April 25, 1933. P. H. BLOMBERG 1,905,137

COLLAPSIBLE SHIPPING CRATE

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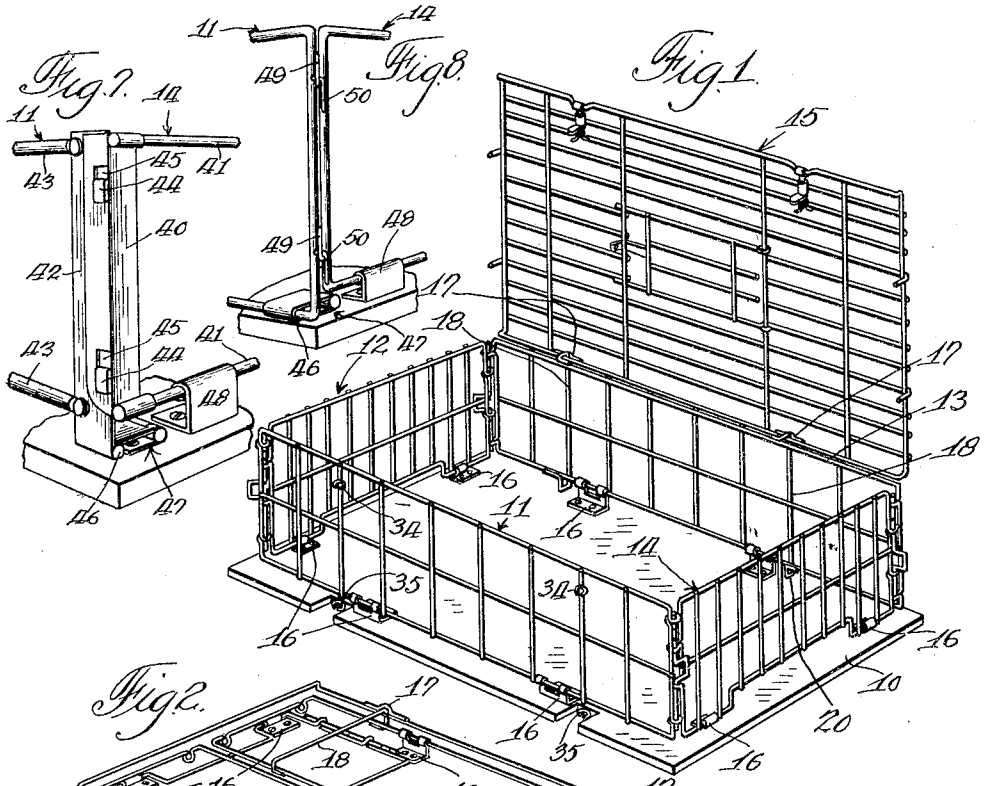

