Oct. 31, 1933. G. W. ESCHENBACH 1,932,773

MULTIFORM KNOCKDOWN BOX

Filed Oct. 17, 1931 4 Sheets-Sheet 1

Fig. 1.

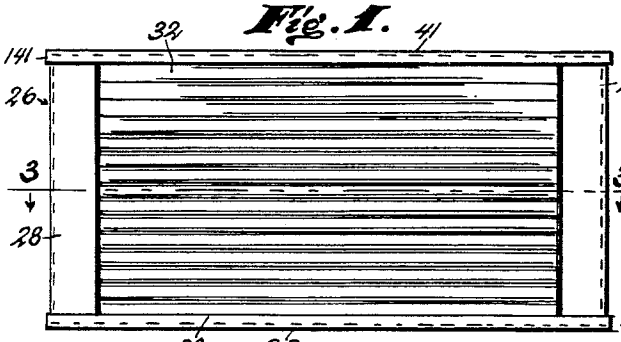


Fig. 2.

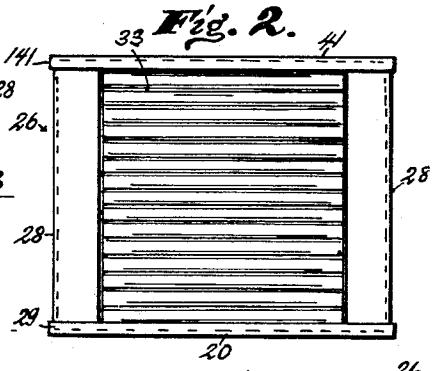
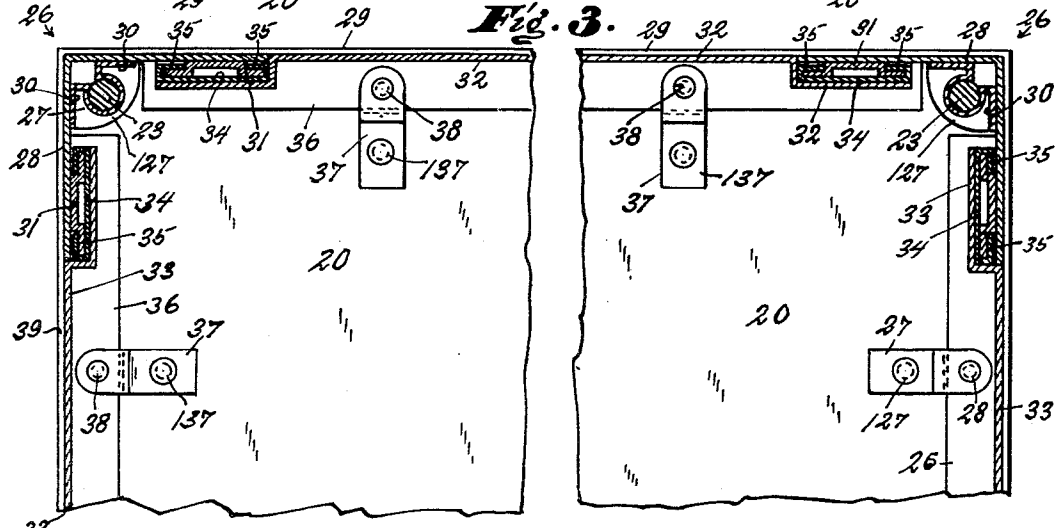


Fig. 3.



