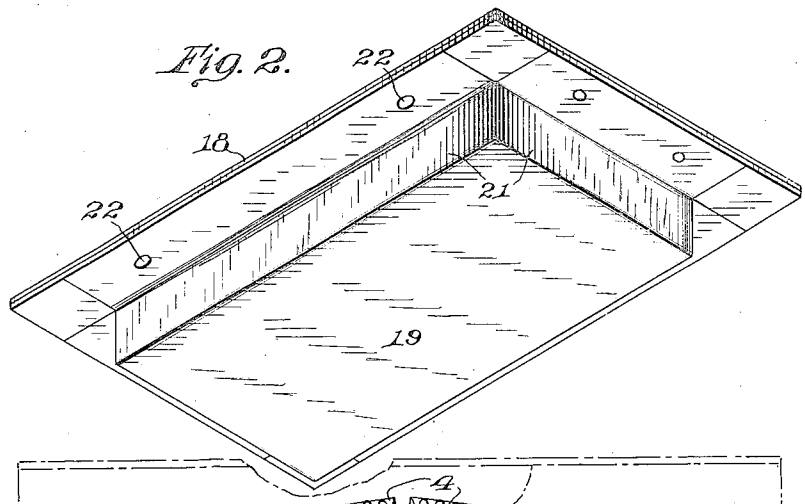
Feb. 24, 1925 1,527,167

C. BIRDSEYE

HEAT INSULATED SHIPPING CONTAINER

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Fig. 2.



