June 6, 1944. E. F. COSTIGAN 2,350,673

COLLAPSIBLE CRATE

Filed Oct. 26, 1940 2 Sheets-Sheet 1

Fig. 1.

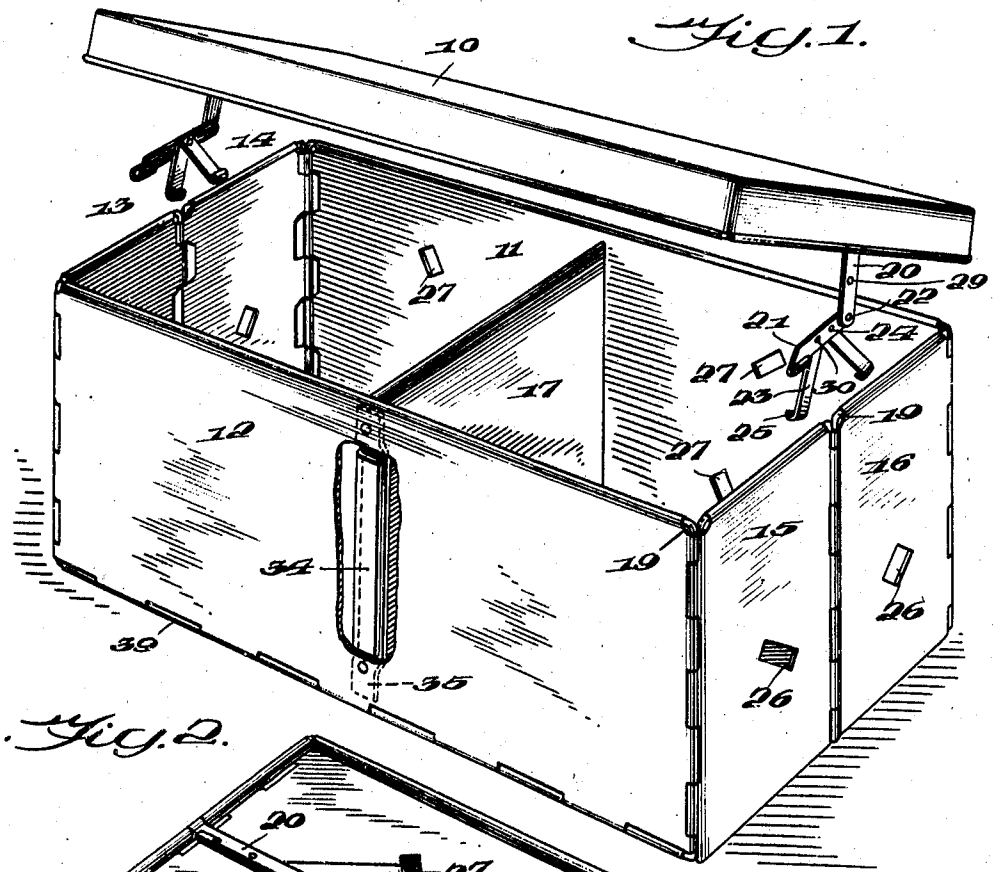

Fig. 2.

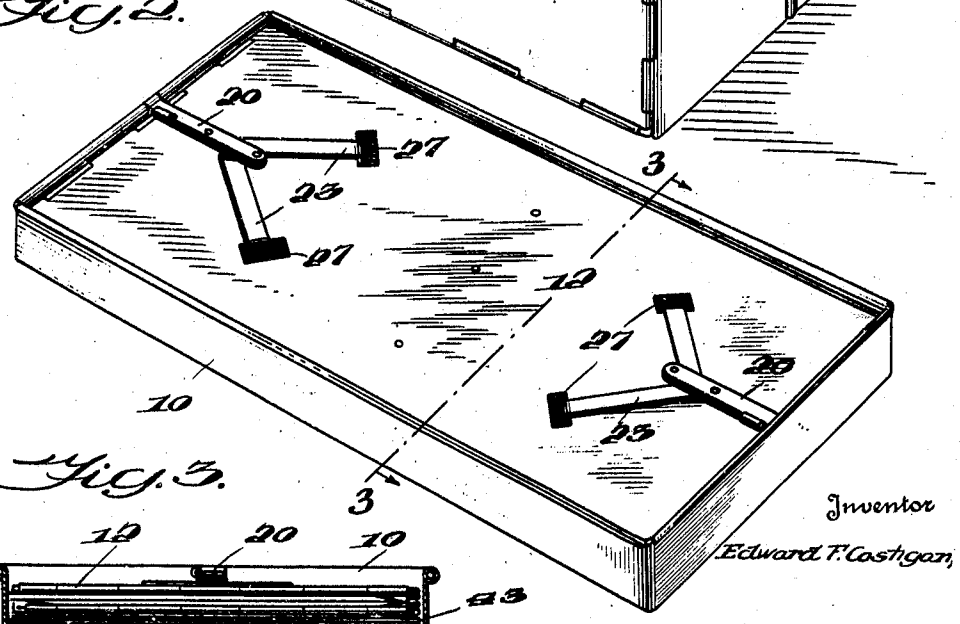

Fig. 3.

