

UNITED STATES PATENT OFFICE.

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ROLLING DOOR FOR REFRIGERATORS OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 636,491, dated November 7, 1899.

Application filed October 29, 1898. Serial No. 694,937. (No model.)

To all whom it may concern:

Be it known that I, CHARLES COHEN, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Rolling Doors for Refrigerators or the Like; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to refrigerators or ice-boxes, and particularly to that class of refrigerators which contain compartments that have to be frequently opened and closed and for this purpose are provided with rolling doors arranged to pass up between the compartments and the ice-chamber to shut in the cold air and prevent the access of warm air to the ice. The rolling doors are of the form of a segment of a cylinder, and their edges are held in grooves or guides in the sides of the compartments and the doors slide or roll freely therein. They are arranged so that when opened a close connection is made between their upper ends and the lower edge of the front panel of the ice-chamber; but owing to the shrinkage of the panel this close connection is not permanent, and heretofore there has been no means by which the door could be adjusted to maintain an air-tight joint with the panel. Furthermore, in the event of the wood swelling the panel binds the door, so that it cannot be opened, and resort is had to trimming away the edge of the panel; but this causes a larger opening when the wood shrinks, and the efficiency of the refrigerator is permanently impaired.

The object of my invention is to remedy the defects in the construction of these refrigerators and to provide a door for the compartments which shall be adapted to maintain an air-tight connection with the front panel of the ice-chamber by automatically adjusting itself to the position at any time of the edge of the panel, and thereby close up any space that might result from shrinkage and also avoid binding in the event of the panel swelling.

In the accompanying drawings, Figure 1 represents a front elevation of a refrigerator provided with compartments closed by means of rolling doors. Fig. 2 is a cross-sectional view of one of the compartments and the roll-

ing door, the latter represented in its closed position and by broken lines in its open position. Fig. 3 represents the under side of the rolling door, showing the attachments by which the door is adjusted; and Figs. 4, 5, and 6 are enlarged sectional detail views of the device for adjusting the door.

Referring to the drawings, the refrigerator consists of an exterior case A, divided into the upper shelved part *a*, provided with hinged doors, the lower cupboards *b*, also provided with hinged doors, and the middle compartmented portion *d*, comprising one or more compartments C, each of which is the full depth of the refrigerator. These compartments are directly under the ice-chamber D, which is situated back of the shelved portion *a* in such a position that the cold air descends into the compartments C. As these compartments must be opened frequently, they are closed at the front by means of so-called "rolling" doors E, which are opened by sliding them up under the ice-chamber, thereby opening the compartment and shutting off communication between it and the compartments below, as indicated by the broken lines in Fig. 2. Each of the compartments has its own door, and they are divided from one another by partitions, so that the opening of one will not expose the others to the warm air. The rolling doors are in the form of a segment of a cylinder, and they move in grooves F, formed in the sides of the compartments. One of these grooves only is shown. The preferred method of making them is by applying a curved strip *e* to the side of the compartment to form the under side of the groove and forming the upper side by means of a bent piece of wood *f*, applied to the rounded projecting edge of the side of the compartment, as clearly seen in Fig. 2. This bent piece of wood *f* extends from the floor *h* of the compartment up to the panel *i*, that forms the front of the ice-chamber under the shelved part *a*. The outer surface of the top of the rolling door is intended to fit closely against the beveled edge *k* when closed; but owing to the alternate shrinking and swelling of the wood it will not do so for any length of time in the construction heretofore adopted. To obviate this defect, I make the grooves F much wider than is required by the thickness of the door, so that the door will have considerable play. Near the edges of the under