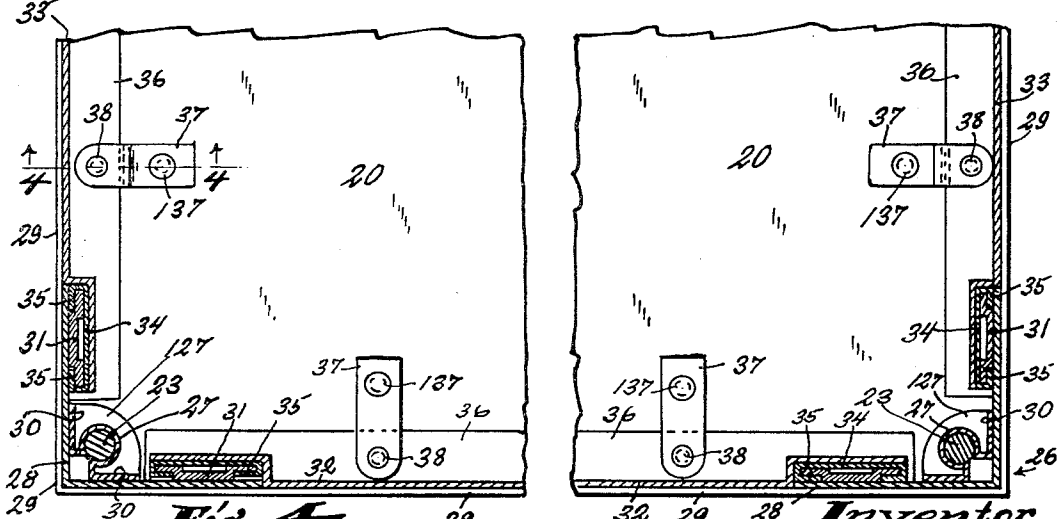
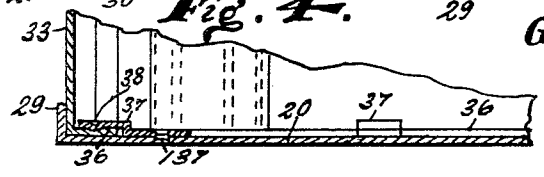


Fig. 4.



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Filed Oct. 17, 1931 4 Sheets-Sheet 2

Fig. 5.

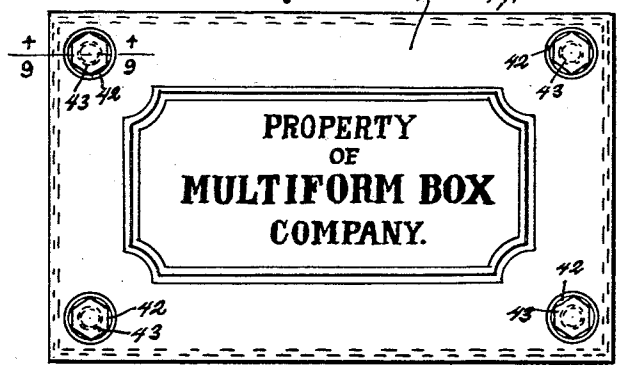


Fig. 6.

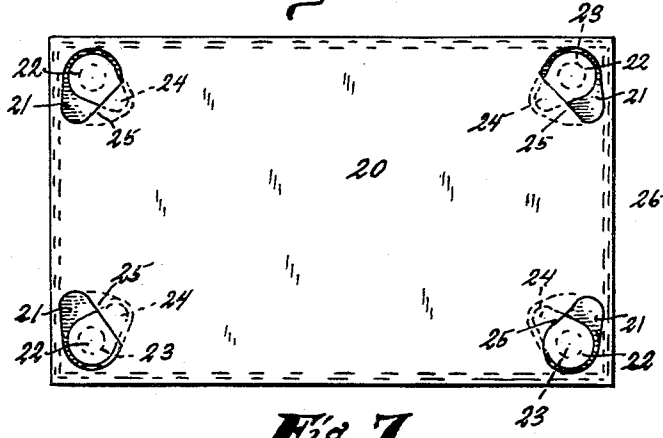


Fig. 7.

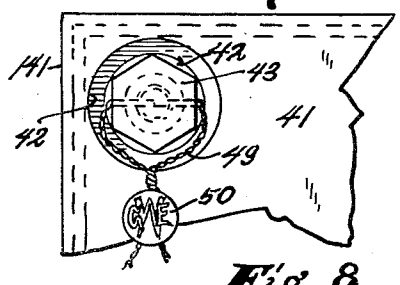


Fig. 8.

