

Sept. 27, 1938.

W. A. ELLSWORTH ET AL
REFRIGERATOR DISPLAY CASE

2,131,587

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3 Sheets-Sheet 1

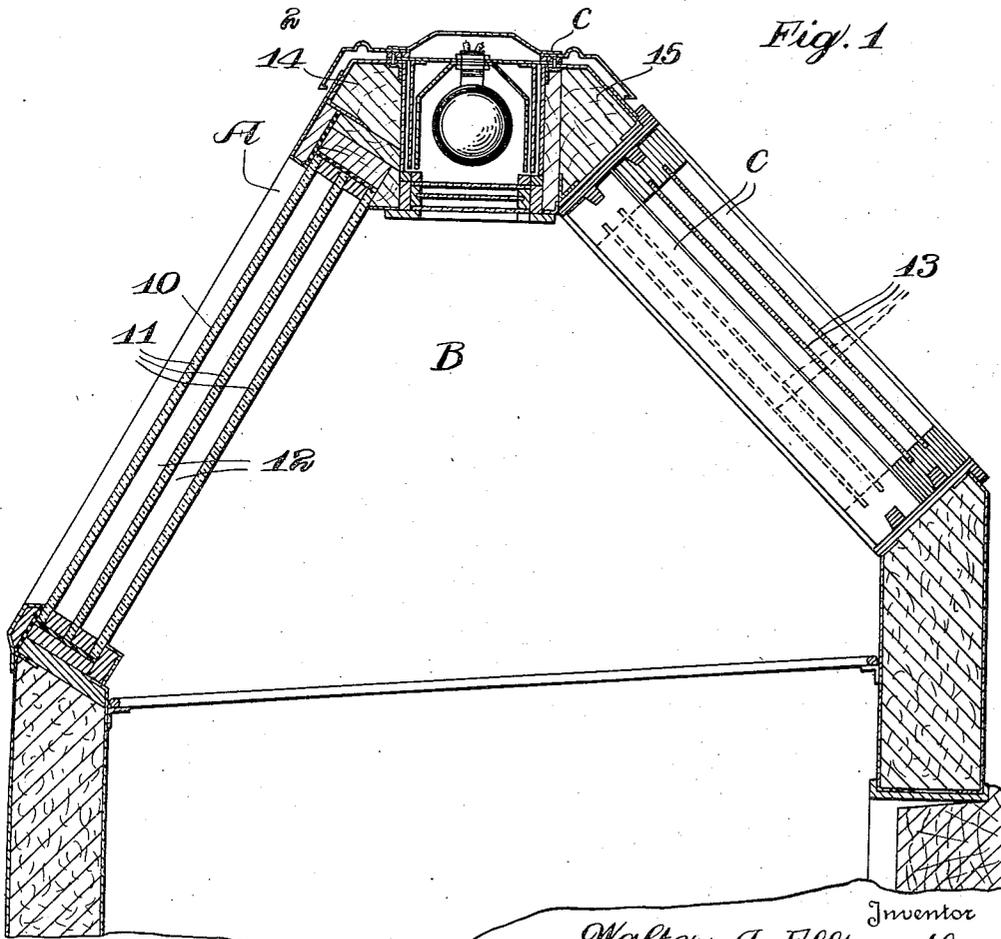
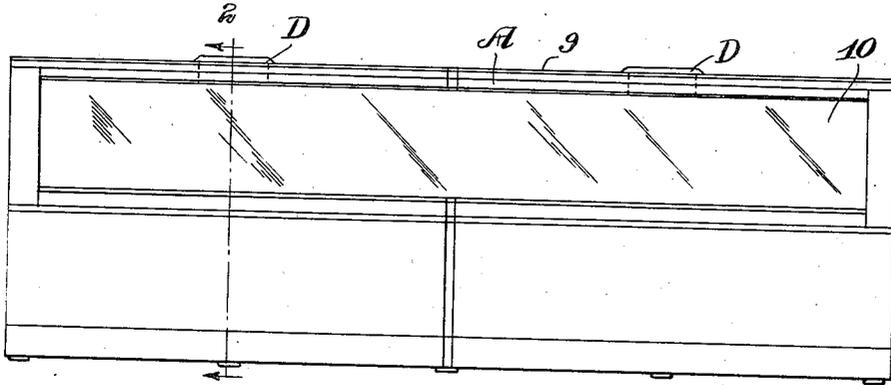


