United States Patent

[11] **3,632,007**

[72] Inventor **Itzhak Kantor**
Hof Hacarmel, Israel

[21] Appl. No. **882,128**
[22] Filed **Dec. 4, 1969**
[45] Patented **Jan. 4, 1972**

[73] Assignee **Plasson Maagan Michael Industries Ltd.**
Hof Hacarmel, Israel

[54] **DOOR LATCH**
6 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **217/57,** 292/175, 217/36
[51] **Int. Cl.** **B65d 43/16**
[50] **Field of Search** ..... 217/57, 36; 220/83, 31, 35, DIG. 14; 292/175, DIG. 38, 171, 163

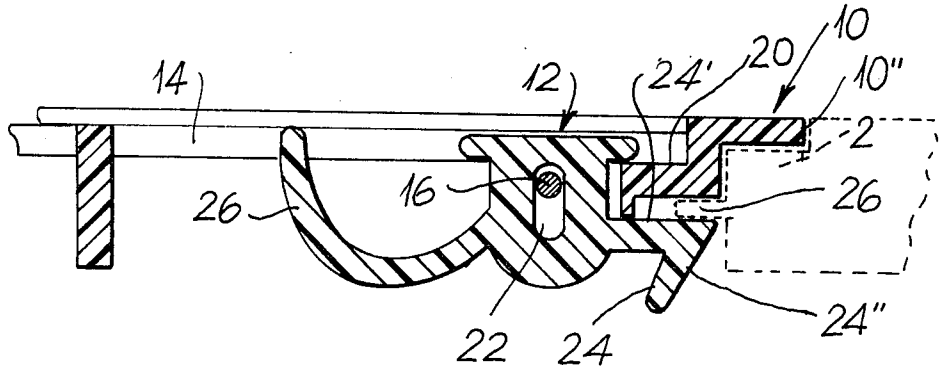
[56] **References Cited**

UNITED STATES PATENTS

1,521,572	12/1924	Hammer et al.	292/175
2,221,110	11/1940	Ross	292/175 X
3,014,608	12/1961	Aylor	217/57 UX
3,407,961	10/1968	Box	220/31 R X

Primary Examiner—Raphael H. Schwartz
Attorney—Benjamin J. Barish

ABSTRACT: A door and latch particularly for poultry crates, the door being formed with a rectangular-shaped opening in which the latch is movable and is spring urged to its closed position. The latch includes a latching element depending from the inner face of the door and formed with an inturned lip which serves as a camming surface automatically latching the door when closed. The latch further includes a finger piece extending upwardly from the outer face of the door for manually unlatching it against the action of the spring. The latter is constituted by a resilient rod passing through the latch, the opposite ends of the rod being receivable in seats formed in the door on opposite sides of the rectangular opening.