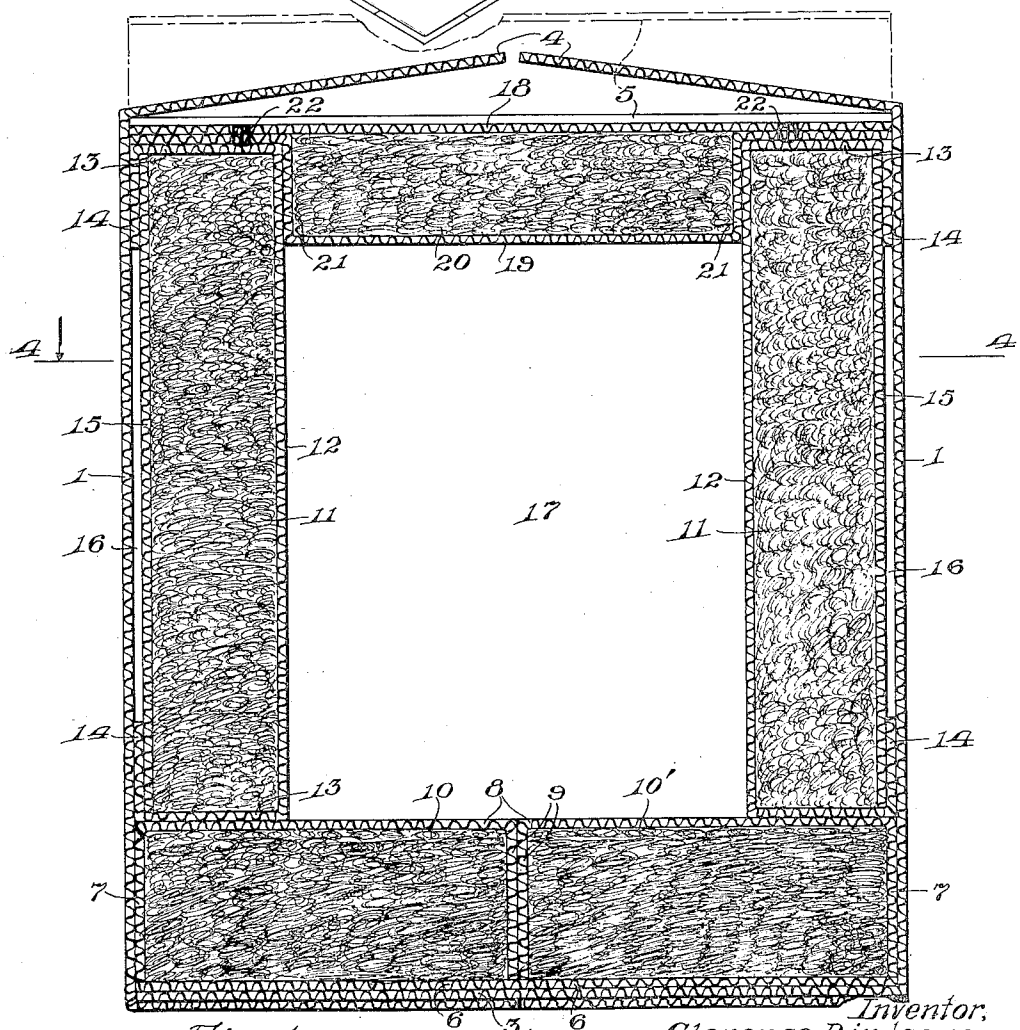


Fig. 1.

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HEAT INSULATED SHIPPING CONTAINER

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Fig. 3.

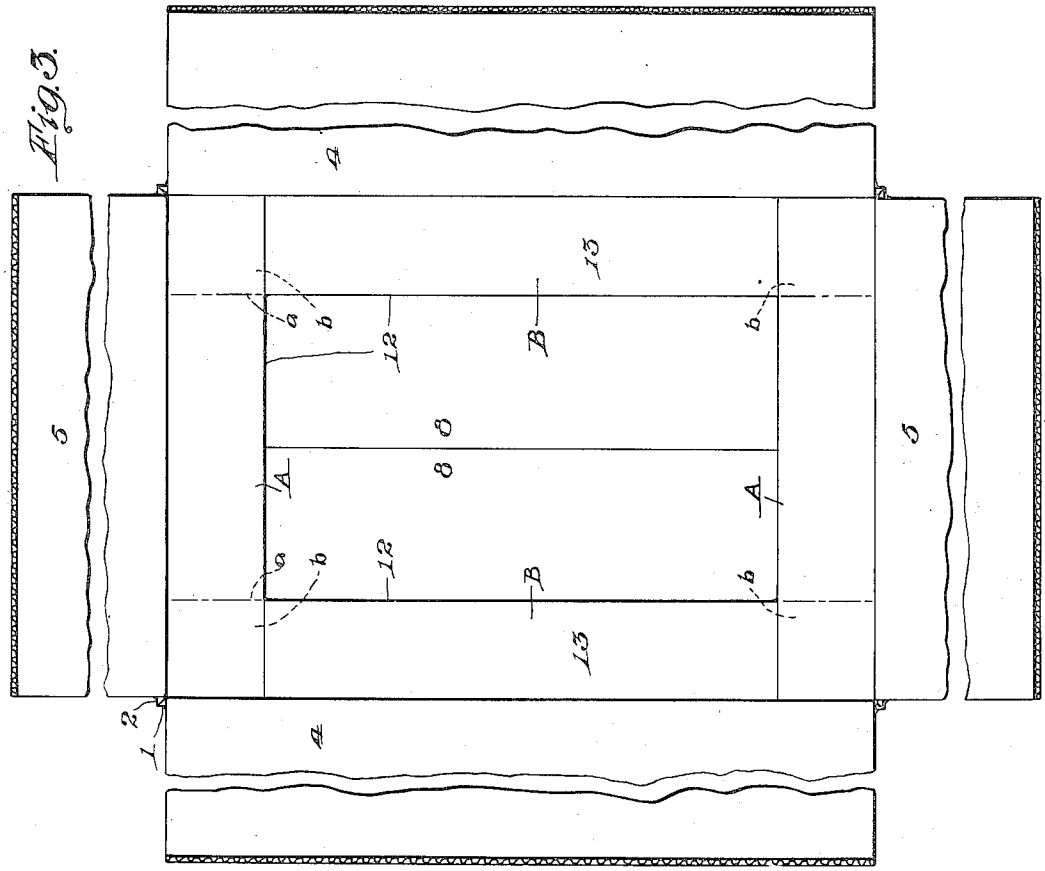
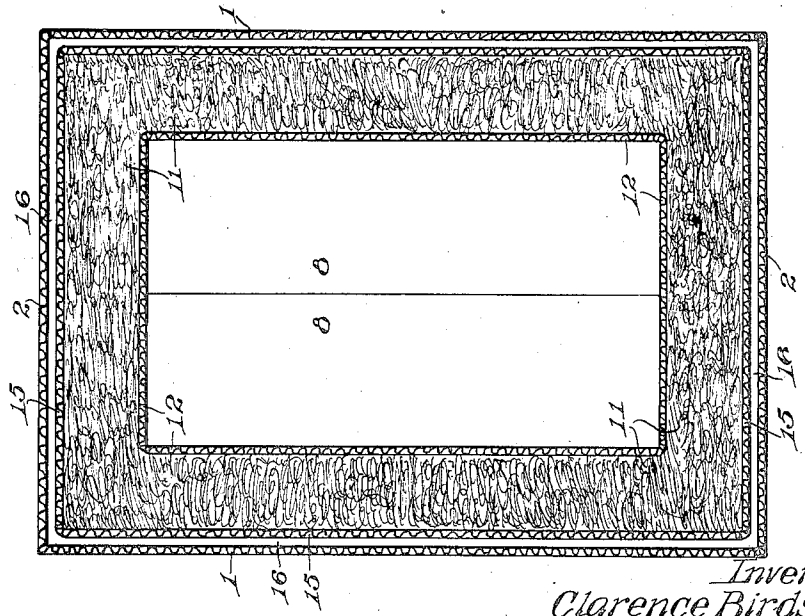