Fig. 1

Fig. 2

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3 Sheets-Sheet 2

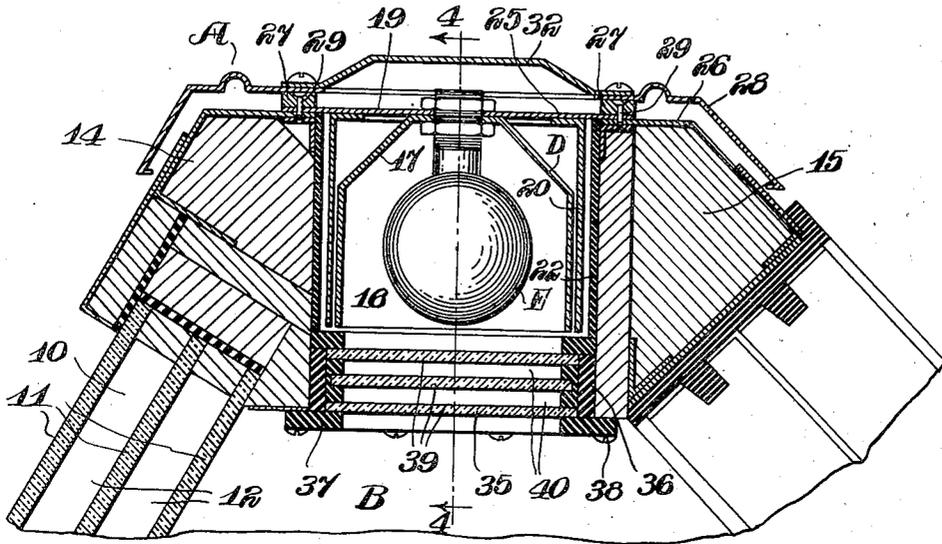


Fig. 3

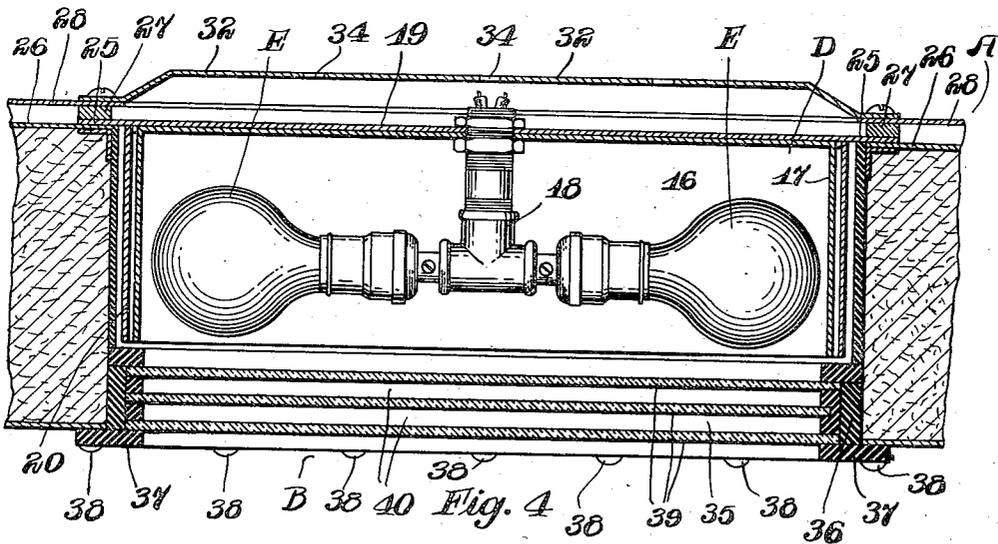


Fig. 4

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UNITED STATES PATENT OFFICE

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REFRIGERATOR DISPLAY CASE

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7 Claims. (Cl. 240—6)

This is a refrigerator show case wherein an illuminated means which is sealed from the inside and outside of the case is provided, to illuminate the contents of the case when it is desired.