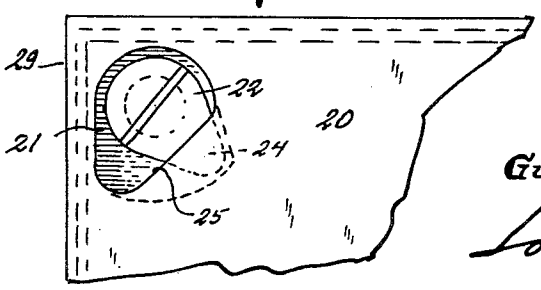
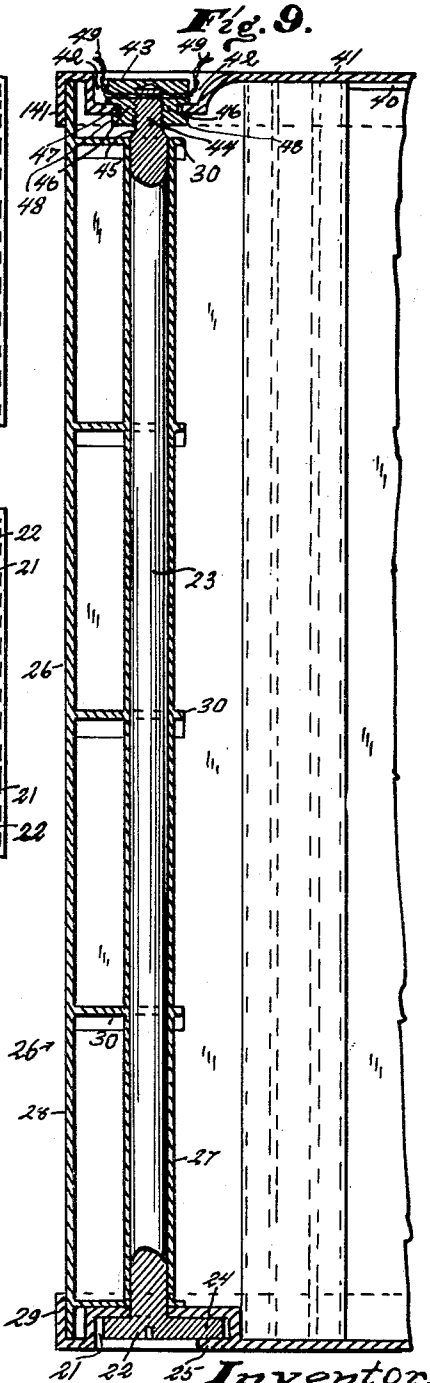


Fig. 9.



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MULTIFORM KNOCKDOWN BOX

Filed Oct. 17, 1931 4 Sheets-Sheet 3

Fig. 10.

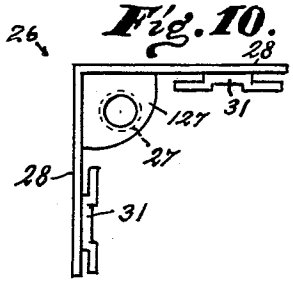


Fig. 13.



Fig. 14.

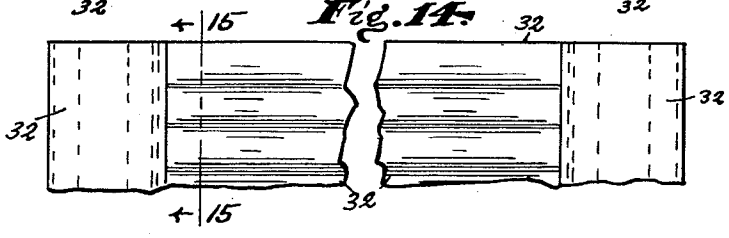


Fig. 11.

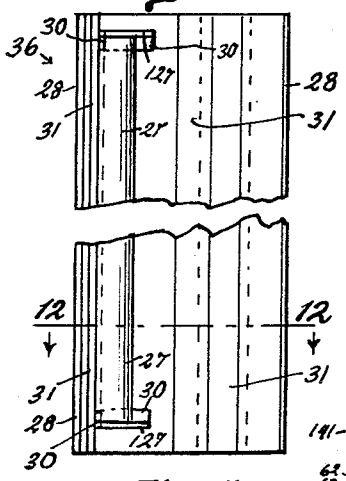


Fig. 15.

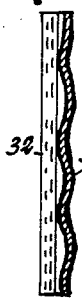


Fig. 16.

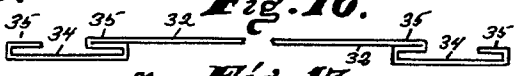


Fig. 17.

