

ROBERTS v. RYER.

[11 Blatchf. 11; 6 Fish. Pat Cas. 293; 3 O. G. 551.]¹

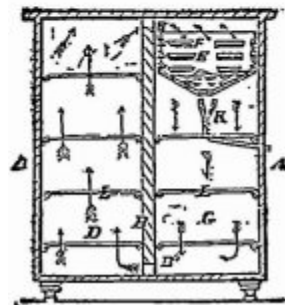
Circuit Court, S. D. New York. March 18, 1873.²

PATENTS—NOVELTY—REISSUE—COMBINATION—REFRIGERATORS.

1. The reissued letters patent granted, April 21st, 1857, to D. W. C. Sanford, for an "improvement in refrigerators," and extended, October 20th, 1869, for seven years from the 13th of November, 1869, the original patent having been granted to Sanford as inventor, November 13th, 1855, are void, for want of novelty.
2. The first claim of such reissue is a claim to a combination of three elements: (1) An open-bottomed ice-box, constructed in such manner that, by the perforation of holes in the sides and bottom of the box, the air will pass freely down through, and in contact with, the ice in the box, so that it can fall directly from the ice upon articles to be refrigerated; (2) a dividing partition, open above and below, so placed in relation to such ice-box that, by means of self-operating internal circulation, in a closed refrigerator, the whole of the contained air shall be kept in motion, and caused to revolve around such partition, in currents moving downwards only on one side of such partition, and upwards only on the other side; (3) a chamber for the refrigeration of food or provisions, placed directly under the ice-box, whether there are shelves or fixtures, in such chamber, to hold the articles in the descending current directly under the open-bottomed icebox, or whether such articles are placed in such current, in such chamber, directly under the open-bottomed ice-box not by means of shelves or fixtures placed there, but by being suspended there, or placed on the floor, or otherwise kept in position.
3. The second claim of such reissue is a claim to a combination of three elements, namely, the first and third elements of the first claim, combined with the described arrangement for carrying off the water, whereby the cold air can fall directly down upon articles to be refrigerated, while the water is prevented from dripping into the apartment.

4. The invention of Azel S. Lyman, set forth in his caveat, filed August 20th, 1852, and perfected by him prior to 1855, and described in his application for a patent, of September 21st, 1854, and covered by the patent granted to him March 25th, 1856, embraces everything claimed in the reissued patent of Sanford.

³[Final hearing on pleadings and proofs. Suit brought [by George C. Roberts against William P. Ryer] on letters patent [No. 13,802] for "improvement in refrigerators," granted to D. W. C. Sanford, November 13, 1855; reissued April 21, 1857 [No. 455]; extended for seven years from the expiration of the original term, and assigned to complainant.



[Fig. 1 in the accompanying engraving is a perspective view, exhibiting the interior of the improved refrigerator, as shown in the reissued letters patent Fig. 2 is a vertical middle section of the same. The parts and the operation of the refrigerator are described by words and letters of reference in the

portion of the specification quoted in the opinion of the court, in which the claims will also be found.]³

Thomas A. Jenckes and Barrett & Redfield, for plaintiff.

Frederick H. Betts, Joseph Outman, Jr., and James N. Piper, for defendant.

BLATCHFOED, District Judge. This suit is brought on reissued letters patent granted, April 21st, 1857, to D. W. C. Sanford, for an "improvement in refrigerators," the original patent having been granted to Sanford, as inventor, November 13th, 1855, and the patent, as reissued, having been extended October 20th, 1869, for seven years from the 13th of November, 1869. The reissued patent has three figures of drawings, which are referred to in the specification annexed to it, figure 1 being "a perspective view, exhibiting the interior of the refrigerator," figure 2 "a vertical middle section," and figure 3 "a perspective of a smaller-sized refrigerator, with one of the apartments contracted." The specification says: "My invention consists of an improvement in refrigerators, whereby the whole of the contained air is kept in continual rotation, purification, desiccation, and refrigeration, and with economy of ice. The circulation of the air of my refrigerator is entirely confined, and consists of a continuous movement or rotation of the air confined within the apartment, without any communication with the external air, except when it becomes unavoidable from opening the refrigerator. I have found, for purification, that external air is not necessary, and it is obvious, that any arrangement by which a current of external air, after being cooled, is passed through the refrigerator, must be attended with a great consumption of ice, and that any arrangement which admits of stagnation of air in any part of the refrigerator, and does not compel circulation of air throughout the entire apartments, is highly

