

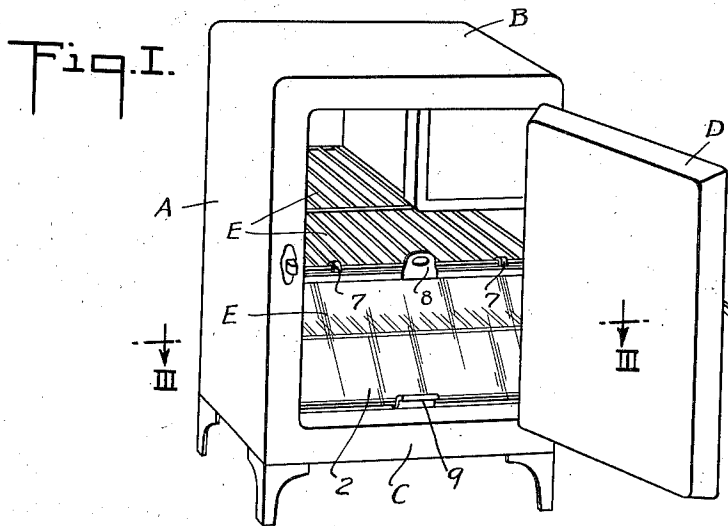
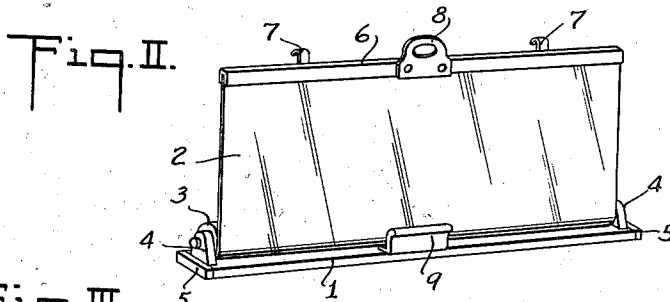
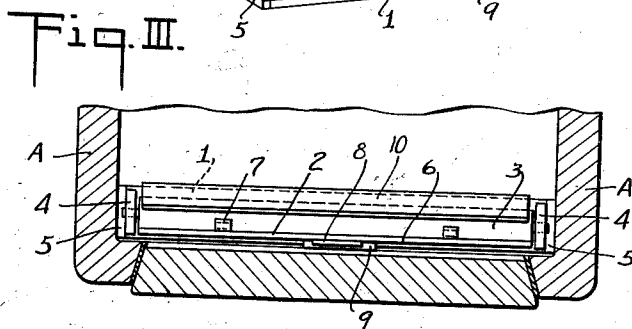
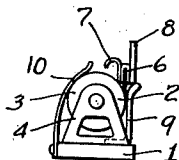
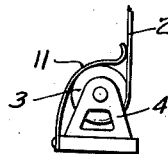
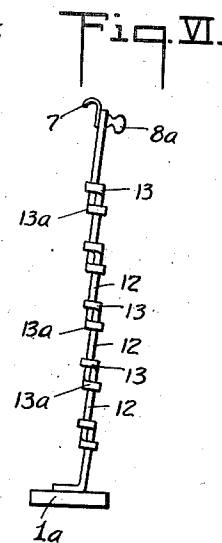
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REFRIGERATOR COLD SAVER

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REFRIGERATOR COLD SAVER

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5 Claims. (Cl. 312-190)

This invention relates to the conservation of the cold, that is the cold as represented by the cold air in a refrigerator, and more particularly the general type of household refrigerators as now in very general use. It applies to automatic refrigerators of the various now well known types as well as refrigerators in which ice is placed.

More particularly, among the objects of the invention are to prevent the out-flow of cold air when the main refrigerator door is opened for the purpose of inserting or extracting the usual articles which a refrigerator is intended to preserve by means of low temperatures, and for which purpose exists the refrigerator with a completely insulated compartment or compartments, with a substantially airtight door for ingress. In this respect the matter of my invention is with due regard to the fact that when the door is opened the cold air flows out at the bottom, and warm air flows in at the top, and thereby immediately negatives the effectiveness of the refrigerator by a loss represented by the necessity of additional power for the automatic refrigerators, but in addition causes more or less frequent changes in the temperature of the contents, and thereby may cause a spoilage of said contents with a substantial but indeterminate loss.

Heretofore attempts have been made in various ways, to minimize the effect of opening the door, but in all cases known to applicant they are either expensive, complicated and inconvenient, and in all cases cannot be effective or practical—in the manner and as compared with the results accomplished by applicant's invention. Nor can any such prior suggestion be universally applied to otherwise complete and finished refrigerators, nor readily installed.

Furthermore, applicant provides an article as a separate structure which may be inserted in all existing refrigerators. As an article of manufacture, it provides a simple device that by nothing more than slight muscular effort may be inserted and become immediately effective for the purpose intended. Likewise, it may be readily removed for cleanliness, replacement, adjustment or repair.

