April 5, 1949. A. R. FERGUSON 2,466,220

COLLAPSIBLE METAL CRATE

Filed Dec. 30, 1946 2 Sheets-Sheet 1

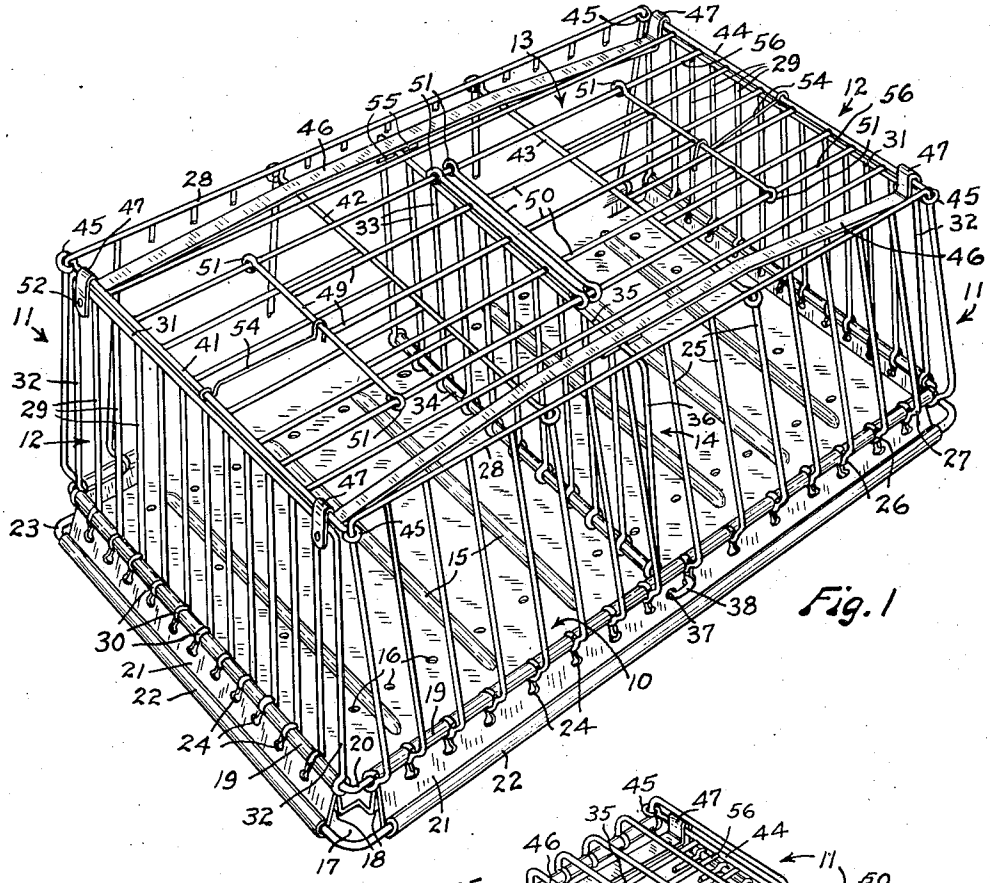


Fig. 1

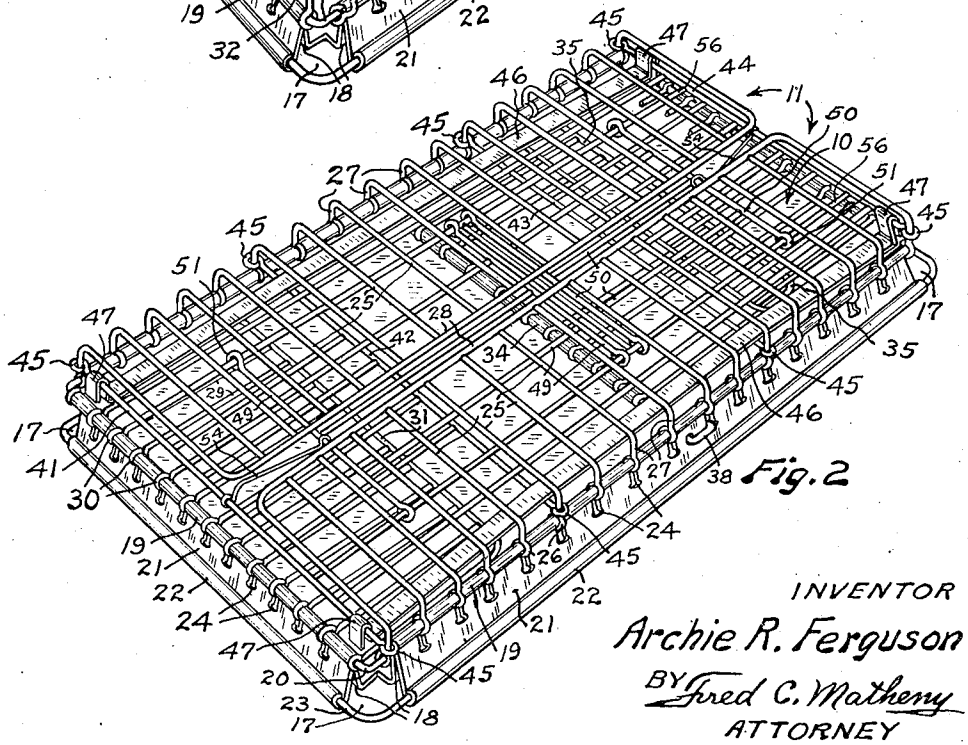