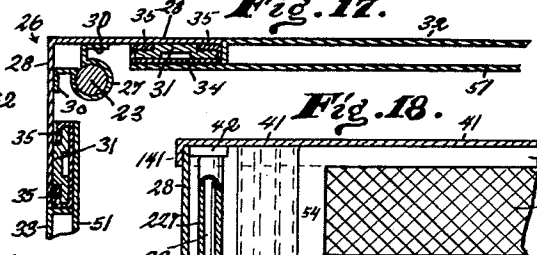


Fig. 18.

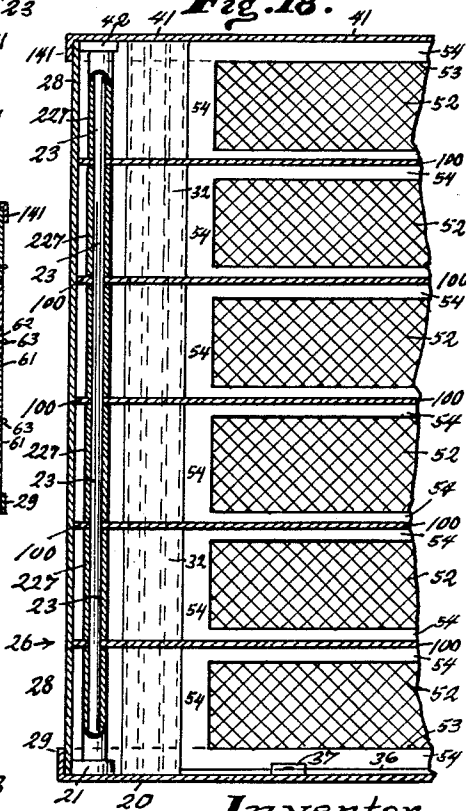


Fig. 19.

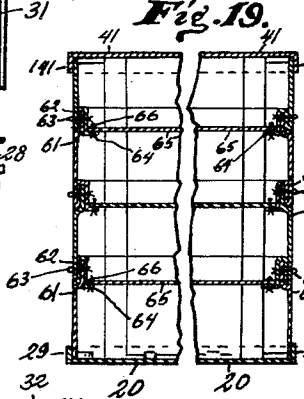


Fig. 12.

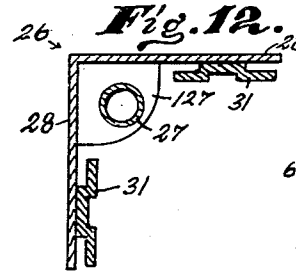


Fig. 21.

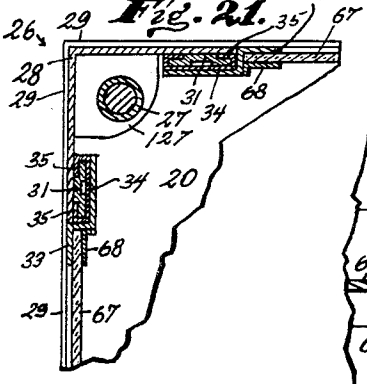
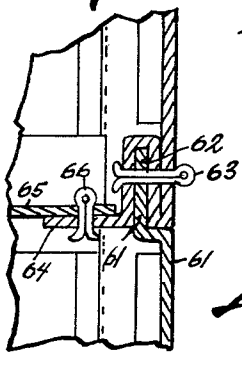


Fig. 20.



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MULTIFORM KNOCKDOWN BOX

Filed Oct. 17, 1931 4 Sheets-Sheet 4

Fig. 22.

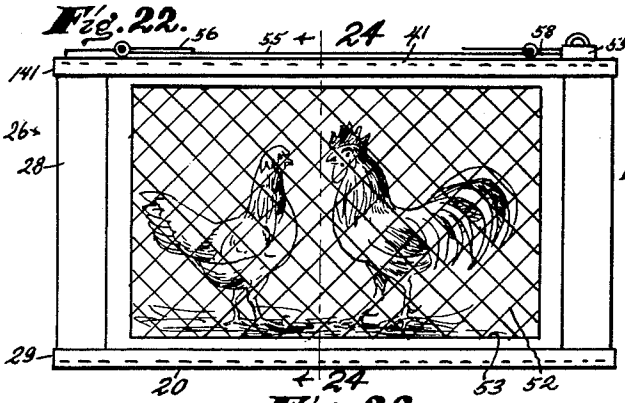


Fig. 24.

