Aug. 17, 1943. R. W. EIDSON 2,326,771

CONTAINER

Filed July 5, 1941

Fig 1

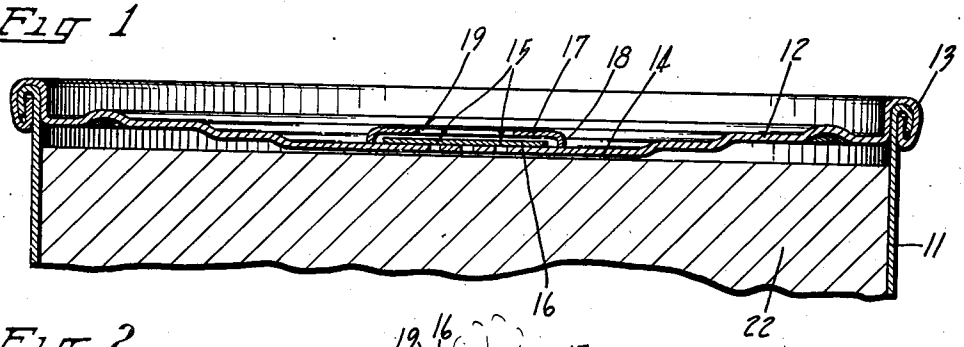



Fig 2

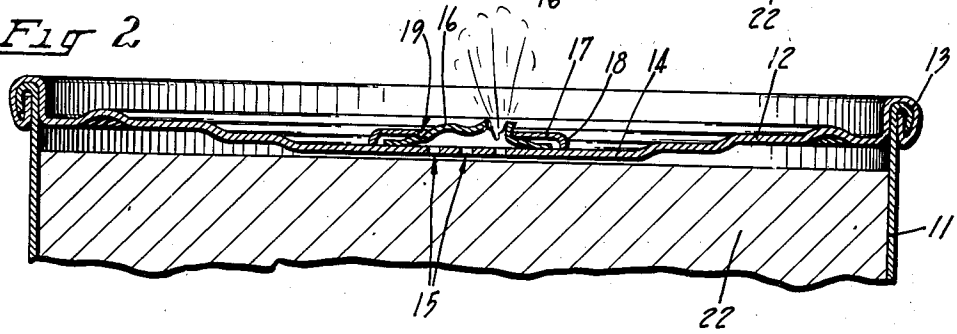
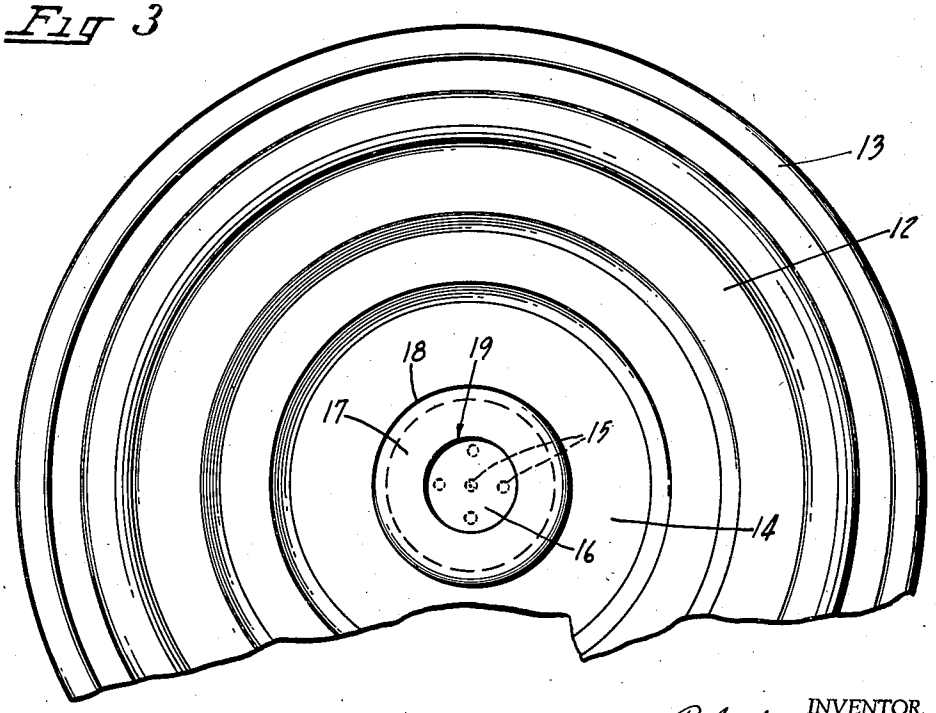



Fig 3




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2,326,771

## CONTAINER

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1 Claim. (Cl. 220—1)

This invention relates to sheet metal cans or containers for food and the like and has particular reference to a frangible hermetic seal in the wall of the can which may be broken easily by the development of relatively low internal can pressure so as to indicate abnormal conditions within the can such as would be caused by spoilage of the contents.

Certain perishable food products are packed in cans or containers without the use of preservatives and are retained in edible condition by freezing. Such frozen food products when kept at refrigerated temperatures may be preserved for an indefinite time. Exposing the sealed frozen food cans to room temperatures for appreciable periods, however, will cause fermentation of the contents of the can which is not discernible in its early stages and such cans may be refrozen and then passed off as good cans. If this internal spoilage process is permitted to continue for a sufficient time interval the can will swell and sometimes burst open, but since even a slightly fermented food is unfit for human consumption, there is the ever present danger that some cans not having sufficient internal pressure to give visual evidence of spoilage, nevertheless may contain a fermented product.

The present invention contemplates overcoming the possible danger of spoiled food being sold to the public by providing a sheet metal can with a weakened area or seal which will break at relatively low internal can pressures and thereby visibly indicate the edibly unfit condition of the product within the can.