objectionable. Both of these conditions I have avoided, as will be seen from the following description." Then follows the description, with reference to the drawings. Within a suitable casing a partition is inserted, with an opening over the partition, at its top, and an opening under it, at its bottom, so that there is free communication between the two apartments formed by the partition. The drawings show the partition as being vertical, and the openings as being of little vertical height. At a high point in one of the apartments an ice receptacle is placed. This receptacle is perforated on the sides and bottom, so as to allow free passage of air through, and in contact with, the ice. The ice is prevented from coming into contact with the sides of the receptacle, by projections indicated, which, in this case, are stated to be made by punching the holes in such a way that a portion of the metal is protruded. The bottom of the ice receptacle is funnel-shaped, so as to conduct the water of the melting ice to a central discharge, whence it falls into the cup or flaring end of an escape pipe, which passes directly out through the side of the refrigerator. It is stated to be important that the escape pipe should occupy as little room as possible, in order not to obstruct the motion of the air. The shelves in the two apartments are perforated, to allow of the free transit of air. The apartment above which is the ice receptacle is designated as apartment C. The apartment on the other side of the partition is designated as apartment D. The opening at the top of the partition is designated as B', and the opening at its bottom as B". The specification then proceeds: "When the ice is placed in its receptacle, and the refrigerator closed, the whole of the contained air will be set in motion, and continue to circulate or revolve as long as there is any ice, or refrigerating material, in the receptacle. The operation is as follows: The denser air in contact with the ice and walls of the receptacle descends, and its place is immediately supplied with

warmer air from apartment ⁹¹⁴ D, through the opening B'. The denser air, descending through the entire apartment O, and passing through the opening B", keeps up a continual displacement of the whole of the contained air of the refrigerator. The apartment D has a higher temperature than apartment C, and the temperature varies, with a gradual rise from the time the air leaves the receptacle until it arrives at the upper part of apartment D. It is evident, that the rotation of the air will continue until the ice is melted, and an equilibrium of temperature takes place throughout the entire refrigerator. As the air passes through the apartments it imbibes moisture from fruits, vegetables, meats, and other articles, and, when it comes into contact with ice, its capacity for moisture is diminished by condensation, and the moisture is condensed upon the ice and passes off with the waste water. The circulating air thus being continually desiccated, every part of the apartments is kept from mould and dampness. The exhalations and odor of meat and other articles are also precipitated upon the ice with the condensed vapor, and thus the entire apartments are kept sweet. (It is well known that mould will not generate in a current of air, and it is known, that, when once formed, it propagates itself and spreads with rapidity. Therefore, if any one part of the refrigerator be out of the direct course of circulation, the air will stagnate there and develop mould, which will contaminate the whole apartment. The apartment D may vary in width, and it may be, as shown in figure 3, so narrow as to serve merely as a passage for the ascending current of air, the greatest benefit being always derived from the downward current in apartment C. I am aware, that various devices have long since been known for causing the internal circulation of air in apartments of houses and refrigerators, but I am not aware, that, in any instance, a complete and continued rotation, purification,

desiccation, and refrigeration of the whole of the contained air of a refrigerator has been compelled under the same arrangement as in my improvement. Therefore, what I claim, as my improvement in refrigerators, is the employment of an open-bottom ice-box, or equivalent thereof, in combination with a dividing partition, open above and below, so placed, that, by means of self-operating internal circulation, the whole of the contained air shall be kept in motion, and caused to revolve around this partition in currents moving downwards only on one side of this partition, and upwards only on the other side, when the same is combined with a chamber, for the refrigeration of food or provisions, placed directly under said ice-box, as set forth. I do not claim, by itself, a partition dividing vertically one compartment of a refrigerator from another, nor do I claim placing articles to be refrigerated in a descending current of air, but I do claim placing shelves, or fixtures, for holding articles to be refrigerated, or the articles themselves, in the descending current directly under an open-bottom ice-box, in combination with a dividing partition, open above and below, as set forth. I claim, in combination with said shelves or fixtures, so placed, constructing the open bottom of the ice-box in such manner that the air may pass freely down through the same, and fall directly from the ice upon the articles to be refrigerated, while, at the same time, the drip of the water is prevented, as set forth.)” The figures 1 and 2, in the figures of drawings in the reissued patent, represent the vertical partition as in the middle of the width of the refrigerator. Figure 3 represents the apartment C, under the ice receptacle, as occupying nearly the entire width of the refrigerator, and the apartment D as a mere flue, without shelves, and too narrow for any other use. Figure 1 represents the shelves in each apartment as constructed of parallel rods, each rod as long as the width of the apartment,

and parallel with the width of the refrigerator. There are, in figure 2, arrows, pointing vertically downwards, in apartment C, and vertically upwards in apartment D, indicating the course of the air.

In the drawings of the original patent, there are but two figures. In each of them, the vertical partition is in the middle of the width of the refrigerator. The shelves, in figure 1, are represented as, each of them, one-half of it, in a direction parallel with the width of the refrigerator, solid, and the other half of it, perforated with holes, and so arranged that each solid half has a perforated half immediately above it and a perforated half immediately below it, and each perforated half has a solid half immediately above it and a solid half immediately below it. There are, in both figures, arrows, representing the current of air as passing diagonally from one perforated part to another perforated part. The specification of the original patent, after its reference to the drawings, contains everything that is above set forth as contained in the specification of the reissue, and in the same words, with the exception of what is above put in [parentheses], as quoted from the reissue; and that is not found in the original specification. Instead of it, the original specification contains this language: "I am aware, that various modes have been tried and used for circulating air in refrigerators, but I am not aware that, in any instance, a complete and continued rotation, purification, desiccation, and refrigeration of the whole of the contained air in the refrigerator has been compelled, as it is in my invention, and I, therefore, claim the arrangement set forth, for causing the perpetual rotation of the whole of the air contained within the refrigerating apartments, said arrangement consisting, when the refrigerator is closed, of an endless passage or chamber, the walls, shelves, and ice receptacle of which are so 915 placed and constructed, that the air is compelled to circulate through the entire

apartment or apartments, and from which the water of the melting ice is discharged immediately from the refrigerator, instead of flowing between its walls, the whole being constructed as herein above set forth.”