In general, the invention provides for a shiftable screen or curtain carried on a base at the bottom of the refrigerator opening, with means for practically locking it at the extreme bottom just inside the door opening, with means permitting the raising of the screen and holding it at predetermined desired heights—all together substantially sealing the lowest portion of the refrigerator chamber to prevent the out-flow of

cold air from the bottom—when the main airtight door is opened. Sealing the front of the refrigerator chamber in this manner at the bottom, and upward to a height at the desire of the user, effects the saving of the cold air which relatively concentrates in the lower portion of the chamber, and thereby likewise prevents the room air of a higher temperature affecting the volume of cold air at the bottom. It permits a momentary lowering of the screen or shield with one hand, while removing material from the refrigerator with the other hand, as a quick operation with a time-element that deters and substantially prevents any loss of the cold air from the refrigerator even from the top, that is the momentarily uncovered front near the upper portion, while at all times sealing the bottom which is the portion of the refrigerator from which the cold air under present conditions of refrigerators "spills out" immediately when the main door is opened, and syphons the hot air in at the top.

In particular, the utility of this invention is to at all times retain substantially all of the cold air in a refrigerator below the top of a horizontal curtain or screen, at whatever height or position such horizontal curtain may be maintained, being sealed at the bottom as to air movement, or as the screen may be temporarily lowered for purposes of removal from, or placing in the refrigerator products on shelves or on the level above the top of the screen when in predetermined position.

The refrigerating element in nearly every refrigerator is at the top, because the cooler air falls to the lower stratum. If placed at the bottom, the warm air syphoned at the top when the door is opened would require longer to be chilled, and hence the coldest air in any refrigerator chamber is at the bottom and is therefore the first to spill out when the door is opened in the heretofore existing types. The invention herein involved is to substantially seal from the bottom all possible outward flow and loss of the cold air whenever the main door is opened, and at the same time give practical access progressively from the top by means of quick and convenient lowering of the horizontal closure, whenever the vertical closure, namely, the main door has been opened.

My invention will be more fully understood from the particular embodiments shown in the accompanying drawing, in which:

Fig. 1 is a typical refrigerator or ice box, showing the door open and the equipment embodying

my invention in place at the bottom of the opening and in a position extended part way up.

Fig. II is the device removed from the refrigerator showing the complete structure adapted as an article to be inserted in standard ice boxes.

Fig. III is a plan view on section III—III of Fig. I, showing the device when installed in an ice box.

Fig. IV is an end view of Fig. II showing a form of mounting of the screen for functioning, as hereinafter described.

Fig. V is a similar end view with the parts slightly modified in construction.

Fig. VI is an end view of a modified form of a screen.

In an ice box such as the insulated casing with walls A, top and bottom B—C, a door D with its periphery beveled in the usual manner provides for the regular sealing. While varied in many respects in different refrigerators, a plurality of shelves involve cross-members E—E—E as the front of the shelves or sections to support the material to be refrigerated.

The cold-saver comprises the base 1 to support a screen 2, which in the preferred form is carried on a roller 3 supported by brackets 4. The roller may be of conventional spring-retracting type, and may be removable from its brackets in the usual manner. I prefer to use a transparent screen, and have found that suitable celluloid or like material provides for the necessary flexibility, and at the same time the toughness and durability desired for the purpose of this invention.

The base 1 has a slightly yielding means 5 at each end, which may be a rubber strip permanently secured to the end of the base 1, and of suitable dimension and yield to permit the base with its cushion end to be forced into a locking position with the sides of the chamber of the refrigerator, and to hold it in locked position against any strains incident to the functioning of the device. The mechanism therefore would be as shown in Fig. III, with the base 1 and its cushion ends 5 firmly locked in position against opposite interior walls of the box, and with the curtain or shield 2 at the outermost portion in close proximity to the inner surface of the door. As thus positioned, the curtain and its base present practically no interference with the insertion of material in the bottom of the refrigerator, and none whatsoever with the insertion on all of the shelves, that is when it is lowered to permit access to any of the shelves.

The top of the curtain is preferably provided with a stiff bar 6 or equivalent means, with two or more suitably spaced hooks 7—7 adapted to engage the outermost member at the front edge of any shelf or grid of the ice box. A central handle 8 provides for the manipulation of the curtain, that is to pull it up against resistance of the spring tension in the roller and hook it into place at the height desired, and conversely to remove it from the raised position and to allow it to retract downward to the extent desired. Should the cold-saving screen be lowered to the bottom, I may provide a shield 9 which prevents the handle 8 from dropping outward where it would otherwise interfere with the door.

In order to prevent cold air from passing between the shield roller and the base, I provide means for engaging the shield as it unrolls which, as shown, in one form is a strip 10 of light spring metal secured to the base 1 on its inner edge, and so formed as to, and of material that will, exert a light spring pressure against the screen portion

wound on the roller. In Fig. V, this cold-lock is shown extending over the top of the roller in order to prevent any accidental drippings of material from lodging between the upper bend and the rolled-up portion of the screen. Such arrangement of protective strip or cold-lock 11 may cooperate with the protecting strip 9, and thereby provide for the movement of the screen 2 in the outermost position close to the door inner surface, at all times, in addition to preventing any drippings from lodging in the device, and thereby avoiding any chance of unsanitary conditions.

