March 22, 1938. R. E. KAUFMANN 2,112,027

REFRIGERATOR TRAY

Filed Oct. 3, 1936

Fig. 1

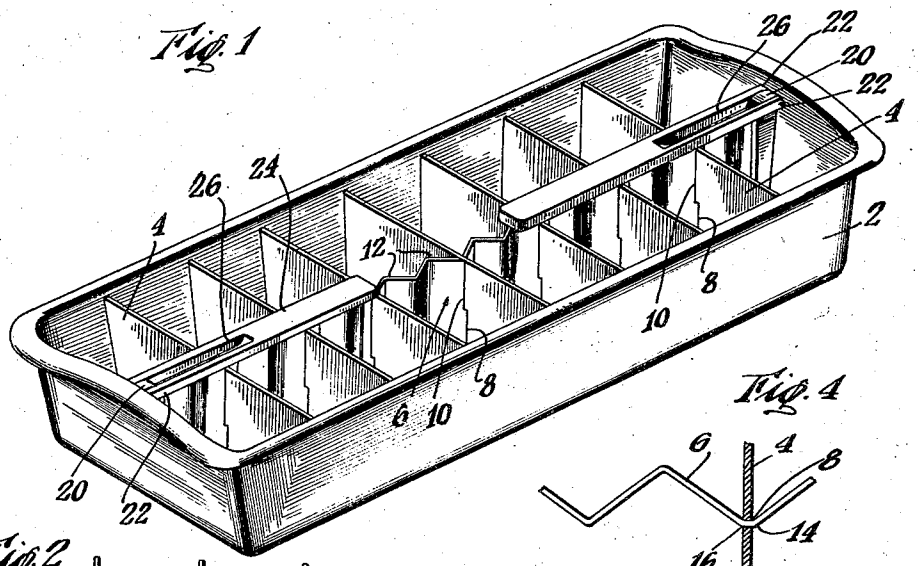


Fig. 4

Fig. 2

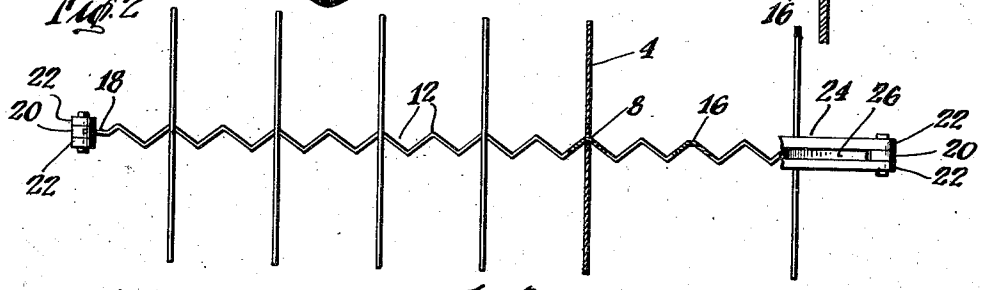


Fig. 3

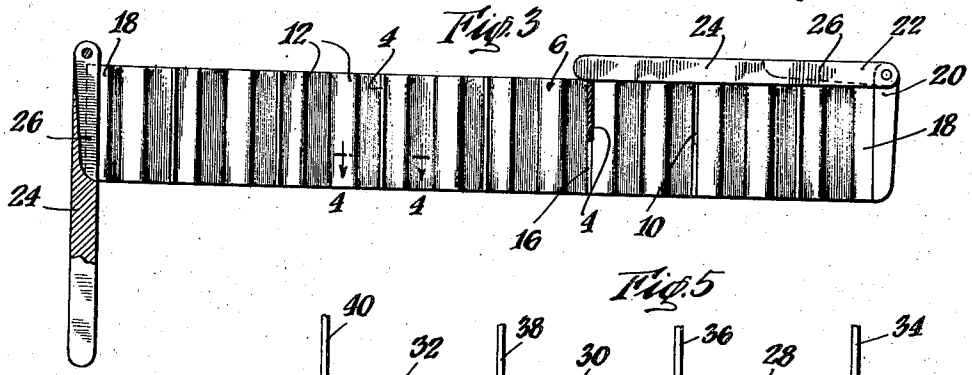


Fig. 5

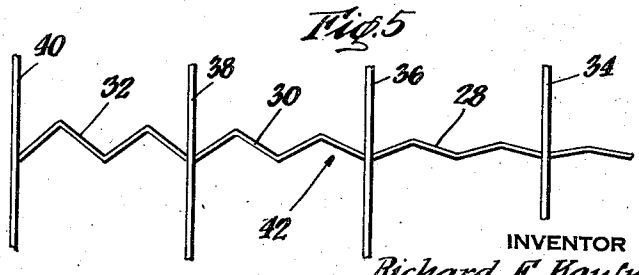
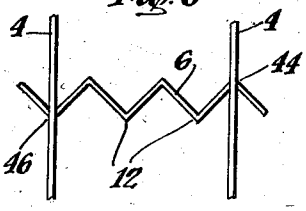


Fig. 6



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REFRIGERATOR TRAY

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Application October 3, 1936, Serial No. 103,848

14 Claims. (Cl. 62—108.5)

This invention relates to removable grids of the type used in ice cube trays of mechanical automatic refrigerators.