Fig. 2

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COLLAPSIBLE METAL CRATE

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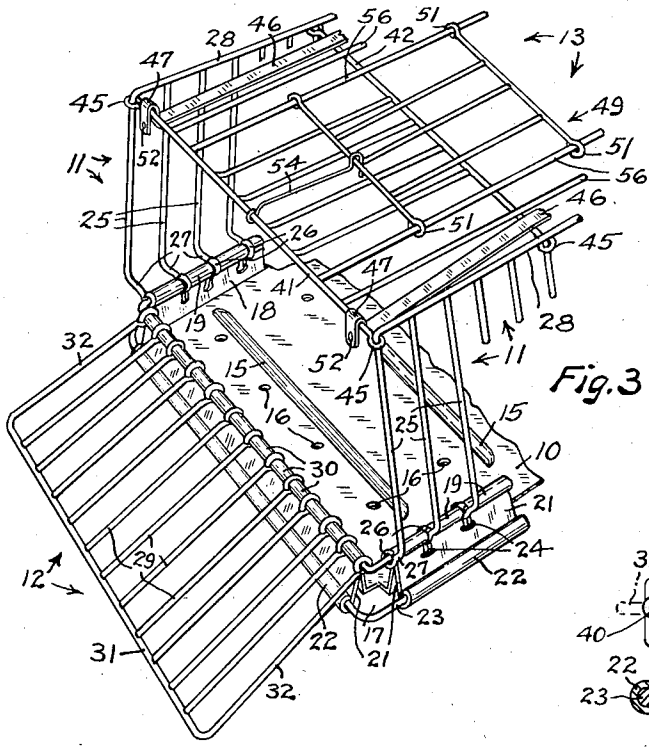