A feature resides in providing an illuminating means built into the refrigerator case or cabinet and wherein the heat from the illuminating means is insulated from the refrigerator chamber of the cabinet to prevent the light from raising or influencing the temperature in the refrigerating case.

A further feature resides in providing a means of dissipating the heat from the illuminating means without ventilating openings, from the light well, to the outer atmosphere. The illuminating means is sealed in the light well and is kept clean and free of dust or foreign matter which might otherwise be inclined to collect in the light well and on the illuminating means. This is an important feature in that it overcomes the disadvantages found in prior refrigerator constructions where the illuminating means was built into the refrigerator cabinet and where ventilating openings have been provided to permit the heat to be carried out of the light well.

The invention further provides a means of access to the light well so that the electric lights used therein may be replaced when desired. This accessible means to the light well may be through the inside of the refrigerator chamber of the show case, or it may be from the outside, so that whenever it is desired, new electric lights may be put in place. When the light well is closed, however, the lights are sealed from the inner refrigerating chamber of the show case and the outer atmosphere.

It is also a feature to provide an insulation of a transparent nature on the inside of the light well so that the light from the electric lights in the same will shine into the refrigerator chamber. This insulating means is of a certain character so as to prevent any of the heat generated by the electric lights in the light well from entering the refrigerating chamber. The inner or upper end of the well is directly connected to the outer metal casing of the refrigerator cabinet, while the inner shell of the light well is made of a heat conducting metal, such as copper or other similar material, so as to dissipate the heat generated by the lights in the light well, to the outer casing of the refrigerator. Then the casing of the refrigerator acts as a radiator, disposing of the heat by radiating it away from the light well. In this manner a virtually hermetically sealed light well may be provided which is a material advan-

tage over the old forms which have been used to illuminate refrigerator show cases.

In the drawings forming part of this specification:

Figure 1 illustrates the front view of a form of refrigerator show case having the lighting means built into the same.

Figure 2 is an enlarged transverse cross section of a portion of the refrigerator show case, showing the light well built into the same.

Figure 3 is an enlarged detail section of one form of light well and attaching means for the same.

Figure 4 is an enlarged longitudinal section, on the lines 4—4 of Figure 3.

Figure 5 is a transverse enlarged sectional detail of another form of attaching the light well and giving access to the same.

Figure 6 is a longitudinal section on the lines 6—6 of Figure 5.

The drawings illustrate our refrigerator show case A which is designed to provide a means of displaying perishable goods such as meats, vegetables, fruits, and other similar foods, where it is desirable to keep the same under refrigeration and at the same time display the goods to the customers. The refrigerator A has a large show window 10 in the front of the same. This window is made of several spaced apart panes of glass 11 which have dead air spaces 12 between the same so as to thoroughly insulate the refrigerator chamber B within the cabinet A from the outer atmosphere. The window 10 may be of any suitable size in accordance with the design and construction of the refrigerator cabinet A.

Access to the refrigerator chamber B is made through the sliding doors C at the back of the refrigerator show case A. The doors C have windows 13 therein so that the contents of the refrigerator chamber B is also visible from the back of the refrigerator through the door windows 13.

The refrigerator A is provided with two top rails 14 and 15 which are spaced apart and provide the longitudinally extending insulating top rail portion for the refrigerator cabinet A. Between these rails the desired form of insulating material is provided to form the top shelf 9 of the refrigerator A.

At intervals between the rails 14 and 15 light wells are provided by leaving out the insulating material between the rails 14 and 15 for a distance as illustrated in Figures 4 and 6 to give the desired length to the light well D. Several of these light wells may be formed in the top frame of the

refrigerator cabinet A, and in the construction of the same illustrated in Figure 1 I have shown two of the light wells D. The light wells D are adapted to inclose the electric lights E within the light chamber 16.