It is apparent, from the language of the specification of the original patent, that Sanford, when he applied for his original patent, believed that he was the first inventor of any arrangement in a refrigerator, whereby there was effected a complete and continued rotation, purification, desiccation and refrigeration of the whole contained air in a closed refrigerator. He, therefore, claimed, in that specification, the use, in a closed refrigerator, of an endless passage, furnished with walls, shelves and ice receptacle, so placed and constructed, as to compel the perpetual rotation or circulation, throughout the entire apartment or apartments, of the whole of the air contained therein, with the provision described for the discharge of the water of the melting ice, the whole being constructed as set forth. The rotation of the air in a closed refrigerator, through the ice receptacle, was the great feature dwelt on by Sanford in the original specification. And the statement of the invention in that specification, and in the reissue, in the same words, shows, that, when applying for the reissue, the same idea was entertained by Sanford, namely, that he was the first person to make an improvement in refrigerators, whereby the whole of the contained air in a closed refrigerator should be kept in continual rotation, purification, desiccation and refrigeration, or, in other words, the first person to make such arrangement of icebox and dividing partition, that, by means of self-operating internal circulation, the whole of the contained air in a closed refrigerator should be kept in motion, and caused to revolve around the partition. This is further shown by Sanford's statement, made September 16th, 1868, and filed in the patent office October 7th, 1868, in his application

for the extension of his patent, in which he says, that he made his improvement because he had seen, in Schooley's refrigerator, a defect, in introducing external air, cooling it by the ice, and suffering it to escape, thus allowing a continuous stream of warm air to enter the refrigerator, and a stream of cold air to flow out of it, and wasting the ice; that he set himself to over-come such defect; and that he did so "by closing the external openings of Schooley's refrigerator, and making, instead thereof, an opening in the top of the partition, above the ice, so as to have a free communication from one side of the partition to the other, through the openings at the top and bottom of the partition, thus causing, by means of the ice, a continuous rotation of the air contained in the refrigerator, by which contrivance a lower temperature was produced with less consumption of ice, than when the air was allowed to escape as soon as it was cooled, as in Schooley's." The economy of ice necessarily follows from establishing the rotation of the air in the closed refrigerator, and that rotation is established by causing the air to rotate through the ice-box from top to bottom, and then down, and under the bottom of the partition, and then up, and over the top of the partition, and into the top of the ice-box again. In the rotation, the air is necessarily, by frequently coming into contact with, and passing through, the ice, purified, dried and made cold. The cooling of the air initiates the rotation, if there be an open bottom to the ice box, and a dividing partition open above and below. When the rotation has once commenced, it must continue, and the other consequences described must follow.

With this general view of the invention, we are prepared to consider what the reissue claims. There are but two claims, really, in the specification. The first claim is a claim to a combination of three elements: (1) An open-bottomed ice-box, constructed in such

manner, that, by the perforation of holes in the sides and bottom of the box, the air will pass freely down through, and in contact with, the ice in the box, so that it can fall directly from the ice upon articles to be refrigerated; (2) a dividing partition, open above and below, so placed, in relation to such ice-box, that, by means of self-operating internal circulation, in a closed refrigerator, the whole of the contained air shall be kept in motion, and caused to revolve around such partition, in currents moving downwards only on one side of such partition, and upwards only on the other side; (5) a chamber for the refrigeration of food or provisions, placed directly under the icebox, whether there are shelves or fixtures, in such chamber, to hold the articles in the descending current directly under the open-bottomed ice-box, or whether such articles are placed in such current, in such chamber, directly under the open-bottomed ice-box, not by means of shelves or fixtures placed there, but by being suspended there, or placed on the floor, or otherwise kept in position. The claim which immediately follows the two disclaimers is the same thing as the claim which precedes such two disclaimers, and must be read as an explanation of it. The second and last claim is a combination of three elements, namely, the first and third elements of the first claim, combined with the described arrangement for carrying off the water, whereby the cold air can fall directly down upon articles to be refrigerated, while the water is prevented from dripping into the apartment. This construction of the specification is that indicated in the case of *Roberts v. Harnden* [Case No. 11,903]. In that case, the partition, in the defendant's machine, did not extend downwards below the lower end of the side of the ice-box, and, 916 in fact, the side of the ice-box constituted the partition, and it was urged, that the defendant had no device or partition to keep separate the ascending currents and the descending

currents. But, the court held, that, so long as the general tendency of the air in the compartment containing and beneath the ice-box was downward, and the general tendency of the air in the other compartment was upward, the difference in the arrangement of the partition was not such as to relieve the defendant from the charge of infringement, it appearing that he extended the side of the ice-box downward far enough to perform the same function in substantially the same way, and to produce the same result, as the plaintiff's partition.