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Filed Oct. 26, 1940 2 Sheets-Sheet 2

Fig. 4.

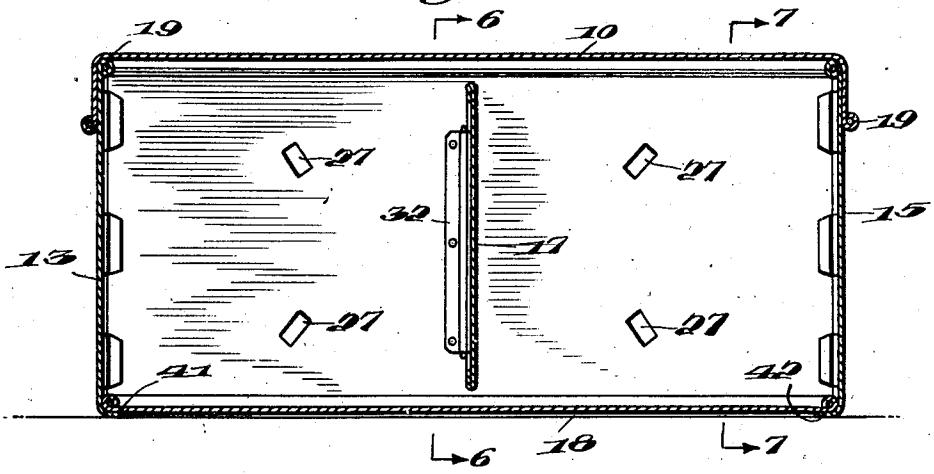


Fig. 5.

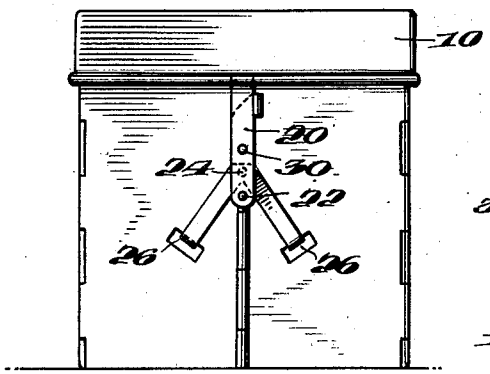


Fig. 6.

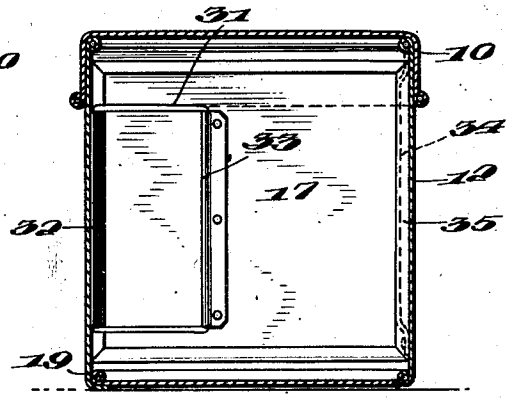


Fig. 7.

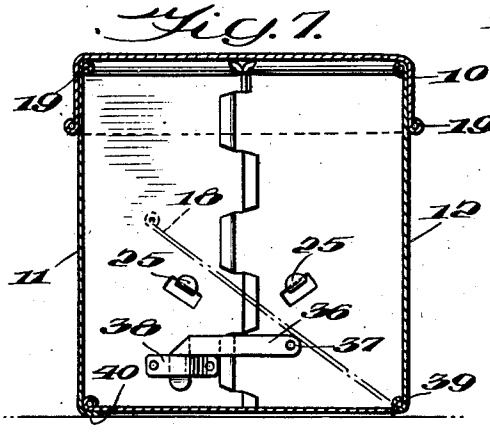
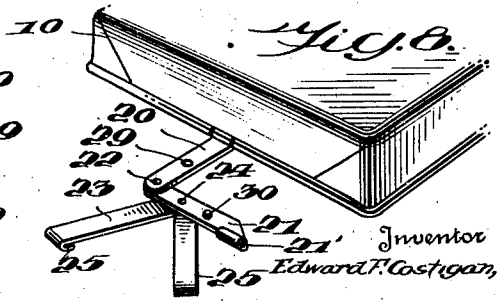


Fig. 8.