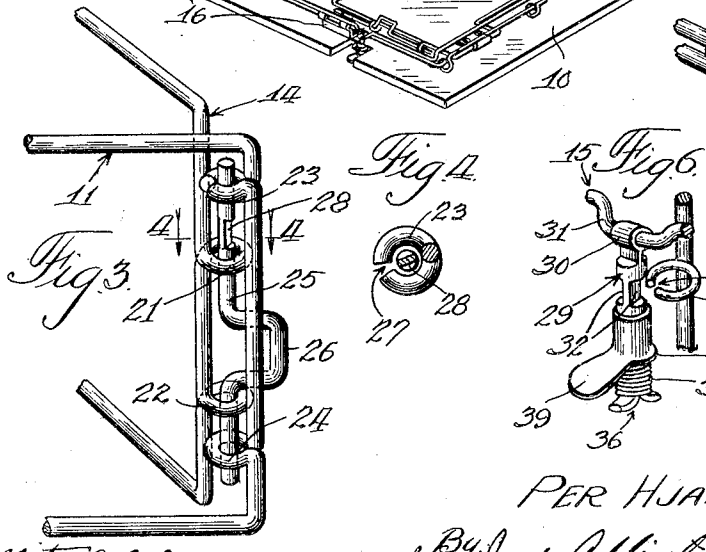

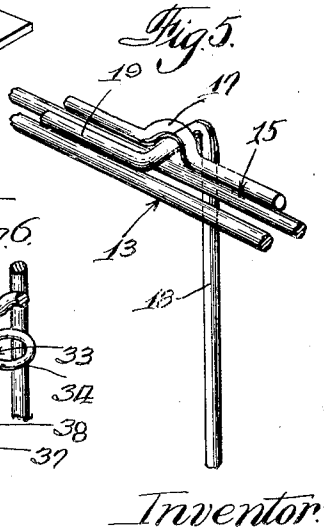

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UNITED STATES PATENT OFFICE

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COLLAPSIBLE SHIPPING CRATE

Application filed January 29, 1930. Serial No. 424,311.

This invention relates to a collapsible shipping crate and has special reference to a crate in which poultry or any other commodity, including merchandise and the like, may be shipped, the crate being collapsible to occupy a minimum of space when in an empty condition.

More particularly, this invention has reference to a collapsible crate comprising a wood or metal base having inwardly folding side wall members hingedly secured thereto which together with a top member forms an inclosure when in an extended condition. The side wall and top members are preferably wire frames, when employed in shipping poultry, the top frame being slidable on one side wall in a manner such that when the latter walls are folded inwardly on the base, the top frame need not extend beyond the confines of the walls.

It is to be noted that the freight rate on empty crates is the same as on full crates for the reason that the same space is ordinarily employed for one as for the other. The present invention contemplates the provision of a device which may be collapsed so that six or more empty crates may readily occupy the space which one full crate takes. It will be further noted that all of the elements entering into the construction are permanently organized so that when in a collapsed or extended condition there are no loose parts which may become misplaced.

One of the most important contributing factors determining its utility is the durability thereof which must be very pronounced because of the great amount of misuse which such a device almost always occasions in handling by hurried freight attendants. The construction, particularly the locking means for connecting the side walls in an extended condition, is such that it may withstand many times its own weight.

Other important features of the construction are the simplicity of the construction and ease with which the operating elements may be manipulated. A sliding movement of a rod disposed at each corner or a similar movement of one pair of frame members is all that is required to unlock the interconnecting elements whereafter the wall members are pivoted inwardly against the base. This construction is also comparatively inexpensive to manufacture and comparatively light in weight.

Other objects and advantages will hereinafter the more fully described and for a more complete understanding of the characteristic features of this invention, reference may now be had to the following description when taken together with the accompanying drawing, in which latter:

Figure 1 is a perspective view of the device of this invention showing the top thereof in a raised position;

Fig. 2 is a view similar to Figure 1, showing the side walls thereof in a collapsed condition;

Fig. 3 is a perspective view of one corner of the device showing more particularly the interconnecting means for the side walls;

Fig. 4 is a plan sectional view taken on the line 4—4 of Fig. 3;

Fig. 5 is a perspective view of a fragmentary portion of the slidable connection between the top and one side wall of the device;

Fig. 6 is a perspective view of the locking mechanism for securing the top to the side walls when in an extended position and for securing all of the elements in position when in a collapsed condition;

Fig. 7 is a perspective view of a corner of a modified form of interconnecting means for the side walls; and

Fig. 8 is a perspective view of a corner of still another form of interconnecting means for the side walls.

Referring now more particularly to the drawing, the device of this invention is illustrated as comprising a base 10 having side wall members 11, 12, 13 and 14 pivotally mounted thereon and a top member 15 slidably connected to the side wall member 13.

The side wall members 11, 12, 13 and 14, when employed as poultry shipping crates, preferably comprise wire frames having a wire mesh of any desired type fastened thereto in any usual manner, the particular type depending upon the character of the

poultry or live stock shipped. Of course, if merchandise and dry goods are shipped, the side wall members may be made solid either of wood or metal. The bottom portion of the wire frame of each of the walls is suitably held in hinges 16, which latter are secured to the base 10 in any desired manner. The base 10 may be made of metal or of wood as desired, the thickness of the stock depending, of course, upon the usual conditions, namely, the height, width and length of the enclosure and the character of the commodity shipped therein. The side walls pivot inwardly toward each other, the end members 12 and 14 being lowered first whereafter the members 11 and 13 are pivoted thereover. In order that the members 11 and 13 may rest on top of the members 12 and 14, the hinge members 16 for the former pair, are raised the thickness of the side wall members 12 and 14, as shown particularly in Figure 1 of the drawing.