An object of the invention, therefore, is the provision of a sheet metal can having a frangible hermetic seal secured over a perforated end wall of a can, which seal will protect the canned contents against the usual external pressure to which such cans are subjected, but the seal is adapted to break at relatively low internal can pressures thus visibly indicating the spoiled condition of the food product.

Another object of the invention is the provision in such a can of a vent valve having an inexpensive thin metallic disc secured over a plurality of small vent holes in the top end wall of the can, which disc is partially covered by an overlapped protective cap to shield the frangible disc externally. Such a cap, however, does not extend above the cover rim to interfere with stacking of the cans, the discs and protective caps being scarcely noticeable when the food product is in perfect condition, but showing evidence of relatively low internal pressures or showing rupture of the disc thereby visibly indicating that the food product is in a spoiled condition.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawing, discloses a preferred embodiment thereof.

Referring to the drawing:

Figure 1 is a fragmentary view in vertical section of the upper portion of a filled can embodying the present invention;

Fig. 2 is a similar view showing the frangible sealing disc partially expanded and in a state of being broken due to internal pressure; and

Fig. 3 is a fragmentary top plan view of the can shown in Fig. 1, showing the frangible disc and protective cap disposed in the sunken panel of the top end member.

As a preferred embodiment of the invention the drawing illustrates a sheet metal can which is adapted in one of its applications to the packing of frozen food products. This can includes a cylindrical can body 11 having top and bottom closure members secured thereto. For the purpose of this invention only the top closure member need be shown and such a member is designated by the numeral 12. A double seam 13 secures this top end closure to the can body 11.

The top closure 12 of the can preferably is formed with a circular sunken panel 14 which is provided with a plurality of small openings or perforations 15. These openings are formed in a circle concentric with a single central opening.

An imperforate thin metallic disc or tin foil element 16, preferably circular in outline, is secured to the sunken panel 14 of the top end 12. Such a disc may be soldered in place or otherwise secured.

Where the disc 16 is formed of tin foil the tin content will provide for its own soldering element. In securing it in place the marginal edge of the disc preferably is fluxed and is then heated sufficiently to fuse the disc edge and can top together. A heating ring may be used which covers only the marginal edge of the disc and such a ring may have a water cooled center plug to conduct the heat rapidly from the center of the disc. Otherwise the entire disc might melt owing to its relative thinness.

Such a thin frangible disc is normally flat and when attached to the can end panel hermetically seals the vent openings 15. This frangible seal is capable of withstanding greater external pressures than internal pressures. This is due to the perforated panel supporting the disc against ex-

ternal pressures, whereas internal pressures created within the container pass through the vent openings and act upon the entire inner exposed surface of the disc to expand it outwardly and if to a sufficient degree will cause it to fracture. Any desired predetermined breaking point may be selected, depending upon the thickness and material used for making the frangible seal.

A protective cap 17 having a curved depending external flange 18 bordering upon the outer periphery of the cap is positioned on the circular sunken panel 14 so as to overlap the outer edge of the sealing disc 16 and is secured to the sunken panel 14 as by solder. The protective cap 17 has a centrally disposed opening 19 through which the sealing disc is visible and also through which the disc may expand and rupture at any desired or predetermined pressure as determined by the frangibility of the disc. This protective cap serves as a shield for the thin frangible sealing disc which otherwise might be fractured inadvertently by rough handling.

For the purpose of this invention it is desirable to use a thin metallic disc adaptable for easy breaking at a relatively low internal pressure to indicate a condition of spoilage of the food product in the can.

Such a sealing disc 16 and its protective cap 17 secured to the sunken panel 14, as illustrated and described, are wholly within the can end rim dimension and do not interfere with handling or stacking. They are hardly noticeable when the food product in the container is in unspoiled condition. The top end closure 12 has the sealing disc and the protective cap secured in position on the sunken panel prior to assembling and sealing of the completed cover to the filled can.

When the sealed container filled with a frozen food product 22 has been exposed to room temperature for even a short period of time, fermentation and spoilage of the product commences. It is desirable to identify such containers to prevent the fermented food product being consumed and in the present embodiment the gases are permitted to escape upon breaking of the hermetic seal 16. The broken seal will serve as a tell-tale for the ultimate consumer about to purchase the canned food.

Internal gases generated by the fermentation and spoilage of the can contents pass through the vent openings 15 of the top end closure and exert pressure against the sealing disc 16. This expands the disc, first bending it to an outwardly flexed position. Further accumulation of pressure finally fractures it, as shown in Fig. 2. In this expanded and broken condition the seal visibly indicates that a pressure has been built up within the container and has escaped and this is indicative of food spoilage.

Should an expanded disc be fraudulently punctured to permit escape of the gases from a spoiled can, the disc nevertheless remains in its distorted condition and cannot be repaired without detection. Even if it were possible to mend the tear such a distorted seal upon being pressed down against the can top, will show wrinkles to indicate the fraudulent action and will show that the can at one time had been subjected to an internal pressure condition.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

A container for frozen food products comprising a container body, a countersunk end closure member secured to said body, said end closure having a vent hole disposed therein, a substantially flat frangible expansible sealing disk disposed over the exterior of said vent hole and having its marginal portion only secured to said end closure, and a shallow cup shaped protective cap having a centrally disposed aperture therein enclosing and spaced from said expansible sealing disk and also secured at its marginal edges to said end closure member, said sealing disk being capable of expansion outwardly due to developed abnormal relatively low internal gas pressure effective through said vent hole as a result of decay of the contained food product, the expanded sealing disk projecting at its central portion through the central aperture of said protective cap to visibly indicate the spoiled condition of said food product.

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