Suitable light reflectors 17 are mounted upon the bracket 18 which is adapted to secure the light reflecting shield 17 directly to the light well hood 19. The hood 19 is made of suitable metal, such as copper or other metal being of a good heat conducting character, so that the heat from the lights E which is carried on through the bracket and dissipated to the reflector 17 may be picked up by the hood 19. The hood 19 is formed with depending flanges 20 on the sides of the same, which extend down on all sides of the reflector 17 and which are spaced therefrom to provide the air space 21 between the same. The depending flanges 20 of the heat collecting hood 19, which are made of copper or similar heat conducting material, are also spaced from the sides 22 of the light well D so as to form the air space 23 about the flanges 20 of the hood 19, thereby providing an air space about the same.

The heat collecting hood 19 is formed with a marginal top flange 25 which projects about the same and is adapted to form a comparatively wide metallic contact or heat conducting contact with the metal outer sheathing 26 of the refrigerator case, which extends over the outside of the top of the refrigerator A. In this form of the construction, the heat collecting hood 19 is secured in place by bearing strips 27 upon which the outer enamelled sheathing 28 rests. Suitable screws 29 hold the bearing strips 27 in intimate contact with the flange 25 to press the same tightly against the edge of the outer sheathing 26, thereby making a substantial contact which will readily carry the heat from the hood 19 to the sheathing 26.

The bracket 18 extends through the light shield 17 and the hood 19 and is secured in place by the lock nuts 30. The electric wires 31 for the lights E extend out through the bracket 18. The upper end of the hood 19 is adapted to be covered by an outer cover 32 held by the screws 33 to the enamelled casing 28. The cover 32 may be enamelled in the same manner as the casing 28 and may be formed with ventilating openings 34 therein, if it is desired, as illustrated in Figures 3 and 4. In the form illustrated in Figures 5 and 6, the cover 32 is not provided with the ventilating openings 34.

The light well D is closed on the inside by the window 35 which is made up of the hard rubber frame 36 having an attaching flange 37 which holds the frame 36 by the screws 38 in place to close the lower or inner end of the light well D. The window 35 is composed of a series of transparent window panes 39 which are held spaced apart in the frame 36 to provide the dead air spaces 40, thereby thoroughly insulating the light well from the refrigerating chamber B.

In Figures 3 and 4 of the refrigerator A, the lights E may be changed when it is desired, by removing the frame 36 by loosening the screws 38. Thus whenever it is desired to replace the lights E in this form of the refrigerator A, the frame 36 is removed from the inside of the chamber B. In this form of the light well D, a wide bearing flange 25 dissipates the heat from the light well D to the outer casing 26. The casing 26 is of metal or other heat conducting material and is adapted to carry the heat along the top of the refrigerator on the outside of the same.

This outer casing 26 which is preferably of metal, is adapted to be covered by the outer enamelled casing 28 which is held spaced away from the metal covering 26, and thus the heat from the lights E may be carried to the outer metal covering and dissipated into the outer atmosphere. The heavy window insulating means 35 on the inside of the light well D, prevents any of the heat from the lights E entering the refrigerating chamber B. The lights E are sealed in the light well D and are thus kept clean practically as long as the lights will last, thereby giving a good, clear, clean light into the refrigerator compartment B.

In the construction illustrated in Figures 5 and 6, the heat deflecting hood, together with the light reflector, is removably secured by means of the screws 42. The screws 42 hold the flange 25 of the heat deflector hood 19 in intimate contact with the metal sheathing 26, so that any heat gathered by the hood 19 is conducted out from the same into the metal sheathing 26 which extends longitudinally along over the beams 14 and 15. In this construction, the cover 32 is removable so that the heat deflecting hood 19 may be removed to permit new electric lights E to be placed in the supporting bracket 18. This gives easy access to the lights E when it is desired to change the same. In this construction, the window 35 remains fixed in position to close the inner end of the light well D.

The window 35, made up of the multiplicity of panes 39 provides a very efficient insulating means to prevent any heat from the light well entering the compartment B. This is more essential where the light well is sealed from the outer atmosphere, otherwise the heat might penetrate into the refrigerating compartment B.

The light supporting bracket 18 is made of a hollow tubular nature and is adapted to provide inlet and outlet means for the electric wires 31 and also provides a radiating means to carry off some of the heat from the lights E to the outer atmosphere. This hollow bracket 18, however, is sealed by the lock nuts 30 from the inner chamber of the light well so that no dust or dirt can be directed into the same through the bracket 18. The hollow and metal nature of the bracket 18 provides an additional means of radiating the heat out of the light well D.