Fig. 3

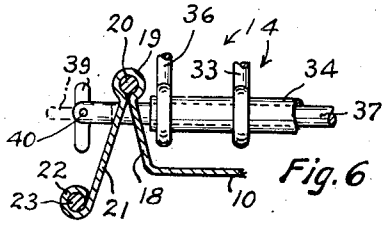


Fig. 6

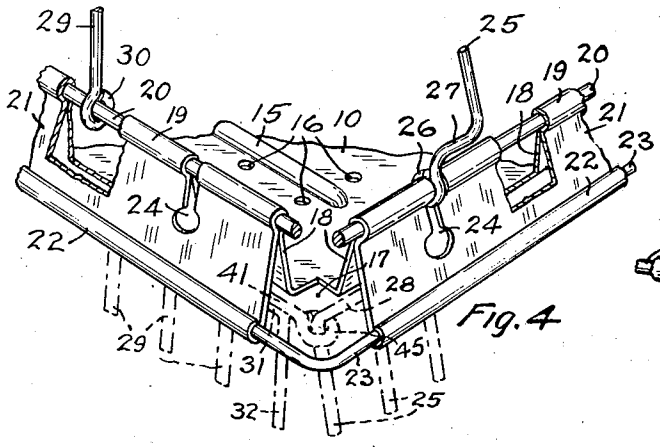


Fig. 4

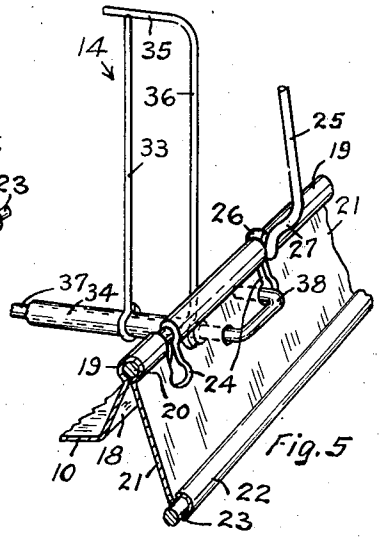


Fig. 5

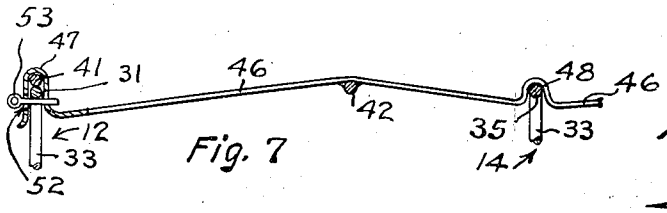


Fig. 7

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COLLAPSIBLE METAL CRATE

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7 Claims. (Cl. 220—19)

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This invention relates to a collapsible metal crate of a type used in the handling and shipment of poultry and animals.

An object of this invention is to provide a collapsible metal crate of strong, simple and durable construction that is not expensive to manufacture, that can be quickly and easily folded into compact form for storage and shipment and that can be quickly and easily unfolded or opened up for use.

Another object of this invention is to provide a crate that is made entirely of metal thus making it sanitary and easy to clean and sterilize.

Another object is to provide a crate having a flanged bottom portion of slightly larger size than the top of said crate whereby when two or more of these crates are stacked one on another the bottom flanges of the upper crates will slightly overlap the sides of the crates on which they rest thus providing stability and preventing relative sliding movement of the crates one on another.

Other objects are to provide a crate having novel and efficient spring means for locking the top of the crate to the ends thereof to hold the several parts of the crate in an open position, to provide a crate having a removable partition therein and to provide a crate having side bars that are outwardly offset near their lower ends for more compact folding.

Other objects of the invention will be apparent from the following description taken in connection with the accompanying drawings.

In the drawings Figure 1 is a perspective view of a collapsible metal crate constructed in accordance with this invention showing the same erected as it would appear when ready for use, parts being omitted to avoid confusion.

Fig. 2 is a view of said crate showing the same in a folded or collapsed condition and with parts omitted to avoid confusion.

Fig. 3 is a fragmentary perspective view showing an end portion of said crate with an end wall thereof opened out into a position it might occupy when poultry or animals are being loaded or discharged from the crate.

Fig. 4 is a fragmentary perspective view showing corner portions of two crates resting one upon another, the parts of the uppermost crate being shown in full lines and the parts of the lowermost crate being shown by dot and dash lines.

Fig. 5 is a fragmentary perspective view, with parts in section, showing means for mounting a folding partition in this crate.

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Fig. 6 is a fragmentary view partly in section and partly in elevation showing another detail of the partition mounting means.

Fig. 7 is a fragmentary view partly in section and partly in elevation showing fastening means for one of the folding end walls and for the medial folding partition of this crate.

Like reference numerals designate like parts throughout the several views.

This crate comprises a crate bottom 10, two crate sides 11, two crate ends 12, a crate top or cover 13 and preferably a removable folding partition 14.

The crate bottom 10 is preferably formed of a flat piece of sheet metal having transverse corrugations 15 therein which increase the stiffness of the bottom 10 and prevent it from sagging and which provide a better non-skid foothold so that the poultry or animals in the crate will not tend to slide around on the bottom 10 as much as they otherwise would. The corrugations 15 are preferably upwardly convexed so they extend above the plane of the bottom 10. Preferably perforations 16 are provided in the bottom 10 to facilitate rapid drainage of liquid.

The corner portions of the bottom 10 are cut away, see Fig. 4, to provide corner notches 17. Between these corner notches 17 the marginal portions of the bottom 10 are bent to form upwardly extending flange portions 18, tubular portions 19 within which a reinforcing wire or rod 20 is disposed, downwardly extending flange portions 21 and other tubular portions 22 within which another reinforcing wire or rod 23 is disposed to form a base. The downwardly extending portions 21 extend a substantial distance below the bottom 10 so that said bottom 10 will be supported clear of the ground or floor.

Slots 24 are provided at spaced intervals in the parts 18, 19, and 21 to facilitate the attachment of the sides 11 and ends 12 to the reinforcing member 20, as hereinafter explained. These slots 24 are preferably punched in the bottom 10 before the marginal portions of said bottom are bent. Preferably the portions 21 are flared outwardly slightly toward their lower edges to provide a base structure that is well adapted to rest on and extend over the top portion of another similar crate, see Fig. 4, in which the lower crate is fragmentarily shown by dot and dash lines.