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COLLAPSIBLE CRATE

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Application October 26, 1940, Serial No. 363,052

2 Claims. (Cl. 220—55)

This invention relates to collapsible crates and more particularly to collapsible egg crates in which the frame parts may be folded and locked into collapsed position for storage or return transportation in a novel and efficient manner.

One important object of the present invention is to provide an improved collapsible crate constructed and arranged to accommodate the usual filler and spacer partition members in a novel and efficient manner.

Another object of the present invention is to provide a collapsible egg crate of sheet metal which shall be light in weight, simple, and durable in construction and more conveniently collapsed than similar devices now in use.

Another object of the present invention is to provide a novel lid locking means for the crate which shall lock the lid when the crate is extended for shipping purposes and also lock the lid when the crate is collapsed into folding position.

Another object of the invention is to provide a novel form of ventilation means for the crate.

Another object of the invention is to provide a novel form of collapsible middle partition for the crate which shall be permanently attached to one side of the crate.

These and other objects of the invention will be more apparent in the following specification and drawings and particularly set forth in the claims.

In the drawings:

Fig. 1 is a perspective view of a collapsible crate embodying the present invention;

Fig. 2 is a perspective view of the crate in the collapsed position;

Fig. 3 is a sectional view on line 3—3 of Fig. 2;

Fig. 4 is a sectional view in elevation of the crate;

Fig. 5 is an end elevational view;

Fig. 6 is a sectional view on line 6—6 of Fig. 4;

Fig. 7 is a sectional view on line 7—7 of Fig. 4; and

Fig. 8 is a perspective view of the lid latching and locking means.

Referring to Figs. 1, 2 and 3 of the drawings there is shown a two compartment collapsible egg crate constructed and arranged in accordance with the present invention. In this embodiment of the invention the crate is preferably made of sheet metal and includes primarily a lid closure in the form of a receptacle 10, collapsible side members 11 and 12, foldable end members including hinged sections 13, 14, 15 and 16 respectively, a collapsible mid partition member 17 and a hingedly connected bottom member 18, Fig. 7. The edge portions of the sheet metal members forming the crate parts are preferably turned over an edge binding wire indicated generally by the numeral 19. This edge binding wire not only forms adequate reinforcing but also provides a convenient hinge member for the foldable parts of the crate, connected in the manner illustrated.

Another important feature of the present invention is that the lid member 10 is in the form of a receptacle and is formed from a single piece of stamped metal so as to provide a shallow receptacle for receiving all the collapsed crate parts including the filler and spacer members usually associated with an egg crate of the character designated. This arrangement is particularly important in that it provides a complete egg crate wherein all of the parts necessary for packing and shipping eggs are always retained in ready access for shipping purposes.

Referring to the particular construction and arrangement of the several parts of the crate, it will be noted that in the extended position, the lid 10 is locked to the outside portions of the respective end members and when in the collapsed position, the crate members are all locked inside the lid receptacle. When the crate is collapsed the same locking means is swung inwardly to engage a foldable side portion contained within the open side of the lid receptacle. This side portion forms a closure side for the lid receptacle as hereinafter more fully described.

Another important feature of the present invention is the locking means for the lid. This locking device includes a hinge member 20 mounted on the reinforcing wire rim 19 of the lid and is pivotally connected to an extension handle and lever member 21. The handle member is connected to the extremity of hinge member 20 by a pivot connection 22. The handle lever 21 is also pivotally connected near its midportion to a rigid V-shaped latching member 23 by a pivot connection 24. The outer extremity of each of the arms of the V-shaped member is provided with a hook member 25. These hook members 25—25 are turned inwardly and arranged to engage correspondingly arranged and angularly disposed rectangular shaped slot openings 26—26 in the end members of the crate. Similarly arranged apertures 27—27 are spaced in one of the members 11 of the crate, so as to provide locking means when the crate is collapsed. These openings in the side and ends of the crate are also of such a size that will pro-

vide adequate ventilation of the crate at each end thereof and also in the end compartment formed by the partition plate 17.