In the case of *Roberts v. Harnden* [supra], it is stated, that the novelty of the invention was denied by the answer. On that point, all that is said, in the decision of the court, is, that the defendant had not introduced any satisfactory evidence tending to show that the patentee was not the original and first inventor of what is described in the reissued patent as his invention. It is understood, that the principal defence relied on in that case was the alleged prior invention of one Thaddeus Fairbanks. An *ex parte* affidavit of Azel S. Lyman, made April 6th, 1864, with a drawing annexed to it, is shown, by the proofs in the present case, to have been introduced in evidence in the case against Harnden, on the point of a prior invention by Lyman, and to have been the only evidence introduced in that case on that point. That affidavit contains only a description of a refrigerating car, two of which it states were fitted up in 1853, under the direction of Lyman, and were used by him in July and August, 1853, in carrying oysters and a dressed sheep, by rail, from New York to Cincinnati, and in being loaded, near Columbus, Ohio, with dressed beef and lambs, and started for home. On the contents of that affidavit alone, no court could hold the Sanford patent to be void for want of novelty.

The defendant has a refrigerating room which he uses in his business as a butcher, and which is alleged

to infringe the plaintiff's patent. The room is 8 feet 3 inches long, 6 feet 2 inches wide, and 6 feet high. The ice-box, at one side, and in one corner, elevated, is 5 feet 10½ inches long, on the long side of the room, 3 feet 6½ inches high, and 2 feet 6½ inches wide. On the two sides of this ice-box which are towards the room, there is a space between the top of each of such sides and the ceiling of the room, of 8 inches in height, and the length of such two sides, for the ingress of the air of the room into the ice-box. A door from without opens into the ice-box, by which to put ice in. Another door opens into the room from without. The ice in the ice-box rests on a wooden rack in its bottom, which affords a free passage for air. Below the rack is a cold air-chamber, the roof of which is the bottom of the rack, and the bottom of which is formed by two inclines, which slope downwards, and towards each other, and towards a centre line midway of the width of the ice-box, so as to leave a central opening 5 feet 8 inches long and 2¼ inches wide, through which the cold air finds its way downward. The water from the melted ice falls on these inclines, and runs down them, and through this central opening, where it is caught by a trough 5 feet 10 inches long, and 6½ inches wide, and set 3½ inches below such central opening. This trough is 1 foot 8 inches above the floor of the room. There are no shelves below the central opening, but there is a rack on the floor, on which meat is placed. The water from the trough is conducted by a pipe out of the room. The room has been used in this way for more than nine years.

There can be no doubt that the defendant's refrigerating room contains, in combination, the three elements which are found in combination, as before explained, in the first claim of the plaintiff's patent, and that it also contains, in combination, the three elements which are found in combination, as before explained, in the second claim of the plaintiff's patent.

The heat given out by articles placed in the room warms the air, which then ascends and passes over the tops of the sides of the ice-box, and thus around the partition, and into contact with the ice, and is thus cooled and dried and purified, and descends through the open bottom of the icebox, and then through the central opening, and, descending further, according to the law governing the action of cooler air, displaces the warmer air, and pushes such warmer air before it, and upward around the partition, and so a rotation or circulation of the contained air in the closed room is established, which goes on so long as any part of the contained air is warmer than any other part of it. The cooled air can fall directly down upon such articles as are placed under the central opening, without being interfered with by, and without interfering with, the disposition of the water from the melted ice, and such water is carried off, and not allowed to drip into the room. The modes of operation of the combinations found in the defendant's room are the same as the modes of operation of the like combinations found in the claims of the plaintiff's patent.

The defence principally relied on, in this case, is, that, as to both of the combinations in the claims of the plaintiff's patent, he was anticipated by Azel S. Lyman, in inventions and structures previously made by Lyman, and that the defendant, in using a refrigerating room constructed and operating as above described, has done no more than he was fully instructed to do by such structures of Lyman.

The earliest date sought to be assigned to Sanford's invention is the summer of 1855. That date is the one given by him in his 917 statement, before referred to, filed in his application for extension, as the date previous to which he had paid no attention to the subject of refrigerators.

It is in evidence, that Lyman, on the 20th of August, 1852, filed, in the patent office, a caveat for

“improvements in railroad freight cars, for transporting fresh meats, and other articles, which require a very low temperature and pure air.” Such caveat contains a description, and drawings referred to therein. The object of the arrangement is stated, in the caveat, to be to transport dressed meats. The walls, sides and top of the car made double, and filled in with a bad conducting material, the car is closed, and the air in it is reduced in temperature, by passing it, in rotation and circulation, through ice, or other cooling material, contained in a box in the car, or through tubes immersed therein. A fan, driven by a cord from the axles of the car, drives the air down through the cooler. After the air leaves the bottom of the cooler, it passes through a box containing disinfecting material. The air is stated, in the caveat, to be preserved cool, pure and dry, by being passed frequently through the cooler and the disinfecting material, so as to keep the meats from putrefying, the moisture from the meat being deposited on the cold surface, and flowing down, and being caught in a pan below the bottom of the cooler, whence it is carried off, by a tube, to the outside of the car. The caveat states, that Lyman proposes to claim the providing for a constant circulation of air, from the car, through the cooler, and through the disinfecting-box, back into the car, by means of a fan, or some other similar mechanical arrangement; the drying of the air, by the precipitation and condensation of the water held by it in solution, by passing it through the cooler; the cooling of the air through the same process; and the construction of a cooling-house, or refrigerator, in the manner above described, except that there would be other arrangements for driving the fan.