Each side member 11 is formed of a plurality of parallel bars 25 having at their bottom ends eyes 26 that are positioned in the slots 24 and extend around and are pivotally connected with the reinforcing rod 20 in the upper edge 19 of the mar-

ginal portions of the bottom 10. Adjacent the eyes 26 the bars 25 have outwardly offset portions 27 which facilitate a compact folding of the crate as hereinafter explained. The upper end portions of the parallel bars 25 are rigidly secured to a horizontal top bar 28. The two end bars 25 at the respective ends of each side member 11 are preferably integral with the top bar 28, as shown in Figs. 1, 2 and 3.

Each end 12 comprises upright parallel bars 29 having their bottom end portions pivotally connected by eye members 30 with the base rod 20 and having their top end portions rigidly secured to a horizontal top bar 31. The structure of each end 12 is similar to the structure of the sides just hereinbefore explained except that the upright end bars 29 are slightly shorter than the side bars 25 and do not have any offsets corresponding to the offsets 27 of the side bars 25. The upright bars 32 at the ends of each end section are preferably integral with the top bars 31.

The medial partition 14 comprises upright parallel bars 33 having their bottom end portions secured to a tubular member 34 and their top end portions secured to a horizontal bar 35, Fig. 5, that is parallel with the tubular member 34 and is integral with end bars 36. A rod 37 extends through the tubular member 34 and through the marginal parts 18 and 21 of the bottom 10 thereby pivotally mounting the medial partition in the crate. Preferably one end portion of the rod 37 is reversely bent to form a hook shaped end 38, Fig. 5, and preferably a short latch bar 39 is connected by a pivot 40 with the other end portion of the rod 37 for locking the same when it is crosswise of the rod 37 and for releasing said rod 37 when said bar 39 is turned parallel with said rod.

The crate top 12 preferably comprises a plurality of spaced apart transverse bars 41, 42, 43 and 44 each provided at each end with an eye member 45 that is slidable on the upright bars 25 of the side members 11. Longitudinal bars 56 connect the transverse bars 41, 42, 43 and 44 of the crate top.

Two longitudinally disposed flat bars 46 of spring metal extend along the respective sides of the cover member 13 at right angles to the transverse bars 41, 42, 43, and 44. Each flat bar 46 has a hook portion 47 of inverted U shape on each end thereof. Each hook portion 47 is adapted to releasably fit over one of the end cross bars 41 or 44 of the cover 13 and to also fit over the adjacent top bar 31, of one of the end members 12, see Fig. 7. Each spring bar 46 is rigidly secured to some of the transverse bars, such as bars 42 and 43. Preferably each hook portion 47 is provided with holes 52 through which a pin or bolt 53, Fig. 7, or a tie member can be inserted, if desired, to preclude any possibility of accidental release of the hook portions 47. The pins 53 are omitted in Figs. 1, 2 and 3.

Each spring bar 46 is also provided with means for engaging with the top bar 35 of the partition 14 to hold the partition in an upright position. Fig. 1 shows two spaced apart cleats 55 secured to the bottom side of each spring 46 for this purpose. Fig. 7 shows an integral catch member 48 formed in the spring 46 at the proper location to snap over the top bar 35 of the folding partition 14 and hold said partition in an upright position.

An opening or doorway for the insertion or removal of poultry, animals or the like from the crate is provided in the medial portion of the top member or cover 13. Preferably two sliding doors 49 and 50 are provided for closing this opening, said doors being operable respectively to close the two parts of the opening on the two respective sides of the partition 14. This provides for separate access to the two compartments of the crate for inserting and removing poultry or small animals through the top. The transverse bars of the doors are provided with eye members 51 that slide on the longitudinal bars of the top member. A readily releasable spring hook 54 is provided for securing each door in a closed position.

The crate ends 12 can be opened outwardly, as shown in Fig. 3, in discharging poultry or animals from the crate. Obviously a decking can be placed on a lowered crate end 10 to provide a better surface over which poultry or animals can walk.

If desired the partition member can be removed from the crate. However the partition will ordinarily be used when the crate is used for poultry or small animals. This partition divides the crate into two compartments and thus minimizes crowding and piling up of the poultry or animals and keeps the load in the crate in better balance.

When the crate is not in use it can be compactly folded as shown in Fig. 2. In folding the crate the partition member 14 is first folded down on the floor; the ends 12 are then folded inwardly with one end resting on the partition member and the other end resting on the floor; the top or cover 13 is then lowered and the sides 11 folded inwardly on the top thus reducing the crate to a very compact form for storage or shipment. The parts can be quickly and easily opened out and erected into a position ready for use as shown in Fig. 1. The offset portions 27 of the side bars 25 accommodate the eye members 51 of the top or cover without binding or strain as the sides are folded down on the top.