An important feature of the arrangement of the locking means is such that it shall require positive operation so as to prevent any accidental opening of the same during transportation. The hinge member 20 is provided with an aperture or notch 29 near the mid-portion thereof and the pivotally connected lever 21 is provided with a projection stud 30 for registering and locking with the aperture 29 when the lid is locked in either the extended or collapsible crate condition. The lock parts 20 and 21 are made of strap metal which has inherent resiliency and the stud 30 is sprung or snapped into the aperture 29 by action of the lever 21 when it is brought into alignment or overlapping relation with the hinge member 20. This specific form of locking means is shown in the open position in Figs. 1 and 8 and in the closed or locking position in Figs. 2 and 5. It will be noted that this arrangement provides a lever operated snap lock for the lid member, either in the open or closed position so that the same cannot be opened by ordinary vibration caused by rough usage experienced in the handling of these crates. In other words the latch must be physically or forcibly opened by lifting or prying the stud 30 out of the notch 29 whenever it is desired to open the crate. The lever 21 is provided with a knob 21' to facilitate operation thereof.

Referring to the specific construction and arrangement of the mid-partition 17, this is foldably mounted so that when it is desired to fold the crate, the partition may be conveniently hinged within the crate and retained as an integral part thereof, as well as occupying a minimum amount of space. The mid-partition 17 is of sheet metal and is hinged to the inside of the side member 11, for example, by means of a rectangular wire frame 31. The frame member 31 is hingedly connected to the side 11 by a hinge strap member 32 and to one side of the center of the partition member 17 by a similar form of hinge strap 33. This off-center hinge 33 is for the purpose of enabling the partition 17 to be folded against the side 11 and retain the extreme end edges of the partition within the length of the side member 11. In the standard double egg crate, this portion is wider than half the length of the crate, therefore, if it is desired to make the partition a permanent fixture, it is necessary to provide for the difference of width to length when the parts are folded.

The free end of the partition 17 is secured against the opposite side 12 by means of a right angularly disposed side flange member 34 forming an integral part thereof. This flange is adapted to slip under a vertically disposed metal strap member 35 provided on the side 12 and spaced therefrom to receive the member 34 as shown in Figs. 1 and 6. This construction enables the partition edge 34 to be rigidly retained throughout its width or substantially the full depth of the crate side and provide a rigid center partition brace for the crate.

The crate sides, ends, and bottom are retained in extended position by means of a hook shaped latch clamp 36 pivotally connected to the ends as indicated by the numeral 37 and a keeper member 38 secured to an end portion on the opposite side of a hinged end section as shown in Fig. 7. This construction also strengthens the end hinged section and holds the parts rigid.

It will be noted that the sides and ends of the crate are all hinged together as shown in Fig. 1. The bottom is hinged to one side, as indicated by the numeral 39 and the other edge rests on an inwardly extending flange portion 40 formed on the bottom edge of side member 11. The bottom edges of the end section members are also provided with inwardly extending flanges 41—42 respectively, Fig. 4.

Having thus described a collapsible crate made entirely of sheet metal, it will be noted that the several parts are adequately braced so as to form a rigid structure when in the extended position and also a more compact receptacle when in collapsed position for return shipment or storage as is customary in crates of this kind. It will be further noted that a crate constructed and arranged in accordance with the present invention not only provides for retaining the mid-partition fixed to the crate but also provides for accommodating all of the filler and spacer partition member 43 which are necessary for transporting or shipping eggs in a crate of this kind.

When the crate is in the extended position, it will be noted that the rigid V-shaped member 23 with the hook arms 25—25 span the hinge section of the end members and engage the notches 26—26. This locking member 23 also cooperates with the inside latching member 36 to provide the collapsible or hinged member with a maximum rigidity. The lid 10 is clamped to the end members as shown in Fig. 5.

When it is desired to collapse the crate, the middle partition is folded to one side, the bottom raised as indicated in Fig. 7 and then the end sections are folded inwardly. The filler and spacer members are now folded and placed in the lid 10, and then the folded crate parts are placed in the lid so that the side, with the openings 27—27, forms the closure for the open side of the lid. The locking devices are now folded over and the V arms 23—23 are placed so that the aperture hooks 25—25 engage the openings 27—27. The parts are then clamped by drawing the lever 21 until the knob 30 snaps into the opening 29 to securely lock the parts together.

Having thus described a preferred embodiment of the invention it is obvious that various changes may be made therein without departing from the invention as set forth in the claims.

What I claim is:

1. The combination with a receptacle having a lid, of similar means at each end of the lid for locking the lid in position, each of said means including a metallic strap member pivotally hinged at one end to the lower edge of one end of the lid, a lever member having one end pivotally connected to the other end of the strap member and arranged to swing at right angles to the lid hinge pivot, a hook member pivotally connected to the mid-portion of said lever member, the side of the receptacle having formed therein a pair of notches, said hook member comprising a pair of arms terminating respectively in hooks for engaging said pair of notches, and means for spring latching the strap and lever members together in overlapping relation to hold the arms in retracted position to engage the hooks in the respective notches.

2. Apparatus of the character designated in claim 1 in which the hook member is V-shaped.

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