The sealed lighting means for refrigerator show cases is also more desirable because it permits the greatest efficiency to be obtained from the lighting means. No dust or dirt can enter the light well and settle upon the glass which is between the light well and the refrigerator compartment, like in the old forms of show case refrigerators where a light well with a ventilating opening to the outer atmosphere was provided. Neither can any foreign matter, gnats or bugs enter the light well and interfere with the passage of light from the light well to the refrigerator compartment in our hermetically sealed light well.

Our heat radiating means carries the heat away from the lights and distributes it in a manner so as to prevent overheating of the same. This form of show case refrigerator also provides a means of lighting the inside of the same without any necessity of air deflectors adjacent the light well and display window but permits the light to be most efficiently directed over the entire contents of the show case in the refrigerating compartment.

We claim:

1. The combination of, an insulating frame adapted to provide a refrigerator show case, a

refrigerator compartment within said show case, a show window, a heat radiating covering on said insulating frame, a light well in said frame sealed from the atmosphere, a heat collecting means in said light well adapted to support electric lights therein, and means connecting said heat collecting means to said outer heat radiating covering to provide a radiating means for radiating the heat away from said light well.

2. The combination, a display refrigerator case, an insulating body adapted to form said case, a display window, an outer metal sheathing for said body, light well means formed in said body, electric lights positioned in said light well, an insulating window sealing said light well on the inside toward the refrigerating compartment of said show case, and means for collecting and radiating the heat from the electric lights in said light well means to the outer metal sheathing of said case, said heat collecting means closing said light well means to the outer atmosphere.

3. The combination, a refrigerator show case having an insulated body, an insulated display window adapted to insulate the refrigerator compartment on the inside of said case from the outer atmosphere and providing a transparent window to display the contents of said case, a light well formed in said body having an insulated window to direct light into the refrigerating compartment of said case and having a nature to insulate the light well from the refrigerator compartment, a heat conductor hood of copper or the like, a light reflector mounted in said hood, electric lights mounted in said reflector, a bracket for supporting said lights having a hollow nature and extending through said reflector and said heat radiating hood, said heat radiating hood closing said light well to the outer atmosphere, and means connected with said heat radiating hood to provide an outer additional heat radiating means adapted to carry away the heat from the electric lights in said reflector to the outer atmosphere while said light well is hermetically sealed.

4. A light well for a refrigerator including, a light reflecting member, means for mounting electric light means in said reflector, an air space about said reflector, a heat radiating hood spaced from and extending about said reflector, an insulating, transparent window at the open side of

said reflector and said heat radiating hood, flange means for supporting said heat radiating hood to hold the same spaced from the side walls of said light well to provide an air space thereabout, and means for clamping said flange means to the outer heat radiating surface of said case, whereby heat from the light well is radiated to the outer atmosphere with said light well hermetically sealed.

5. The combination, a refrigerator body having an insulating character, a light well hermetically sealed from the atmosphere formed in said body having electric lights therein, a light reflector, an air space about said reflector, a heat radiating and heat collecting hood spaced from and extending about said reflector, means for spacing said heat radiating hood from the inner walls of said light well, an insulating transparent window on one side of said light well to transmit light from the electric lights to the refrigerating compartment of said refrigerator case, and means for holding said window removable to give access to the electric lights in said well.

6. A light well for a refrigerator display case or the like, including, a hermetically sealed light well, electric light means in said light well, light reflector means, means insulating said light well by a transparent window to direct light to the refrigerating compartment, means connecting said light well to the refrigerator outer surface for radiating heat from said light well to the outer atmosphere along the surface of the display case, and guard means over the outer portion of said light well to conduct heat away from the light well.

7. A light well for a refrigerator including, an insulating window having dead air spaces therein and adapted to permit light to be projected into the refrigerator compartment of the refrigerator, a light reflector hood, and a heat collecting and radiating hood connected together and spaced apart to provide air spaces therebetween and adapted to close one side of the light well, and means contacting with said heat collector and radiating hood to provide a conducting contact outside of the refrigerator to radiate heat away from said hood which is shut up in said light well.

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