These crates are strong and rugged in construction and can be stacked one upon another when loaded without danger of crushing the lower crates. When the crates are stacked the flaring bottom portions of each upper crate extends downwardly over the top edges of the crate on which it rests thus preventing each upper crate from sliding around on the crate on which it rests. The upright bars 29 of the ends 12 are straight and act as compression members in supporting the load when two or more crates are stacked one on another. The fastening members 47 on the ends of the springs 46 hold the crate ends in an upright position with the end bars 41 and 44 of the top member resting on the top bars 31 of the end members. Thus the end bars 29 and 32 are always maintained in an upright position for the purpose of supporting a load when two or more loaded crates are stacked one upon another.

Obviously changes in this invention can be made within the scope of the appended claims.

I claim:

1. A collapsible metal crate comprising a substantially flat crate floor; integral marginal flanges on said crate floor, said flanges comprising upwardly projecting portions that extend above the plane of said crate floor, rolled tubular portions at the upper extremities of said flanges; and downwardly projecting outwardly flared portions extending from said rolled tubular portions to a position below the plane of said floor; a reinforcing member in said rolled tubular

portion extending around said crate; and folding side and end members pivotally connected with said reinforcing wire.

2. A collapsible metal crate comprising a substantially flat crate floor; integral marginal flanges on said crate floor, said flanges comprising upwardly projecting portions that extend above the plane of said crate floor, rolled tubular portions at the upper extremities of said flanges; and downwardly projecting outwardly flared portions extending downwardly from said rolled tubular portions to a location below the plane of said floor; a reinforcing member in said rolled tubular portions extending around said crate; two folding side members and two folding end members having upright bars pivotally connected with said reinforcing wire; and a top member having two opposite edge portions thereof slidably connected with the upright bars of said two folding side members.

3. A collapsible metal crate comprising a substantially flat crate floor; marginal flanges on said crate floor, said flanges comprising upwardly projecting portions that extend above the plane of said crate floor, rolled tubular portions at the upper extremities of said flanges, and downwardly projecting outwardly flared portions that extend below the plane of said crate floor and are adapted to support said crate floor clear of the surface on which they rest; a reinforcing wire in said rolled tubular portions; upright slots in said flanges and said rolled tubular portion; and side and end portions for said crate, said side and end portions having upright bars provided with eye members positioned in said notches and extending around said reinforcing wire.

4. A collapsible metal crate comprising a substantially flat crate floor; marginal flanges on said crate floor, said flanges comprising upwardly extending portions that extend above the plane of said crate floor, rolled tubular portions at the upper extremities of said flanges; and downwardly projecting outwardly flared portions that extend below the plane of said crate floor; a reinforcing wire in said rolled tubular portions; another reinforcing wire extending around the bottom extremity of said downwardly projecting portions; upright slots forming notches extending through said rolled tubular portion and down into said flanges; and side and end portions for said crate, said side and end portions having upright bars provided with eye members positioned in said notches and extending around the reinforcing wire that is disposed in said rolled tubular portion.

5. In a folding metal crate, a substantially flat crate floor; a reinforcing member carried by the marginal portions of said floor; two oppositely positioned side members for said crate each side member comprising a plurality of bars that are substantially upright when the crate is set up; eye members pivotally connecting the lower end portions of said bars with said reinforcing member along two opposite sides of said crate floor; outwardly offset portions in said bar members adjacent said eye members; and a top member having two opposite edge portions thereof provided with eye members slidably mounted on said bars of said side members, said offset portions of said bar members receiving the eye members of said top member and providing for compact folding of said side members on said top member.

6. A collapsible metal crate comprising a rectangular crate floor; crate sides and ends pivotally connected with the marginal portion of said crate floor; a crate top slidably connected with the crate sides and adapted to rest on the tops of the crate ends when the crate is set up for use; flat spring members carried by said crate top and extending along the lateral edge portions of said top; and holding clips of inverted U shape on the ends of said spring members adjacent the four corners of the crate adapted to fit over the top portions of the crate ends and secure said crate ends and top together.

7. The apparatus as claimed in claim 6 in which a folding partition is pivotally connected with the crate floor and extends cross-wise of the crate and in which latch members of inverted U shape are provided in said spring members to fit over the top edge of said partition and secure the same in raised position.

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