Between the date of this caveat and the year 1855, Lyman constructed, and put into successful operation, refrigerating cars and stationary refrigerators, embodying the principle set forth in such caveat, and

constructed substantially on the plan therein stated, the cars being arranged with fans to assist in the circulation of the air, and the stationary refrigerators having no fans, but depending, for such circulation, on the law governing the movements of cooler and warmer airs, free to communicate with each other through an ice-box open above and below. All of these structures embodied the combinations and modes of operation before stated as found in common in the defendant's refrigerating room and in the plaintiff's structure.

In the summer of 1852, Lyman constructed a closed refrigerator, with the open-bottomed ice-box, the bottom of which was horizontal, and the dividing partition extending down no further than the lower end of the side of such box, and a charcoal filter on top of the ice-box. The water was conducted down two inclines, and fell into a pan on the floor of the refrigerator, and was thence carried, by a pipe, through the bottom. He used this refrigerator for some time, in his house in Brooklyn, N. Y., and, finding that the space under the ice-box, through which the water fell, was not utilized, he raised the pan up, and placed it as near to the cold air opening, and below it, as it could be placed, without interfering with the downward flow of the cold air. Under the pan, a wooden shelf was placed, to receive articles. Holes were bored through this shelf, for the passage of the air. The water passed from the pan, to the outside, by a pipe running through the side of the refrigerator. In this refrigerator, the opening between the lower edges of the inclines was a central one, as in the defendant's structure. Lyman used this refrigerator, as thus altered, for some time, in his family, placing the principal part of the food he wished to preserve on the shelf referred to, and under such shelf. In the fall of 1852, he put into it a new ice-box, the bottom of which, being open, sloped towards the interior. Below that was a single incline,

sloping towards the outside, to catch and conduct the drip. The opening through which the cold air went down was at the side, and not central, and a flange, raised around the edges of the opening, carried the water around the opening, and it was discharged, by a lead pipe, to the outside. Thus the pan was dispensed with. The shelf below the opening remained as before, and so did the charcoal filter above the ice-box. In the summer of 1853, Lyman had a number of these ice-boxes made, and placed one of them in a refrigerator in a grocery store in New York, and showed it to several persons when in operation.

Prior to this, and in August and September, 1852, Lyman had a closed refrigerating car fitted up. It had two ice receptacles, each with an open bottom. One operated with the aid of a fan. A pan under the grate on which the ice rested caught the water, and it was conducted out of the car. The air entered that ice-box through a charcoal filter. The other ice-box had no pan. Under the grate of that box was a descending conduit, and the water was caught by a flange. The height of the lower part of the conduit from the floor was 26 inches. On the floor, directly under the opening, was a rack for meat. The opening was 10 inches wide. This icebox depended entirely on gravity for its circulation. It held nearly a ton of ice, and was placed as near the top of the car as it could be, and yet allow a space 12 inches high, for the passage of air from the car over into the ice-box. The lower end of the descending conduit was 14 inches below the grate. In September, 1852, this car, so arranged, 918 was taken from New York City to Watertown, N. Y., and there laden with dressed meat. In the summer of 1853, Lyman had two other refrigerating cars fitted up, being the two referred to in the affidavit, made April 6th, 1864, before mentioned. In each of these cars there were two open-bottomed ice-boxes, and a conduit under the grate conducted the

cold air down to within about 18 or 24 inches from the floor. The air from the car was impelled into the top of both ice-boxes by a fan. The drip was carried out as before. These cars were taken from New York City to Cincinnati, Ohio, in July, 1853, laden with oysters in the shell, and a dressed sheep, which arrived at their destination in good order. They were laden, at Columbus, Ohio, in August, 1853, with dressed beef and dressed lambs, and taken to New York City, where the meat was sold.

In September, 1853, Lyman put up a closed refrigerator in Syracuse, N. Y., 16 feet long, 16 feet wide, and 16 feet high on one side, and 20 feet high on the other side. The icebox was placed near the top in the highest side of the refrigerator, and was 8 feet long, 5 feet wide, and 3 feet high. The ice was supported by a grate, which sloped towards the interior, and below the grate was an incline sloping from the lowest point of the grate in a reverse direction. The cold air chamber or space thus formed below the grate terminated below in a conduit 16 inches wide, and 8 feet long. The lowest part of the conduit was 4 or 5 feet above the floor. A shelf was placed about 3 feet below the opening, and in the descending current of air, and on this shelf articles to be preserved were placed. The drip was prevented by catching in a trough the water which flowed down the incline, and carrying it outside by a pipe. There was an opening above the sides of the ice-box, through which the air from the refrigerating room passed into the ice-box. This structure had the open-bottomed ice-box, the partition open above and below, the prevention of drip, the descent of cooled air, the rotation and circulation, the downward currents on one side, the upward currents on the other side, and the chamber for refrigeration directly under the open-bottomed ice-box.