When ice cubes are frozen in the known types of ice cube trays, they adhere strongly to both the ice cube tray and to the grid which subdivides the tray into a plurality of small compartments. Attempts have been made in the past to provide grids which are readily releasable from the ice cube tray and are in turn readily releasable from the individual small blocks or cubes of ice. Trays and grids are constructed of both metallic and of non-metallic materials, some of the grids being flexible in order that they can be bent or twisted to separate the ice cubes from the elements of the grid.

The metallic grids are of a complicated nature requiring such operations as bending and spot welding to produce a unit which is sufficiently flexible for the desired purpose.

The non-metallic, for example rubber, grids and trays are inherently flexible and no particularly complicated or expensive operations are required for their production other than molding and vulcanizing. Such non-metallic constructions suffer the disadvantage however of being relatively non-heat conductive, thereby greatly increasing the length of time required for freezing the cubes.

The present invention has as an object the provision of a highly flexible ice cube tray grid which is readily removable from a tray.

A further object of the invention is to produce an ice cube tray in which the longitudinal partition is flexible, resilient and can be twisted, bent and even longitudinally extended to release the cubes or blocks from the grid.

A still further object of the invention is to produce such a longitudinal partition inexpensively with a minimum of manufacturing treatments and with a minimum of structural elements.

In achieving the objects of the invention I have discovered that a corrugated resilient partition member is capable of fulfilling all the requirements of the objects hereinbefore set forth.

More specifically my grid may consist of a longitudinal partition of a length substantially that of the internal dimensions of the ice cube tray. This longitudinal partition is provided with corrugations of any desired shape extending transversely thereof. Suitable means are provided along the length of the longitudinal partition for receiving transverse grid members. The transverse partitions are preferably flat sheets of metal of suitable proportions to extend transversely in the ice cube tray and being in number sufficient to divide the tray longitudinally on opposite sides of the center partition member into a plurality of small freezing compartments.

The corrugations in the longitudinal partition may be of various sizes, but preferably they should be relatively small so that the ice blocks do not have a peculiar or undesirable shape. The corrugations may also vary in size in the same partition. The corrugations in the central partition permit the grid to be bent arcuately longitudinally, twisted axially and also stretched axially. The outermost portion of the corrugated partition will be extended and flattened proportionately when the grid is bent thereby tending to force or eject the cubes from the grid. In addition, the extension of the center partition will tend to break the transverse partitions away from the sides of the ice blocks because of relative movement between the blocks and the partitions. The grid may also be twisted thereby aiding in breaking the transverse partitions loose from the ice blocks.

The grid may also be provided with suitable means for removing both the grid and the ice blocks from the tray and for twisting and bending the grid after removal from the tray.

For a better understanding of the invention reference may be had to the accompanying drawing in which:

Figure 1 is a perspective view of a grid embodying my invention in a conventional ice cube tray.

Figure 2 is a plan view of a grid embodying my invention partly broken away and partly in section to show details of the construction thereof.

Figure 3 is a side view of the grid, partly in section, and with one of the manipulating handles swung downwardly into ice-block-ejecting position.

Figure 4 is an enlarged sectional view of a detail of the transverse and longitudinal grids taken on line 4—4 of Figure 3.

Figure 5 is a plan view, partly broken away, of a modified form of grid with a plurality of the transverse partitions mounted thereon, and,

Figure 6 is an enlarged view of a portion of a modified form of grid.

An ice cube tray 2 of conventional form is shown in Figure 1 which in the known manner is insertable in a refrigerating space of an automatic refrigerator for freezing blocks of ice therein. Supported loosely in the tray 2 is a grid member consisting of a plurality of trans-

verse partitions 4 dividing the tray 2 into a plurality of longitudinally spaced compartments. The transverse partitions 4 are mounted in any suitable manner on a longitudinal partition 6, preferably by means of a slot 8 straddling said partition 6 which is also provided with slots 10 extending approximately half way therethrough. The partition 6, as shown in Figures 1 and 2, may consist of a longitudinally extending member, preferably of highly conductive metal, which is in itself resilient and is rendered even more resilient and extensible by a plurality of transversely extending corrugations 12. As best seen in Figures 2 and 4, the slots 10 in the longitudinal partition are located at the corresponding crests 14 of spaced apart corrugations. The corrugations in which the slots 10 are located preferably have flat crests 16 as shown in Figure 4. The flat crests 16 engage the portions of transverse partitions 4 adjacent slots 6 and prevent oscillation of the transverse partitions 4 relative to the longitudinal partition 8. As best shown in Figures 1 and 3, the ends of the longitudinal partition 8 are provided with axially extending projections 18 extending beyond the corrugated portion of the partition and having upwardly extending lugs 20 received between bifurcated legs 22 of ejecting handles 24 so that the handles may be swung around to lie on top of the grid or alternately swung over to engage the ends of the ice cube tray 2 to act as levers to eject the grid from the tray. The handles 24 are provided with slots 26 which receive the extensions 18 in the position shown at the left hand end of Figure 3 to flex, twist and/or bend the ice cube tray.