Fig. 4.



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HEAT INSULATED SHIPPING CONTAINER

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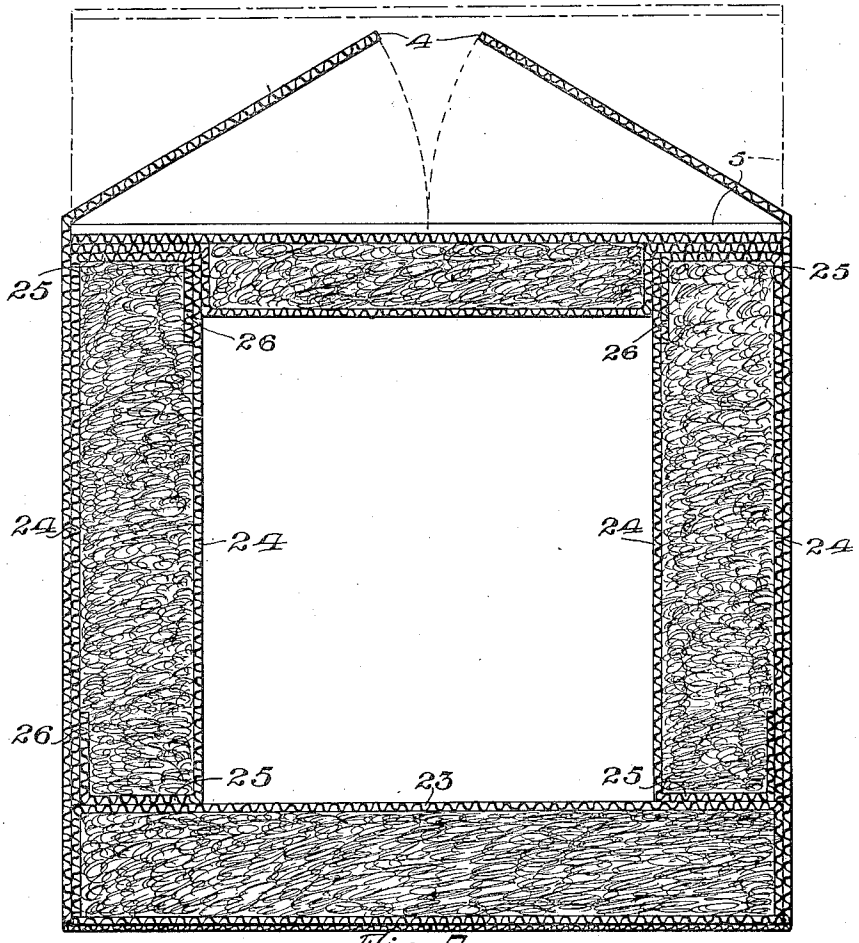