While the screen may be of any material, I prefer a transparent curtain for convenience of observing the contents on all shelves, as well as assuring the opportunity at all times of thorough inspection.

In the modified form shown in Fig. VI, the base 1^a is to be secured at the bottom of the refrigerator just inside the door opening, but the form of curtain here shown is a series of panels 12—12—12, having successively end-engaging clips 13 on one side, and 13^a on the other side, or the other edge of alternate strips so constructed and arranged that when raising the top strip by handle 8^a, the successive strips or plates slide with snug surface engagement one over the other to the limit necessary for the application of the hooks 7, to the desired position to temporarily maintain the telescoping multi-sheet screen in its desired position to form an effectively airtight screen. When lowered, all of the sheets or plates may rest on the base 1^a to a height of the predetermined convenient maximum breadth of sheet. While applicable in certain cases, I do not find that for universal use its functioning would be as satisfactory, and it would usually limit the accessibility to the bottom space or to the floor of the refrigerator. Such a laminated screen however, may be made of glass sections or other suitable material, and as just stated would in certain forms of construction be applicable, and in any event provide a seal at the bottom and from the bottom of the refrigerator up, to accomplish the main purposes of my invention.

It will be noted that the device as shown and described, is a unit requiring no mechanical operation on any portion of any standard refrigerator, in connection with its insertion, and involves simplicity of construction for its regular functioning, as well as ultra-simplicity in the equipping of a refrigerator with the device. Likewise, ready removal is permitted, when desired, for complete cleansing if needed, or for repair or replacement, at all times, and without in any way injuring any portion of the refrigerator.

In the form herewith illustrated, the essential parts and their relations are shown, but it will be understood that dimensions may be varied, as well as material, to suit different cases. For example, as shown in Fig. III, the lateral edges of the screen overlap the lateral edges of the aperture and will therefore cling, with slight air pressure, to the inner surface of the reentrant wall at the front of the refrigerator, but this overlap may be greater by making the supports of the roller thin, and, furthermore, the cold lock strip 10 or 11 may extend close to the side walls of the refrigerator, and may even overhang the brackets of the roller, leaving only a small clearance to accommodate the compression of the end cushions 5, during insertion. Dimensions may be varied in other ways to insure the least possible space for the passage of air at or near the bottom and along the sides of the curtain, all

with the combination of the essential elements as hereinbefore described, and functioning to substantially hold the cold air which, on any normal pressure when the door is opened, would tend to press the edges of the screen into sealed contact with the adjacent inner surface of the refrigerator chamber.

While this invention provides for an article of manufacture that is readily attachable or detachable, for the purposes, and may be readily made in forms and sizes to suit standard constructions, and thereby readily apply to all existing refrigerators in use, it essentially provides in combination with a regular sealing and insulated vertical door, an inner horizontal door or closure sealed at the bottom, and adjustable as to height for accomplishing the very advantageous results as heretofore described.

While I have herein shown and described particular forms of my invention, in the manufacture and practical adaptation for use many variations may be made as to dimensions, material, design and otherwise, without departing from the spirit of my invention, but what I claim and desire to secure by Letters Patent is:

1. In combination in a refrigerator, an access opening, an insulated door, a vertically movable transparent screen at the inner side of the access opening, a roller therefor, means for supporting the screen and attaching it to the refrigerator, means attached to said supporting means for engaging the rolled screen at its inner side and preventing the outflow of cold air at the bottom of the screen, and means for attaching the screen at its top to the front edge of a shelf or like stationary fixture in the refrigerator.

2. In a refrigerator, an access opening, an outwardly swinging insulating closure therefor, an inner closure adjacent said access opening, a shelf or like stationary fitment inside and adjacent to said inner closure, said inner closure including a vertically movable screen associated with means of support and attachment to the

interior of the refrigerator, means attached to said first means for engagement with the screen and preventing outflow of cold air at the bottom of the screen, and means for attachment of the screen at its top to said stationary fitment in the refrigerator.

3. In a refrigerator, an access opening, a vertically movable screen positioned and serving to close the access opening at its inner side, means for support and attachment of said screen to the refrigerator, means to attach the top of said screen to a fixed fitment in said refrigerator at predetermined elevations, and means attached to said supporting means engaging said screen at its bottom and preventing outflow of air from the bottom of the refrigerator.

4. An article of manufacture for ready insertion adjacent the inner side of the access opening of a refrigerator, consisting of a vertically movable screen, means for supporting the screen and attaching it to said refrigerator, means attached to said first means at the inner side thereof for engaging the bottom of the screen and preventing outflow of air at the bottom of the screen when installed in a refrigerator, and means for attaching the top edge of the screen to a fixed fitment within a refrigerator adjacent to the vertically movable screen.

5. An article of manufacture for installation in a refrigerator to prevent cold air from flowing out from the bottom of the refrigerator, consisting of a vertically movable transparent screen, means to support the same and providing ready attachment and detachment of the screen from a refrigerator, means attached to said supporting means at the inner side for cooperation with the bottom of the screen in all positions of vertical movement of the screen for preventing outflow of cold air at the bottom of the screen, and means for attachment of said screen to hold the top of the same at predetermined elevations.

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