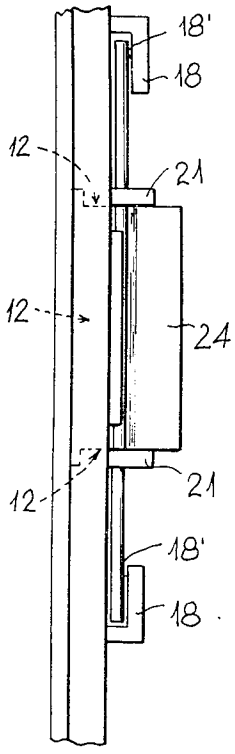


FIG. 3

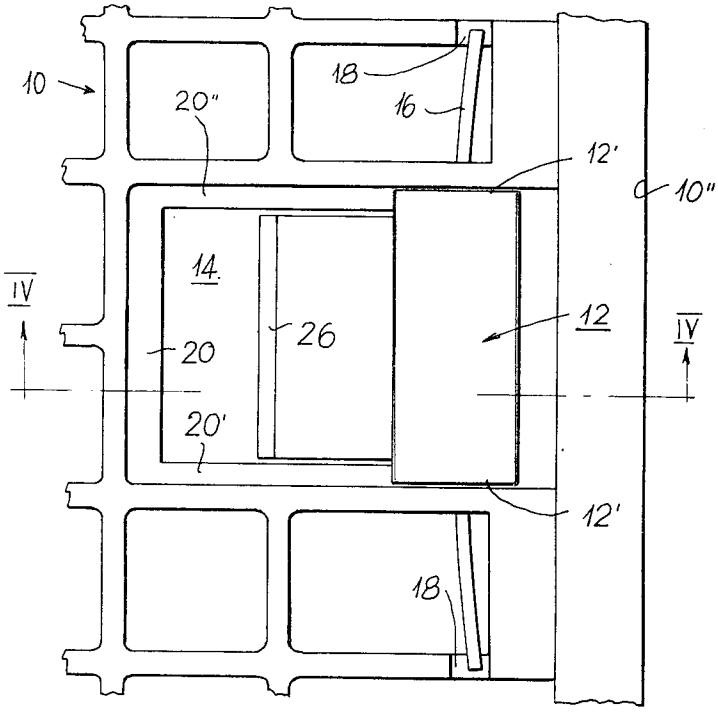


FIG. 2

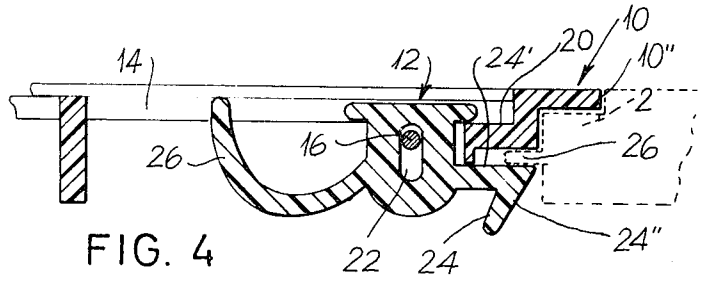


FIG. 4

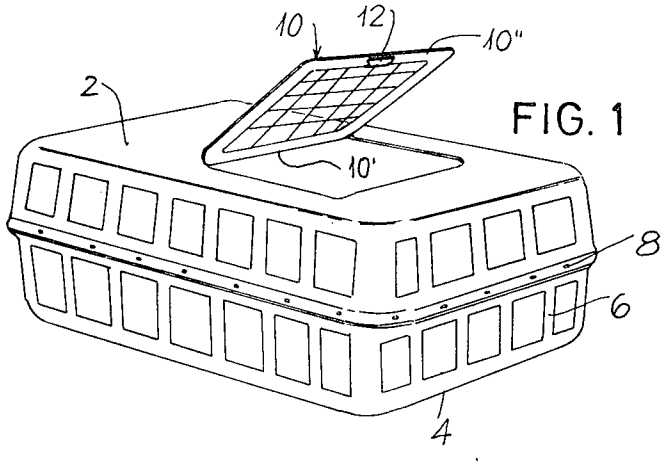


FIG. 1

INVENTOR
ITZHAK KANTOR

BY Benjamin J. Barish

ATTORNEY

DOOR LATCH

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a door and latch therefor, and also to a poultry crate including such door and latch.

2. Description of the Prior Art

Plastic poultry crates are now widely used, and a number of door and latch arrangements have been devised for such crates. Some of the most widely used door and latch arrangements are not automatically self-latching (i.e., upon closing the door); others are difficult to disassemble for repair purposes; and still others are made of a number of relatively complicated and costly parts.

An object of the present invention is to provide a door and latch of a novel construction having advantages in all the above respects. A further object is to provide a poultry crate utilizing such door and latch.

BRIEF DESCRIPTION OF THE INVENTION

The invention provides a door and latch in which the door is formed with a rectangular-shaped opening and the latch includes a latch member disposed in the opening and movable by a spring to latching position. The latch member includes a latching element depending from the inner face of the door and formed with an inturned lip the outer surface of which constitutes a camming surface automatically latching the door closed when the door is permitted to fall. The latch member is further formed with a finger piece extending upwardly from the outer face of the door for manually moving the latch member to the unlatching position against the action of the spring.