The top 15 likewise preferably comprises a wire outer frame when employed as a poultry crate covered with a suitable wire mesh, in the instance of the drawing the particular mesh comprising laterally and longitudinally extending cross wires welded to the outer frame work as is also shown with reference to the side walls.

A pair of looped members 17 are fixedly secured to the wire frame on one side thereof providing openings therebetween to receive a pair of guide members 18 in the form of wire rods. Referring more particularly to Fig. 5 it will be noted that the guide member or rod 18 has an end portion 19 fixedly secured to the wire frame of the side walls 13. The rod 18 is offset relatively to the plane of the side wall 13 in order to obviate the necessity of offsetting the wire frame of the top 15.

In order to lie within the confines of the side wall members when the device is in a collapsed condition, the top 15 must be slidably mounted in addition to being pivotally mounted to open when in an extended condition. It is apparent that the looped member 17 will provide a pivotal movement for the top and will also permit the entire top to be moved backwardly along the guide members 18, the entire width of the side wall member, the rod 18 having a second offset portion 20 whereby the rod 18 is substantially longer than the width of the side wall 13. Therefore, when the side wall members are pivoted inwardly toward each other the top member 15 is moved rearwardly on the guide members 18 in order that it occupies substantially the same position relatively to the base 10 as when it is in an extended position. This collapsed condition of the device is shown more particularly in Fig. 2.

Referring now more particularly to Fig. 3 of the drawing, the interconnecting means for the side walls is shown. It is apparent that several different forms may be shown but for purposes of illustration, the particular embodiments illustrated in the drawing are preferable, the form shown in Figs. 1 to 5 being desirable when employed with a wire frame. However, should an angle iron frame be employed the angle irons may be provided with recessed portions in the manner as will hereinafter be apparent with reference to Figs. 7 and 8. The wire frames 11 and 14 are provided with a pair of cooperating looped portions 21, 22, 23 and 24 on each edge of the adjacent side walls, one pair of looped portions 21 and 22 on the wire frame 14 being disposed between the other pair of looped portions 23 and 24, which latter are disposed on the wire frame 11. These looped portions are preferably formed integrally with the wire frame members, although it is apparent that separate rings or eyelets may be welded, or otherwise secured directly to a wire frame member, or any other type of frame member. Similarly, it is readily apparent that should the frame members be made of angle iron, recesses may be provided therein having the same functions that are taught by the present application.

The eyelets 21, 22, 23 and 24 are preferably axially lined when in a vertical position in order to receive therein a rod member 25, which latter is slidably journalled in and carried by the intermediate eyelets 21 and 22. The rod 25 is offset as at 26 to provide a seat for abutting the eyelet 22 to prevent a further downward movement thereof. The upper part of the offset portion of the rod 25 prevents a movement in the opposite direction beyond a certain point which will hereinafter be more fully discussed. The offset, therefore, prevents the displacement from the frame in which it is carried.

The eyelet 23 is provided with a cut-away portion 27 communicating with the opening in the eyelet. The diameter of the rod 25 is reduced as at 28 to permit the reduced portion to pass through the opening 27. However, when the rod 26 is in its lowered position as shown in Fig. 3, the rod engages all of the eyelets and thereby connects the adjacent frame members. When the rod 25 is moved upwardly to a second position the reduced portion 28 may be brought into alignment with the opening 27 and the lower end of the rod disengages entirely the eyelet 24 whereafter the frame or side wall 11 may be pivoted inwardly on the base. The frame 14 is, therefore, also disconnected and may similarly be moved to its pivoted position on the base. These interconnecting means are disposed on each of the four corners of the device and operate in the same manner as outlined above with reference to that means shown in Fig. 3.