In April and May, 1854, Lyman caused to be constructed for one Tilton a closed refrigerator, which

was put in use by him in Franklin market, New York, during the summer of 1854, and was used by Tilton there for several years afterwards. It embodied the same principles of construction and modes of operation, as the Syracuse refrigerator. It had a descending conduit 5 or 6 inches wide, and about 3½ feet long, and the lower end of which was about 16 inches above the floor. It was used to preserve poultry, which was placed on three shelves. One of the shelves extended under the conduit. This refrigerator stood in the open market for several years after the summer of 1854. Lyman personally showed it to a great many persons and explained its internal arrangement, and its principle and mode of operation.

In the summer of 1854, Lyman caused to be built 9 closed refrigerators, for domestic use, which were like the Syracuse refrigerator, in construction and mode of operation, except that they had no shelf below the cold air opening, but had a space or chamber there, for articles to be refrigerated. These refrigerators were built at Mount Vernon, Westchester county, N. Y. Lyman used one of them in his family for a dozen years or more, from and after July, 1854. Some of the others were sent to New York, and disposed of to various persons, and some were used in Mount Vernon.

Between 1852. and 1855, at least a dozen closed refrigerators of, like construction were made at the Novelty Iron Works, in the city of New York, according to plans furnished by Lyman. In some of them, the conduit extended down only 1½ inches below the cold air chamber under the ice-grate, and in others it extended down to within 12 or 16 inches of the floor of the refrigerator. These refrigerators were delivered to various parties for whom they were made. Of the above number, 8 or 10 were constructed, at such works during the year 1854, and one of those, made there by one Hadden, for his own use, is still in

existence, and has been put in evidence, and produced for the inspection of the court. This refrigerator was used by Hadden, in his family, for 4 or 5 years. It was and is, in construction, like the Syracuse refrigerator, before described, except, that it has no shelf below the cold air opening. In using it, however, Hadden placed on the floor, in and under the descending current of cold air, articles which he desired to keep the coldest. The cold air opening, at the bottom of the conduit, is 15½ inches long, and 2⅛ inches wide, and is 11½ inches above the floor of the refrigerator.

On the 21st of September, 1854, Lyman filed in the patent office an application for a patent for an "improved mode of cooling, drying and disinfecting air for ventilators and refrigerators." It consisted of a petition, specification, oath, and drawing (of 3 figures). A model was filed November 1st, 1854. The specification says: "My improvement in refrigerators consists in so arranging them that, as fast as the air becomes warm and moist and impure, by contact with the meat, it is drawn off and passed through the material, where it is cooled, dried and disinfected, and then returned to rise again among the articles in the refrigerator, collecting moisture and impurities, which it deposits in the receptacle intended for that purpose, thus keeping up a full circulation, and thoroughly ventilating the refrigerator with dry, pure, cold air. It is found, that meat, instead of becoming wet in a few days, in this refrigerator, becomes gradually dry."

919 The drawings represent a refrigerator constructed substantially like the Syracuse refrigerator, and the Hadden refrigerator, before mentioned. There is an ice receptacle high up, an open, grated bottom thereto, a cold air chamber below, a conduit below that, for the exit of the cold air, an arrangement for catching the water and conducting it to the outside, without interfering with the downward flow of the cold air, and an opening over the top of the dividing partition,

through which the air which has passed under the open bottom of the dividing partition, can find its way into the ice-box, the inner side and bottom of the ice-box, and the inner side of the conduit, forming the dividing partition. The specification states, that, the receptacle being filled with fragments of ice, the air among such ice will be cooled, and, becoming more dense, will settle down, through the grate on which the ice rests, into the cold air chamber below such grate, and thence down the conduit; that so long as the air in the ice is colder and heavier than that in the refrigerator, it will continue to fall down the conduit, mingling with the lower strata, and forcing the upper strata, or warmest air, through the opening above the dividing partition, into the ice receptacle; and that, when this air comes in contact with the cold surfaces of the Ice, its capacity for moisture is lessened, and the moisture is deposited on the ice. The specification proceeds: "By this arrangement of the ice receptacle in the upper part of the refrigerator, with an opening for receiving air in its upper part, and a grate at the lower part, on which the ice rests, a cold air chamber below the grate, and a descending conduit from this cold air chamber, or with an arrangement of parts substantially the same, so that the air shall be caused to circulate rapidly from bottom to top in the refrigerating chamber and from top to bottom in the separate combinations, as described, the air is not only cooled, but it is, by being frequently passed through the interstices of the ice, thoroughly dried, and it is washed, as by a hail storm, a decided improvement in its smell is effected, and the apparatus becomes not only a cooling and drying, but, to some extent, a disinfecting, apparatus, and meat placed in it is preserved fresh and pure a longer time than in any other refrigerator in common use, where both are kept at the same temperature, and consume the same quantity of ice." The claim, in the specification, is, to