According to a further feature, the spring comprises a resilient rod passing through the latch member, the opposite ends of the rod being receivable in seats formed in the door on opposite sides of the rectangular opening.

According to still further features, the seats are formed with open slots to facilitate removal and dissembly of the latch. In addition, the rectangular opening is circumscribed, on at least the two opposite sides thereof parallel to the movement of the latch member, by a rim of reduced thickness, the latch member being formed with an integral extension on each side thereof slidable on one face of the rim for guiding the movement of the latch member. Separate guide elements are further provided, these being slidable on the opposite face of the rim and in alignment of each of the integral extensions.

Further features and advantages of the invention will be apparent from the description below.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is herein described, by way of example only, with reference to the accompanying drawings, wherein:

FIG. 1 illustrates a plastic poultry crate constructed in accordance with the present invention;

FIG. 2 is a top plan view of a part of the door and latch used in the poultry crate of FIG. 1;

FIG. 3 is an end view, looking from the right-hand end, of the door and latch of FIG. 2; and

FIG. 4 is a sectional view along lines IV—IV of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The poultry crate illustrated in FIG. 1 is made of molded plastic material and includes a top wall **2**, a bottom wall **4** and four sidewalls **6**. This type of crate is made in two halves which halves are secured together by plastic pins **8**. A door and latch construction in accordance with the present invention is mounted in the top wall **2** of the crate and serves as the closable lid therefor. The door is indicated at **10** and the latch at **12**. The door **10** is pivotably mounted along one edge **10'** of the top wall **2** of the crate, the latch **12** being positioned close to the opposite or closing edge **10''** of the door.

All the walls of the crate are preferably made of an open construction, such as shown by sidewalls **6** and door **10** (but now shown in top wall **2**, FIG. **1**).

Door **10** is formed with a rectangular opening **14** adjacent to its closing edge **10''**. Latch **12** is disposed in this opening and is movable therein toward and away from door edge **10''**. A spring **16**, in the form of a resilient rod passing through the latch member, biases the latch member to the latching position, i.e., toward door edge **10''**.

The ends of resilient rod **16** are receivable in seats **18** formed in the door adjacent to edge **10''**, on opposite sides of rectangular openings **14**. Seats **18** are formed with open slots **18'**, the openings facing door edge **10''**. This facilitates insertion and removal of resilient rod **16**, which enables the latch to be assembled and disassembled in a quick and facile member as will be described more fully below.

Openings **14** in door **10** is circumscribed on its four sides by a rim **20** of reduced thickness with respect to the bordering areas of the door. While all four sides of the rim are so reduced, it is actually only necessary to provide the reduced thickness to the two opposite sides of the rim parallel to the movement of the latch member, i.e., those indicated at **20'**, **20''** in FIG. **2**.

Latch **12** is formed of a single integral piece of plastic and includes a transverse opening **22** through which spring rod **16** passes; a latching element **24** depending from the inner or lower face of the door; and a finger piece **26** extending upwardly from the opposite or outer face of the door for manually moving the latch member to its unlatching position.

Latching element **24** is formed with a horizontal shoulder **24'** and a depending inturned lip **24''**. The outer surface of lip **24''** serves as a camming surface engageable with a fixed element in the path thereof when the door is closed. In this case, the fixed element is the rim **26** formed in the top wall **2** of the crate engageable by the latch when the door is closed.

It will be seen that when the door **10** is dropped against rim **26** of the top wall **2**, camming surface **24''** of latching element **24** will first engage rim **26**, moving latch **12** away from edge **10''** of the door (i.e., leftwardly in FIG. **4**) until the top horizontal surface **24'** of the latch clears rim **26**, at which time resilient rod **16** will return the latch (rightwardly in FIG. **4**), so that horizontal surface **24'** of the latch underlies rim **26**, whereby the door is latched closed. Thus, merely dropping the door **10** on the top wall **2** automatically latches the door closed.