side of the door are spring-rollers G G G G, two on each side, near the top and bottom of the door. These rollers project toward the edges of the door, and their ends should be
 5 about flush with its edges. These rollers bear upon the under sides *e* of the grooves, and as they are connected with springs they have a tendency to force the door outward and upward, and thereby cause it to bear against
 10 the beveled edge of the panel *i*. Any form of spring-roller or its equivalent adapted to lift the door outward and cause it to bear with a yielding pressure against the beveled edge of the panel will answer the purpose of
 15 my invention; but the construction that I prefer is illustrated by Figs. 4, 5, and 6. In this construction the parts are made in the following manner: The socket-piece *l* is cylindrical in form and preferably, but not necessarily, screw-threaded exteriorly to adapt
 20 it to be screwed into a hole made in the under side of the frame of the rolling door. It is also formed with a chamber *m*, the diameter of which is large enough to receive the
 25 stem *n*, that carries the roller G, and the spiral spring *o* on the pintle *p*, that projects from the stem *n*. In the walls of the chamber, at opposite points, are inverted-L-shaped slots
 30 *q q*, the longer leg of which opens through the lower end of the socket-piece, as seen in Fig. 4. In the upper end of the socket-piece is a perforation *r* for the upper end of the pintle
 35 *p*. The upper end of the stem *n* forms a shoulder, and at this point there are pins *s s* projecting from the opposite sides of the stem. The roller G is loosely mounted on a pin *t*,
 40 projecting from the lower end of the stem. The parts of this contrivance are put together in the following manner: The spring, being placed on the pintle *p*, is inserted in the chamber
 45 *m* and the stem pressed up in the said chamber. The pins enter the longer leg of the slots *q q*, and the stem is pressed upward against the resistance of the spring until the
 50 pins are in line with the transverse parts of the slots, when it is turned axially until the pins reach the ends of these slots, when they drop into the shorter legs of the said slots, as
 55 seen in Fig. 6, and are held therein by the pressure of the spring. The stem is thus connected with the socket-piece by a modified bayonet-joint; but a longitudinal movement of the stem from the bottom of the shorter leg of the slot to the upper side of the transverse
 60 slot is permitted, and the length of the movement should be about three-eighths of an inch, more or less. By this construction of the rollers they are adapted to be readily inserted in the doors and also to be removed
 65 when necessary, and at the same time they have a free longitudinal movement.

It will be observed that the rolling door is supported in its position in the groove by the rollers, which rest upon the strips *e*, and, being pressed upward or outward, its upper end
 65 is held in close contact with the beveled under edge of the panel *i*, completely shutting

off the entrance of warm air. The door is set in the grooves so that the stems of the rollers are moved more or less back into the sockets, 70 thus retracting the springs and holding the door with some force against the outer sides of the grooves and the edge of the panel. Hence in case the panel shrinks the upper part of the door is caused to follow and 75 continue to press against it by the springs, and no opening can possibly form between. The swelling of the door and its consequent binding against the edge of the panel is one of the most serious difficulties encountered, 80 and frequently the door cannot be moved until the panel is trimmed off. My improvement does away entirely with this trouble. The use of the spring-rollers also makes the working of the door much easier, overcoming 85 its tendency to stick at any time by yielding sufficiently to overcome it.

A block J is fastened to each side in the rear of the panel *i*, and its lower edge is shaped to form a continuation of the upper or outer 90 side of the groove F. The object of this block is to hold the door down and in its proper place when thrown upward to the position indicated by the broken lines for the purpose of opening the compartment. A further pur- 95 pose of this block is to serve as the upper bearing for the door, under and against which it runs when slid back, and when closed its upper end passes from under the block and is forced up against the under edge of the 100 panel *i*, and thereby seals the joint between the panel and door. To prevent the door from being blocked by its upper end striking against the block, the upper corner of the door may be beveled or rounded off, so that it may pass 105 under the edge of the block easily and bear the door down and away from the panel. By this construction the upper end of the door when closed will always be forced up against and seal the panel. 110

I claim—

In refrigerators, the combination of an ice-chamber and the front panel thereof of an adjustable rolling door held in guides in the 115 sides of the compartment closed by the said door, blocks with curved under edges, fixed to the sides of the said compartment behind the front panel to bear the door down when opened and when closed to release the upper 120 end of the door and permit it to be thrown up against the bottom edge of the panel to close the space between the door and the edge of the panel, and spring-rollers, interposed between the under edges of the door and the bottom of the guides, to adapt the door to ad- 125 just itself to the edge of the panel when the latter shrinks, substantially as specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

CHARLES COHEN.

Witnesses:

FREDK. HAYNES,
 CHAS. E. PETERS.