“the combination of the reservoir of cooling, drying and disinfecting material, with the descending tube or conduit so that the cold condensed air in this conduit shall, on account of its increased weight, cause the warmer air to pass more rapidly through the material, where it is cooled, dried and disinfected, and, in its turn, to fall down the conduit, being, by its sides, kept separate from the other air until it mingles with the lower strata, substantially as described, for the purposes specified.” This application was rejected, on the 27th of November, 1854, for want of novelty, on the strength of three prior rejected applications, made by Thaddeus Fairbanks, James Lentell, Jr., and John Lewis, respectively. On the 20th of February, 1855, Lyman filed, as an amendment, a new specification, drawings, petition and model. No copy of such, new specification is furnished. On the 10th of March, 1855, the patent office, in re-examining the case, expressed a doubt whether the difference of temperature between the descending column from the ice chamber, and the air in the body of the refrigerator, would afford motive power or draft practically sufficient to maintain a current. Lyman, on the 28th of March, 1855, wrote to the office, that he had actually demonstrated, that the difference in temperature between the air in the ice-box and descending flue, and the air in the” body of the refrigerator, produced a circulation; that he had made several refrigerators on his plan; and that, in all, an abundant circulation existed, producing a remarkable effect in drying and purifying the air. In June, 1855, Lyman appears to have dropped the prosecution of such application, but, on the 1st of December, 1855, 18 days after the granting of the patent to Sanford, he filed a petition, specification, oath, drawing and model, in a new application, the fee paid on his caveat of August 20th, 1852, being allowed to him as a payment towards the fee on this application. The specification and drawing are

the same that are annexed to the patent afterwards granted to Lyman, March 25th, 1856, for an "improved method of cooling and ventilating rooms, &c," and the drawing is the same, substantially, as that annexed to Lyman's application of September 21st, 1854. On the 5th of December, 1855, the patent office rejected the new application of Lyman, assigning, as the only reason, that it was anticipated by the patent granted to Sanford November 13th, 1855. In reply, the office was reminded, that, in granting Sanford's patent, either Lyman's prior application must have been overlooked, or must have been deemed not to interfere with Sanford's; that Lyman was, according to the records of the patent office, the first person to construct a refrigerator in which the whole of the contained air was compelled to circulate through the ice-box, thereby securing perfect ventilation and drying; that a caveat for the invention was filed by Lyman August 20th, 1852; that the application for a patent was filed by him September 21st 1854; that the papers in the application now rejected were in strict accordance with the invention as first submitted; and that yet a patent had been issued to Sanford, without notice to Lyman, and for what was now declared to be the same invention. Thereupon, on the 25th of March, 1856, a patent was granted to Lyman, as above stated. The specification of that patent says:

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"My improvement in cooling, drying and disinfecting consists in the peculiar construction of the box or reservoir for holding the ice or other cooling material. The object sought to be accomplished by this construction is the production of a blast or current of cool air, in a determined direction, without mechanical aid, and irrespective of place. The principle I employ is that which is exemplified in the hydrostatic column, and my use of it may be understood by the following comparison: If we suspend a cake of ice freely in the

air, and near to the ceiling, of a closed room, slight currents would soon be produced by the disturbance of the equilibrium, consequent upon the cooling of the air in contact with the ice. These currents would be feeble, because the cold descending air would spread over a wide base, and the temperature soon become equalized by mixture with warm air. If, however, we should place under the ice a pipe of sufficient size to surround the ice, the air, as it cooled, would fall down and soon fill the pipe, but still have a tendency to spread laterally, in consequence of its gravity, and, therefore, it would exert pressure on all sides, similar to a non-elastic fluid. If a plug were now pulled out of the bottom of the pipe, this air would pour out with a certain force due to the difference of temperatures outside and inside, and to the height of the column, obeying precisely the same laws which would govern a non-elastic fluid. The construction of a refrigerating box on this principle enables us to employ it to various useful and valuable purposes, such as the preservation of meats and vegetables, ventilating, cooling, drying, and disinfecting apartments in hospitals, sleeping, and other rooms, all which will appear in the following description of the construction and operation of my refrigerating apparatus. This apparatus consists of three parts, viz., a reservoir, or receptacle, for the cooling material, a cold air-chamber, and a conduit or blast pipe. The reservoir, when adapted for holding ice as the cooling material, is a box open at the top, and as shown at D, figure 1. This is divided into two compartments, by a grating, the latter serving to support the ice, while the space beneath forms the cold air chamber E, which allows of the free settling of the cold air from all parts of the grate. At F is the conduit. This is a trunk or pipe attached to the cold air chamber, and may be of differing lengths, according as the blast is to be more or less forcible, the higher the column, the greater being the weight and velocity

of the discharge. I will now describe the manner of application, together with some of the various uses to which the instrument may be put. When enclosed within an air-tight compartment, (as shown in figure 1, at A,) and the box D charged with ice, the moisture will be extracted from the air at the same rate that its temperature is reduced, in the following manner: The air in A is, at first, of the temperature of the surrounding medium, and its hygrometrical condition is the same. Ice being now introduced into the box D, the air in contact will be immediately reduced in temperature, condensation takes place, and moisture is deposited. The condensed air, being of greater specific gravity, falls into the air-chamber E, flowing thence into F. Here, as it cannot spread out and commingle with the external and lighter air, it drives that already in the pipe before it, and out at the bottom, finally pouring out itself in a continuous stream. Once out, it still continues to act similar to the flow of water, spreading over the floor, and, in doing so, displaces the lighter and warmer air, forcing the latter upwards towards the top of the apartment. As it there comes in contact with the ice, the condensation and precipitation of moisture goes on until a minimum temperature is reached. Thus, a continual circulation is kept up, in such a manner that the whole of the air must circulate through the ice-box. Of course, all articles, such as meats and vegetables, would be deprived of their moisture in a like degree with the air, the latter being brought to the condition of great purity and dryness. As the water collects, it falls to the bottom of the cold air space E, when it is discharged to the outside by a suitable pipe." The claim of the patent is, to "the combination of a descending conduit or cold air flue with a reservoir for containing cooling materials, substantially in the manner and for the purposes described."