Latch **12** is formed on its upper surface with integral lateral extensions **12'** slidable on the upper face of the borders **20'**, **20''** for guiding the movement of the latch. At the underside of the latch the movement is guided by a pair of separate guide elements **21** slidable on the opposite face of the rim and in alignment with extensions **12'**. Resilient rod **16** also passes through openings in these guide elements These elements are made separate from, rather than integral with, latch member **12** in order to facilitate the assembly and disassembly of the latch within opening **14** of the door.

The latch is easily opened by placing a finger or thumb against finger piece **26** and moving it away from door edge **10''** against the action of resilient rod **16**. This opening movement, as well as the later closing movement, of the latch is guided by the sliding of extensions **12'** and guide elements **21** on the opposite faces of rim sides **20'**, **20''** bordering the rectangular opening **14** in the door.

In order to close the door, it is only necessary to permit it to drop whereby it will automatically latch closed by its own weight, in the manner described above.

To assemble the latch, latching member **12** is inserted from above into the rectangular opening **14** in the position illustrated, with the integral extensions **12'** against the upper face of rim sides **20'**, **20''**, and the separate guide elements **21** on the lower face of the rim sides. Resilient rod **16** is then passed through opening **22** in latch member **12**, and in the corresponding openings in the separate guide elements **21**, and the ends of the rod are inserted into seats **18** on opposite sides

of the rectangular opening **14**. As indicated above, the slotting openings **18'** in the seats permit the rod **16** to be snapped into place in a very facile manner.

To disassemble the latch, e.g., for repair purposes, it is merely necessary to remove resilient rod **16** from its seats, whereupon the latch member **12** and the guide elements **21** may be easily removed.

It is thus seen that the latch described utilizes only a very few, simple and inexpensive parts, may be easily assembled and disassembled, and automatically is self-latching on dropping the door.

Many variations, modifications and other applications of the illustrated embodiment will be apparent.

What is claimed is:

1. A door and latch therefor, the door being pivotably mountable along one edge and being formed with a rectangular opening adjacent to its opposite, closing edge, the latch including a latch member disposed in said opening, means supporting said latch member for sliding movement in said opening toward and away from said closing edge, and a spring biasing said latch member to the latching position toward said closing edge, said latch member including a latching element depending from one face of said door and formed with an inturned lip, the outer surface of which constitutes a camming surface engageable with a fixed element in the path thereof when the door is closed, for moving the latch away from said closing edge and then permitting the spring to return the latch to automatically latch the door closed, said latch member also including a finger piece extending from the opposite face of the door for manually moving the latch member to the unlatching position against the action of said spring when manually opening the door, said spring comprising a resilient rod passing through said latch member, the opposite ends of said rod being receivable in seats formed in said door on opposite sides of said rectangular opening.

2. A door and latch as defined in claim **1**, wherein said seats are formed with open slots the open sides of which faces said closing edge of the door to facilitate removal and disassembly of the latch.

3. A door and latch as defined in claim **1**, wherein said rectangular opening is circumscribed, on at least the two opposite sides thereof parallel to the movement of the latch member, by a rim of reduced thickness with respect to the bordering areas of the door, said latch member being formed with an integral extension on each side thereof slidable on one face of said rim for guiding the movement of the latch member.

4. A door and latch as defined in claim **3**, further including a pair of separate guide elements each slidable on the opposite face of said rim and in alignment with one of said integral extensions.

5. A door and latch as defined in claim **1**, wherein said latch member is formed of a single integral piece of plastic.

6. A poultry crate including a door and latch as defined in claim **1**, said crate further including top, bottom and sidewalls, said door being pivotably mounted to the top wall and serving as a closable lid automatically latched closed upon dropping the same onto the top wall.

* * * * *