Referring now more particularly to Fig. 6 of the drawing, the device therein illustrated is a locking mechanism comprising a pin 29 pivotally mounted as at 30 to an offset portion in the wire frame of the top 15. The pin has a reduced area 32 at the end near the pivotal point for passing through a cut-away portion 33 in a ring member 34, the ring member being suitably secured to the side wall 11 as by means of welding the same to one of the cross wires forming the wire mesh. A second ring 35, corresponding to the ring 34, is disposed in cut-away portions of the base whereby the pin 29 engages the same when in a collapsed condition as in Fig. 2. The free end of the pin 29 is bifurcated and spread as at 36 to act as a stop for the spring 37 limiting its movement in an outward direction, the spring engaging a sleeve 38 having an operating handle 39 extending outwardly therefrom.

The sleeve 38 is slidable along the pin 29 and is held preferably in a position adjacent the pivotal end of the pin 29 by reason of the coil spring 37. When it is desired to engage the pin 29 in either of the rings 34 or 35 to lock the cover in either its extended or collapsed conditions, the operating handle 39 is moved outwardly toward the free end of the pin 29 against the tension of the spring 37 so that the reduced portions 32 of the pin 29 may pass through the opening 33 of the ring 34.

When the pin 29 is axially aligned with respect to the ring 34 the sleeve 38 is permitted to cover the reduced portions 32 by extending into the opening in the ring 34. Likewise when it is desired to release the pin 29 from the ring 34, the sleeve 38 is withdrawn from the ring 34 thus exposing the reduced portions 32 and permitting the same to pass out the opening 33 when pivoted at the point 30.

Referring now more particularly to Fig. 7 of the drawing, the side wall member 14 thereof is shown as formed of a pair of angle iron end uprights 40 connected together by horizontally extending wire members 41, although it is to be understood that the angle iron 40 may be extended in one piece to form the entire frame to receive a wire mesh or sheet. The side wall member is preferably formed of an upright bar 42 at each end interconnected by wires 43 to form a frame for receiving a wire mesh or sheet. It is also to be understood that the upright 42 may be extended around to form an integral frame similiar in effect to the frame 14 in its modified form.

The upright 42 is provided with a pair of hook-like members 44 which are preferably serrated and deformed from the material of the upright to fit in the slots 45 formed in the angle iron member 40 and hook over the material bounding one side of the slot to secure the upright 42 to the member 40. The hooking action is accomplished by means of pivoting the frame member 11 on the free end 46 of a pair of hinge members 47 (only one hinge being shown). Thus a double pivot provides a substantially vertical movement of the bar 42 relatively to the angle iron 40.

The member 14 is pivotally mounted in a bearing 48 which, like the hinge 47, is secured to the base of the crate. Both members 11 and 14 pivot inwardly as in the previously described embodiment.

The embodiment illustrated in Fig. 8 is similar in most respects to Fig. 7 in that one side wall member 11 is pivotally mounted at 46 to the free end of a hinge 47 to provide for a substantially vertical movement with respect to the other side wall member 14. In so doing, a pair of hook members 49 on the member 14 are permitted to disengage a second pair of hook members 50 on the member 11. In perhaps the least expensive form of construction, the frame of the members 11 and 14 may be of wood and the hook members may be common nails which are bent over after being driven through the wood to form hooks. However, the form illustrated contemplates the use of wire frames with pins welded or otherwise secured thereto to be bent into the shape desired.

While several forms of this invention are herein shown and described, it is to be understood that other embodiments may be apparent to those skilled in the art without departing from the spirit and scope of this invention, and, therefore, the same is to be limited only by the scope of the prior art and the appended claims.

I claim:

1. In a device of the character described, a base, side wall members mounted to pivot inwardly toward each other on said base, a top for engaging said side wall members in an extended condition, and guiding means extending across the width of one of said side wall members, said top slidably engaging said guiding means and detachably engaging the other of said side walls whereby said top need not extend beyond the confines of said side walls when said device is in a collapsed condition.

2. In a device of the character described, a base, side wall members mounted to pivot inwardly toward each other on said base, a top for engaging said side wall members in an extended condition, and a pair of guide members secured to and extending across the width of one of said side wall members, said top having means for slidably engaging said guide members and detachably engaging the other of said side walls whereby said top need not extend beyond the confines of said side walls when said device is in a collapsed condition.