In use when blocks of ice have been frozen between the partitions 4 and 8 of the grid, the handles 24 may be swung outwardly and downwardly to engage the ends of the trays 2 to break the grid and the ice cubes loose from the tray, and to lift the grid from the tray. The handles 24 may then be swung into position to receive extensions 18 of the grid in slots 26 of handles 24, as shown in Figure 3 and forced toward each other and twisted relatively to expand the outer portion of the tray lengthwise, break the cubes loose and force them laterally out between the partitions 4 due to the flattening and extension of the corrugations.

The corrugations in the longitudinal partitions may be varied in amplitude from one end to the other, or from the center of the partition outwardly from each end. When cubes are removed from end compartments of the grid, only, the empty portion of the grid is far more flexible than the portion of the grid yet containing ice cubes. Therefore, those portions from which the cubes have been removed will flex greatly without producing a corresponding flexing and/or extension of the longitudinal grid in the portion where the ice cubes remain. In order to overcome unequal flexing and, conversely, to equalize the flexing of the ice cube tray under these circumstances, the corrugations 28 may be made of less amplitude than the corrugations 30; and the corrugations 30 of less amplitude than the corrugations 32, between the transverse partitions 34 and 36, 36 and 38, and 38 and 40, respectively. Thus corrugations 28 are less extensible and the longitudinal partition 42 is less flexible between partitions 34 and 36, than the corrugated portion 30 of grid 42 and will tend to equalize the flection of the partition 42.

A modified type of corrugation in the longitudinal partition 8 is shown in Figure 6. The slotted corrugations 44 and 46, which receive the transverse partitions 4 are opposite crests of the corrugations, rather than corresponding crests as shown in Figure 2.

While the corrugations disclosed in the forms of the device above described are shown as generally V-shaped in cross section, it will be understood that they may be in the form of a sine curve or a similar sinuous curve. They may be of a generally straight sided U formation having a flat base or they may have inclined straight sides with rounded crests without deviating from my invention.

From the foregoing, it will be understood that my invention, embodying a highly flexible extensible center partition of generally corrugated form, is susceptible of many variations which will readily occur to those skilled in the art. Therefore, the typical embodiment of the invention as disclosed should be considered as illustrative of this invention and not as limiting the scope of the appended claims.

I claim:

1. In a removable grid for ice cube trays, the combination of a longitudinal partition and a plurality of transverse partitions supported by said longitudinal partition, said longitudinal partition being corrugated to render it flexible and extensible.

2. In a removable grid for ice cube trays, the combination of a longitudinal partition and a plurality of partitions extending transversely of and supported by said longitudinal partition, said longitudinal partition comprising a resilient strip of material provided with corrugations to render it flexible and extensible.

3. In a removable grid for ice cube trays, the combination of a resilient strip of metal forming a longitudinal division wall, transversely extending corrugations in said strip permitting longitudinal extension and twisting of said strip, and at least one division wall supported by and extending transversely of said strip.

4. In a removable grid for ice cube trays having a plurality of transverse partitions dividing the tray into a plurality of compartments; the combination with the transverse partitions of a transversely corrugated longitudinal partition of resilient material whereby ice cubes may be removed from between the partitions by bending, twisting and longitudinally stretching the longitudinal partition.

5. The combination set forth in the preceding claim in which the corrugations differ in size.

6. The combination set forth in claim 4 in which the corrugations decrease in size from one end of the partition to the other.

7. The combination set forth in claim 4 in which the corrugations decrease in size from the center of the partition to the ends of the partition.

8. The combination set forth in claim 4 in which a lever is pivotally connected to one end of the longitudinal partition for lifting the grid from the tray.

9. The combination set forth in claim 4 in which the corrugations are V-shaped in cross-section.

10. In a removable grid for ice cube trays having at least one transverse partition dividing the tray into a plurality of compartments; the combination with the transverse partition of a longitudinal partition, a slot in said longitudinal partition for receiving the transverse partition, said longitudinal partition being resilient and

corrugated throughout substantially its length said slot being located at the crest of a corrugation.

11. The combination set forth in claim 10 in which the corrugations are substantially V-shaped in cross-section.

12. The combination set forth in claim 10 in which the corrugations are substantially V-shaped in cross-section, that corrugation containing the slot having a flattened portion in alignment with said slot.

13. The combination set forth in claim 10 in which the corrugations in one portion of said partition differ in size from the corrugations in another portion of said partition.

14. In a removable grid for ice cube trays; the combination of a longitudinal partition, transverse corrugations in said partition, transverse partitions supported on said longitudinal partition, and a slotted and grooved lever pivotally mounted at one end of said longitudinal partition, whereby the lever may be swung against the ice cube tray to remove the grid, and may be further swung substantially perpendicularly to the longitudinal partition to provide a handle for bending and twisting said grid.

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