Fig. 5.

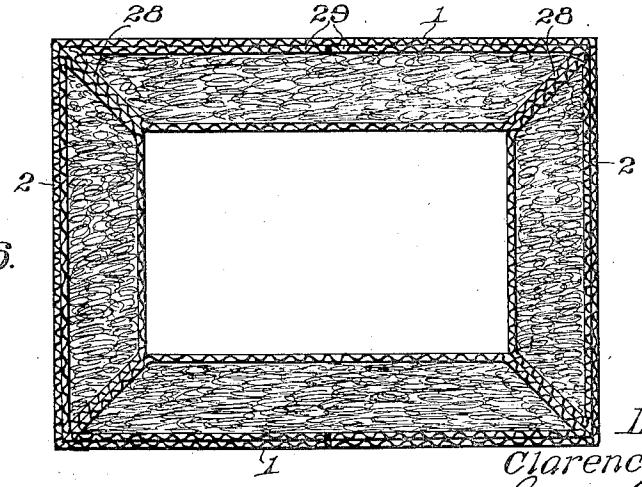


Fig. 6.

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Patented Feb. 24, 1925. 1,527,167

UNITED STATES PATENT OFFICE.

CLARENCE BIRDSEYE, OF YORKTOWN HEIGHTS, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO FORT WAYNE CORRUGATED PAPER CO., OF FORT WAYNE, INDIANA.

HEAT-INSULATED SHIPPING CONTAINER.

Application filed October 7, 1922. Serial No. 592,938.

To all whom it may concern:

Be it known that I, CLARENCE BIRDSEYE, a citizen of the United States, residing at Yorktown Heights, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Heat-Insulated Shipping Containers, of which the following is a specification.

The object of this invention is to provide an improved container for edible articles, particularly perishable foods, which by reason of their nature must be maintained at, below, or above a given temperature for a considerable time, as for instance, until used by, or at least until sold to, the consumer, in order to prevent decay or putrefaction, or to preserve their characteristic flavor, tenderness, general freshness, etc.

Another object is to provide such a container with walls which are filled with suitable relatively incompact heat-insulating material, which prevents air from circulating through said walls, the said material and the so-called dead-air spaces, thereby forming a highly efficient heat-insulating medium, said material for many reasons preferably being of a fibrous nature.

A further object is to provide a container of this character, but formed of the least expensive yet highly suitable materials which are especially adapted for shipping, as by express or even through the parcel post of the mail service, and which are sufficiently inexpensive to produce as to make it unnecessary to provide for the return of the containers.

A still further object is to provide a container having heat-insulating walls composed of sectional units, which are removably inserted within the surrounding walls of an outside container, together with further novel details of construction and operation as hereinafter fully brought out, when read in conjunction with the accompanying drawings, in which Fig. 1 is a vertical transverse section through a shipping container embodying the present invention in one of its preferred forms ; Fig. 2 is a perspective view showing a heat-insulating inner lid for such a container; Fig. 3 is a top plan view of this type of container with the inner lid of Figs. 1 and 2 removed and exposing the interior of the container devoid of contents; Fig. 4 is a horizontal section on the line 4—4 of Fig. 1; Fig. 5 is a vertical transverse view of a shipping container somewhat similar to that shown in Figs. 1 to 4 inclusive, but illustrating wall units which are of themselves formed differently than previously illustrated; and Fig. 6 is a horizontal sectional view of a still further form showing another modification of the side wall insulating units.