There is nothing in this patent of 1856 to Lyman that is not found fully developed in his application of September, 1854. In view of that application, the patent to Sanford, of November, 1855, ought not to have been granted. Lyman's application contained everything claimed by Sanford in his patent, namely, the arrangement, in a closed refrigerator, of an endless passage or chamber, running through an open-bottomed ice-box, and out at the bottom of it, and down, and under a partition, and up, and over such partition, and into such ice-box again, the construction being such, that the whole of the contained air circulates through such passage, and the water of the melting ice is discharged immediately from the refrigerator. If the patent of 1856 to Lyman was properly granted, with the claim it contains, a patent ought to have been granted to him on his application of 1854, with the claim then asked for. The evidence shows, that Lyman was the first inventor, as between him and Sanford, of what is claimed in Lyman's application of 1854, and of what is claimed in Sanford's patent of 1855, and of what is claimed in Lyman's patent of 1856.

So, too, everything that is claimed in the claims of Sanford's reissue of 1857, as those claims have been hereinbefore explained, is found in Lyman's application of 1854.

Lyman never abandoned his invention. 921 He devoted much time to perfecting It, commencing in 1852, and, after his refrigerators of 1854 had been constructed, and he regarded his invention as perfected, he applied for a patent.

It is urged, on the part of the plaintiff, that Lyman's structure did not contain a chamber of refrigeration, with shelves or fixtures for holding the articles to be refrigerated, placed in the descending current directly under an open-bottomed ice-box. As before explained, it does not require that the chamber should have

shelves in order to be Sanford's chamber. The Syracuse refrigerator of Lyman had such a chamber, with such a shelf, and so did the Tilton refrigerator of Lyman. Some of his other structures had such a chamber, with such a shelf. All of his structures had such a chamber, and so much of the chamber as was directly in the descending current could be, and was, used for the deposit of articles to be cooled. The question is merely one of degree. In the Syracuse refrigerator, such descending current was 16 inches wide, 8 feet long, and 4 or 5 feet high. In the Tilton refrigerator it was 5 or 6 inches wide, 3½ feet long, and 16 inches high. In the defendant's refrigerator it is only 5 feet 8 inches long, 2¼ inches wide, and 20 inches high. In the Hadden refrigerator, it is 15½ inches long, 21/8 inches wide, and 11½ inches high. In Sanford's original specification, there is no suggestion of the especial advantage of the use of a descending current. Such suggestion, in the reissued specification of Sanford, is an interpolation; and there is as much warrant for saying that Lyman's conduit may vary in width, so as to be as wide as the width of the ice-box, and thus become exactly like Sanford's conduit in the drawings of his original patent, occupying half of the width of the refrigerator and the entire width of the ice-box, as there is for saying, as is said in the reissued specification of Sanford, that the apartment under the ice-box may vary in width, and may be so narrow as to serve merely as a passage for the ascending current of air. In the structure shown in the drawings of Sanford's original patent, he exhibits a conduit as wide as the ice-box, extending down to the very bottom of the interior, and conducting the descending stream of cold air to the opening through which it passes into the other apartment. That conduit is so wide that shelves to hold articles to be refrigerated, or the articles themselves, may be placed in the conduit, and none of the apartment

under the ice-box is outside of the conduit. In Lyman's structures, he made his conduit shorter in length and narrower in Width, so narrow that no shelves could be placed in it, and no articles could be refrigerated in it, but a part of the apartment under his ice-box was outside of the conduit, and a portion so outside of the conduit was directly under the conduit, and in the descending current, and, in such current, shelves, and articles to be refrigerated, could be and were placed.

The conclusion at which I have arrived, after a careful consideration of all the evidence, and of the arguments of counsel, is, that the Sanford reissue is void for want of novelty.

As to the questions made respecting the want of notice in the answer as to some matters put in evidence, I think that, in any view, the case is a proper one to allow the amendments to the answer, which were moved for, at the hearing, on notice, nunc pro tunc, as of the time the answer was filed. The bill is dismissed, with costs.

{On appeal to the supreme court the decree of this court was affirmed. 91 U. S. 150

{For other cases involving this patent, see note to Roberts v. Buck, Case No. 11,897}.

¹ {Reported by Hon. Samuel Blatchford, District Judge, and by Samuel S. Fisher, Esq., and here compiled and reprinted by permission. The syllabus and opinion are from 11 Blatchf. 11, and the statement is from 6 Fish. Pat. Cas. 293.}

² {Affirmed in 91 U. S. 150.}

³ {From 6 Fish. Pat Cas. 293.}

³ {From 6 Fish. Pat Cas. 293.}

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