3. In a device of the character described, a

base, side wall members mounted to pivot inwardly toward each other on said base, a top for engaging said side wall members in an extended condition, a rod secured to and extending across the width of one of said side wall members, and a looped member on said top for slidably engaging said rod, said top detachably engaging the other of said side wall members whereby said top need not extend beyond the confines of said side walls when said device is in a collapsed condition.

4. In a device of the character described, a base, side wall members comprising a wire frame mounted to pivot inwardly toward each other on said base, and a wire frame top member for covering said side wall members when in an extended condition, a pair of rod members connected between opposite side wires of one of said side wall members and spaced apart from the plane of the wall, and a pair of looped portions on one side of said top member for receiving said rod members whereby said top need not extend beyond the confines of said side walls when said device is in a collapsed condition.

5. In a device of the character described, a base, side walls including a wire frame pivotally mounted on said base, a top member for said side wall members, said wire frames having a pair of cooperating looped portions on each of the adjacent edges thereof, and an element held against displacement between one of said pair of looped portions and extending through all of said looped portions for detachably connecting said members.

6. In a device of the character described, a base, side walls including a wire frame pivotally mounted on said base, a top member for said side wall members, said wire frames having a pair of cooperating looped portions formed integrally therewith on each of the adjacent edges thereof, and an element held against displacement between one of said pairs of looped portions and extending through all of said looped portions for detachably connecting said members.

7. In a device of the character described, a base, side walls pivotally mounted on said base, a top member for said side wall members, and interconnecting means on adjacent edges of said side walls, said means comprising cooperating eyelets on adjacent edges of said wall members, and a rod extending through said eyelets for connecting said wall members, said rod having a reduced portion of a diameter to permit its passage through a notch in one of said eyelets to collapse said side wall members.

8. In a device of the character described, a base, side walls pivotally mounted on said base, a top member for said walls, and interconnecting means on adjacent edges of said side walls, said means comprising a pair of cooperating recessed members at each of said edges, a locking element slidably journalled in and carried by one of said members and extending through the other of said members when in one position for connecting said side walls, said element being slidable out of engagement with said latter recessed member to collapse said side walls.

9. In a device of the character described, a base, side walls pivotally mounted on said base, a top member for said walls, and interconnecting means on adjacent edges of said side walls, said means comprising a pair of cooperating recessed members at each of said edges, a rod slidably journalled in and carried by one of said recessed members and extending through the other of said members when in one position for connecting said side walls, said rod having an offset portion to guard against displacement thereof and a reduced portion of a diameter to permit its passage through an opening communicating with said recess in one of the other of said recessed members when it is desired to collapse said side walls.

10. In a device of the character described, a base, side walls pivotally mounted on said base, a top member for said walls, and interconnecting means on adjacent edges of said side walls, said means comprising a pair of cooperating looped portions on each edge of the adjacent side walls, one pair of looped portions being disposed between the other of said looped portions, a rod slidably journalled in and carried by the intermediate pair of looped portions and extending through the other pair of looped portions when in one position for connecting said side walls, said rod having a reduced portion of a diameter to permit its passage through an opening in one of the outer looped portions when it is desired to collapse said side walls.

11. In a device of the character described, a locking member comprising a pivotally mounted pin having a portion thereon of a reduced diameter, a ring member for receiving said pin, said ring having a cut-away portion communicating with the axial opening thereof for permitting said reduced portion to pass therethrough, a sleeve slidable over said pin member to fit in said ring member, and a spring normally urging said sleeve in a position in said ring enclosing said reduced portion to prevent disengagement of said pin and ring members.

12. In a device of the character described, a base, side walls pivotally mounted on said base, cooperating side walls pivotally mounted on pivotally mounted members of said base, and fixed means on each of said side walls cooperating to connect detachably said side walls in a fixed relation.

13. In a device of the character described, a base, side walls pivotally mounted on said base, cooperating side walls pivotally mounted on pivotally mounted members of said

base, some of said side walls having slotted portions for receiving fixed projections on the other of said side walls to connect detachably all of said side walls in a fixed relation.

In witness whereof, I have hereunto subscribed my name.

PER HJALMER BLOMBERG.