Referring to the drawings, in the embodiment of the invention used for an illustration, an outside container is provided, the same constituting double-faced corrugated board, and comprising upwardly extending, oppositely positioned side walls 1, connected by end walls 2, said walls co-operating to surround a compartment which is closed at its bottom by means of any suitably arranged flaps 3, while the upper edge portions of the side walls 1 are provided with inwardly extending longitudinally mounted flaps 4, which extend across and normally maintain in operative closed position a pair of flaps 5, which are hingedly mounted upon the upper edge portions of the end walls 2. however, practically innumerable forms of container constructions can be employed in addition to that specifically described.

For the purpose of providing a false bottom and a heat-insulating wall within the bottom of the container thus described, there are provided preferably a pair of inverted cup-shaped members which are inserted into the surrounding container, either independently, or may be made from a single piece of corrugated board. The latter construction is illustrated in Fig. 1, wherein a base portion 6 of corrugated board is provided, while adjacent to the laterally opposite edge portions of which extend upwardly parallel sections 7, which at their upper limits are folded inwardly, to form horizontally extending sections 8, which lie in a common plane, each of said horizontal sections being thence turned downwardly and parallel with each other to form inverted cup-shaped containers for portions of the insulating material, and at the same time providing a substantially rigid or unyielding support 9, for preventing the horizontal sections 8 from sagging under the weight of the contents of the container. This arrangement may obviously be inverted

so that the sections 6 and 8 are transposed one with the other.

Such a bottom heat-insulating member, formed either of separate units, or of a single piece of corrugated board as described, is filled with any suitable form of inexpensive preferably fibrous heat-insulating material 10—10′, such for instance as kapok, between the base 6 and upper horizontal sections 8, and also upon the opposite sides of the centrally positioned supporting sections 9, and between the upwardly extending oppositely positioned sections 7, the kapok being prevented from its being shaken out of the ends of this bottom member by downwardly directed extensions of the sections 8.

Adjacent to the inner surfaces of the side and end walls 1 and 2, respectively, of the container are positioned heat-insulating units likewise in this construction made of corrugated board and kapok 11, the said board comprising an upwardly extending inwardly positioned section 12, folded outwardly at its upper and lower extremities to form substantially parallel sections 13, which terminate outwardly in respectively downwardly and upwardly folded sections 14 which repose flat against the inner surfaces of the outside container walls.

These last-named sections 14 also maintain in operative position a section of board 15, which operates to retain the kapok 11 within the side wall units, and as seen in Figs. 1 and 4, provides a dead-air space 16 between each of said boards 15 and the adjacent container walls 1 or 2, as the case may be. This construction of the side walls also permits articles to strike or impinge against the outside surfaces of the container walls during the usual more or less rough handling to which containers are subjected, without the blow being conveyed to the insulating unit, or in most instances even to the neighboring sections 15. This result is produced by virtue of the fact that the elasticity, yet relative rigidity, of the walls 1 and 2 absorb a considerable portion of substantially any blow which they may receive, so that any small portion of the blow which might continue through and be imparted to the sections 15 would be so reduced in strength as to prevent any material injury to the latter section.

However, even if both the container wall and insulating unit sections 15 should become punctured, the filler is of such nature as substantially or entirely to prevent its bulk from escaping through such opening as might be made, especially in the case of such long fibered materials as kapok, hair, cotton, linters, etc., but somewhat less so with relatively finely divided cork, saw-dust, bran and the like. The interior storage space 17, shown in the drawings, is normally filled with perishable materials packed in any suitable manner, after which the inner lid (Fig. 2) is placed over the said contents in such manner as to provide a heat-insulating unit closure for the top of the container.

