and parts constructed in a way to promote rapid and perfect circulation, to the end that the refrigerator may be kept very cool with a comparatively small consumption of ice.

To this end my invention consists in certain features of construction and combinations of parts, as will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a central vertical section on the line 1—1 in Fig. 3. Fig. 2 is a central cross section of the refrigerator on the line 2—2 in Fig. 1. Fig. 3 is a plan view of the refrigerator with the cover removed. Fig. 4 is a broken sectional plan on the line 4—4 in Fig. 2. Fig. 5 is a detail longitudinal section of the trap. Fig. 6 is a detail perspective view of the trap basin and its connected pipe; and Fig. 7 is a perspective view of one of the detachable flues at the end of the ice chamber.

The refrigerator proper, that is, the case 10, may be of any approved form and it stands upon suitable feet 11, is provided with the usual ice chamber 12 in the top, the provision chamber 13 beneath it, the swinging cover 14 for the ice box, and outwardly swinging doors 15 to close the provision chamber. These features are common to all refrigerators and form no part of my invention. The ice chamber is also provided with the usual ice rack 16, and leading downward from the bottom of the ice chamber to the lower portion of the provision chamber is a plurality of parallel flues, these being formed by the main transverse partition 17 and the short parallel partitions 18 which are arranged at right angles to the partition 17, as shown in Fig. 4. These flues 19 are closed on one side by a swinging door 20 which is hinged at its inner edge, as shown at 21, and is provided at its outer edge with a catch or fastening 22, which may be of any suitable kind. By having a plurality of flues instead of one, the cold air descends from the ice chamber in divided currents and is freely distributed in the provision chamber, thus providing for an efficient cooling of the chamber and the maintenance of an even temperature therein. Where only one flue is used, the air current has a tendency to draw to the center of the flue and issues in a solid volume below. By providing the flues with the door 20 they may all be thrown open by simply opening the door and their exteriors exposed so that they may be conveniently and thoroughly cleaned.

The warmer air in the provision chamber rises through the detachable metallic flues 22^a at the ends of the ice chamber and returns beneath the cover 14 to the upper portion of the ice chamber, as described below and as indicated by the arrows in Fig. 1. It will be noticed that the ice chamber is entirely closed at the ends and sides, and its walls abut with the walls of the refrigerator case, while the flues 22^a fit snugly in recesses 24 in the end walls of the case and are prevented from dropping too far down by the flanges 23 at their upper ends. These flues 22^a may be conveniently lifted out of the recesses 24, when they are to be cleaned, and during their absence the air will pass up through the recesses 24, and the working of the refrigerator will be

in no wise interfered with. It will be understood that these detachable flues may be arranged at either the ends, corners, or sides of the ice chamber without departing from the principle of my invention, and any desired number of them may be used according to the size of the refrigerator.

A space is left between the top of the ice chamber 12 and the cover 14 for the return currents of air which rise through the flues 22^a, and the ice chamber is covered by a swinging lid 25, which has in the center a depressed condenser or condensing box 27, which is of metal, and which is profusely perforated. The swinging lid being metal, will become cold from the ice under it. This, in connection with the condensing box, will cause the air to become much colder than it was when it left the provision chamber, and when the air currents strike this perforated plate which forms the bottom of the condensing box, they are sub-divided so that the air returns to the ice box in a multitude of extremely small and slow currents, and the air is thus very quickly cooled, and is prevented from rapidly wearing away the ice.

A drain pipe 28 is arranged in substantially the usual way and extends from the ice chamber to a point near the bottom of the provision chamber, and at this point it enters a sleeve 29 which may be moved up and down on the pipe, and which has a base flange 30 which holds it in place. The lower end of the sleeve projects below the flange, as shown in Fig. 5, and enters the trap pipe 31, which pipe has an annular flange 32 at the top, adapted to rest on the flange 33 of the discharge pipe 34, which pipe extends downward through the floor of the refrigerator. The trap pipe 31 has formed on its lower end a basin 35 into which it opens through ports 36, and the top of the basin is higher than the tops of the ports, so that the ports will always be submerged and no warm air can get into the refrigerator through the same.

The basin, the ports, and the pipe 36 are of substantially the usual kind, but the arrangement of the parts is new, the object being to provide for the easy cleaning of the trap. To do this, it is only necessary to push up the sleeve 29, then remove the trap pipe 31 in the basin for cleansing. When the pipe 31 is removed, the sleeve 29 may be dropped and the flange 30 will rest on the flange 33 so that the drainage will pass off as well as if the trap were in place. The pipe 34 may also be removed when necessary.

From the foregoing description, it will be seen that every flue and air discharge, as well as the trap, may be easily removed or thrown open for inspection and cleaning, and conse-

quently every part of the refrigerator may be kept sweet and clean. It will also be observed that the arrangement of the several parts of the refrigerator provides for a constant circulation of air, and an even distribution of the cold air which passes downward from the ice chamber.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a refrigerator having an upper ice chamber and a lower provision chamber, the detachable flues arranged at the sides of the ice chamber, and adapted to conduct the air from the provision chamber to the ice chamber, substantially as described.

2. The combination, with the refrigerator having an upper ice chamber, a lower provision chamber, recesses in its walls opposite the ice chamber, and a space for the passage of air between the top of the refrigerator and the ice chamber, said space leading into the ice chamber, of detachable flues held in the recesses of the refrigerator, substantially as described.

3. The combination, with the refrigerator having an ice chamber in the top, a provision chamber below it, an air space above the ice chamber, and flues leading from the provision chamber to the air space, of a lid or cover for the ice chamber, having a depressed condensing box with a perforated bottom therein, substantially as described.

4. The combination, with the refrigerator having the usual ice and provision chambers, of a drain pipe extending from the ice chamber to a point near the bottom of the provision chamber, a discharge pipe extending through the refrigerator bottom beneath the drain pipe, a detachable trap arranged within the discharge pipe, and a sliding sleeve mounted on the lower end of the drain pipe and adapted to deliver into the trap, substantially as described.

5. The combination, with the refrigerator having the usual ice and provision chambers, of a drain pipe leading from the ice chamber to a point near the bottom of the provision chamber, a detachable discharge pipe arranged in the floor of the refrigerator beneath the drain pipe, a detachable trap arranged within the discharge pipe, and having a flange to overlap the top of the discharge pipe, and a sliding sleeve mounted on the drain pipe and delivering into the trap, the sleeve having an annular flange at its lower end, substantially as described.

LANSING BONNELL.

Witnesses:

C. SEDGWICK,
EDGAR TATE.