This closure consists preferably of a plane section 18, made of corrugated board in the form shown, parallel with, yet in spaced relation from, a section of similar board 19, between which boards is retained kapok or other insulating material 20. The opposite end portions 21 of the section 19 are folded in parallel relation and extend toward the member 18, terminating in flanges 21ª secured to the marginal portions of the member 18 by means of staples 22 or other suitable fastening means. After placing the inner closure in position as shown in Fig. 1, the container flaps 4 and 5 are folded into position and secured in any suitable manner, as by means of cord, adhesive tape, or the like.

Relative to the formation of the laterally positioned heat-insulating lining within the preferred embodiment of this invention, reference is made to Fig. 4 for a better understanding of the sections 12 of the said lining, which latter are shown as comprising a single, angularly bent, continuous corrugated board member; the upwardly extending sections 15 being formed from a continuous, angularly bent corrugated member, separated substantially uniformly from the container walls 1 and 2 by a continuous relatively slender air space 16; and the filler 11 likewise being continuous circumferentially of the box between the members 12 and 15.

Referring now to Fig. 5, an outside container is illustrated as comprising the same elementary parts as that hereinbefore described. The bottom heat insulating unit 23 however is illustrated as being without any central supports, such as the sections 9 illustrated in Fig. 1. This latter construction being permissible where the contents to be shipped are relatively light in character, or where by reason of the nature of the filler used or the degree with which it is stuffed in position, the insulating unit is sufficiently strong to support the contents of the container.

The inner closure shown in this form is similar to that hereinbefore described, while, however, the laterally positioned wall insulating units are formed in a slightly different manner. Each of these units comprises two pieces of preferably corrugated board, which in cross-section are represented by the letter "I," each comprising a shank 24 and a horizontally extending section 25, which terminates in a relatively shorter section 26, which is parallel with and abuts in each case against the free end portion of the shank 24 of the other piece of the corrugated board. The two pieces or sections of corrugated board are preferably secured

together after the space therebetween is filled with kapok or other insulating material.

Referring to Fig. 6, the outer or surrounding container is also similar to those hereinbefore described, while the walls of the container as a completed unit are made heat-insulating in character by inserting within the container and adjacent to the sides and ends thereof sections of corrugated board, which are formed hollow and filled with kapok or other fibrous heat-insulating material. Each of these heat-insulating units comprises preferably an inwardly positioned vertically extending sections 27, having end portions 28 which diverge outwardly and extend into the angular corner portions of the surrounding container, whence each section is folded so that the end portions 29 lie in a common plane closely adjacent to the outside container walls 1 and 2, respectively.

The lower extremity of each of these units is closed by contact with the heat-insulating unit lying upon the bottom of the container, while the upper portions of the laterally positioned units are closed in any suitable manner as by means of extensions of the board forming the inner compartment walls 27, but which detail is not necessary to illustrate.

In each of the forms of shipping-container herein described, it is to be noted that, while the device is sufficiently inexpensive to make its preservation and return unnecessary as compared with many more expensive containers used for the purpose of shipping perishable edible articles or materials, requiring to be maintained at or near given predetermined temperatures, each of the heat-insulating units on the other hand has been so designed as to be replaceable in the event that it is materially damaged in transit and it is desired to preserve the complete container intact.

Having thus described my invention, what I claim and desire to protect by Letters Patent of the United States is:—

A container, comprising a casing, a lining for said casing comprising units filled with a relatively loose fibrous material to form dead-air heat-insulating spaces surrounding the interior of said casing, each of the units adjacent the side walls of said casing being formed of an upright section of fibre board spaced from the walls of the casing and at its upper and lower ends directed outwardly and thence towards each other to form flanges lying against the inner surface of the casing, and a separate section of fibre board parallel with but spaced from the adjacent surface of said casing by said flanges to provide a hollow dead-air space and pneumatic cushion immediately within the walls of said casing and substantially surrounding said lining units.

In testimony whereof I have affixed my signature.

CLARENCE BIRDSEYE.