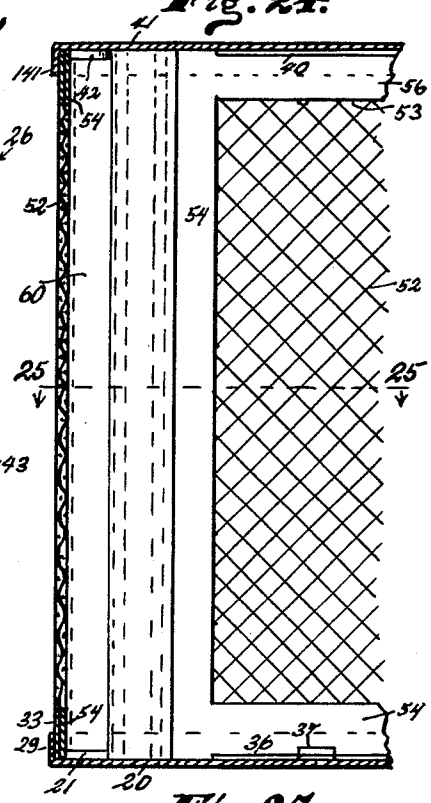


Fig. 23.

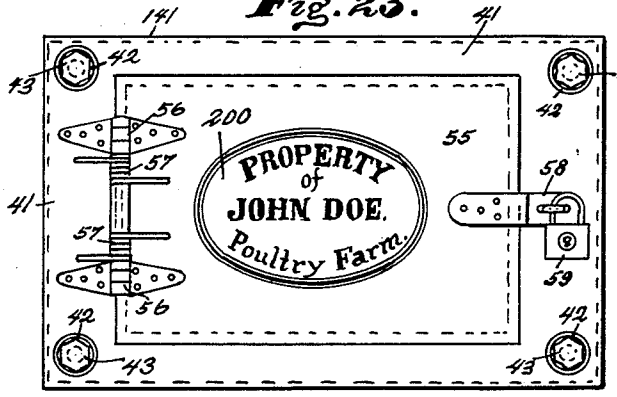


Fig. 26.

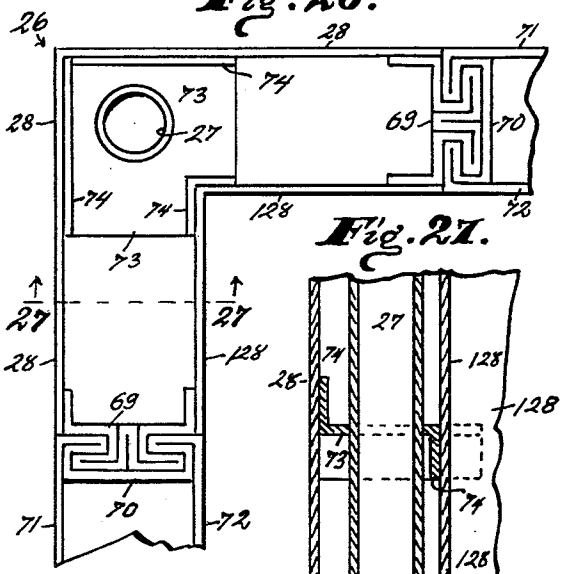
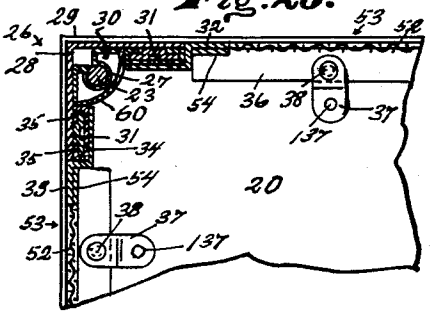


Fig. 27.

Fig. 25.



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Patented Oct. 31, 1933 1,932,773

UNITED STATES PATENT OFFICE

1,932,773

MULTIFORM KNOCKDOWN BOX

Gustavus W. Eschenbach, Los Angeles, Calif.

Application October 17, 1931. Serial No. 569,443

8 Claims. (Cl. 220—4)

This invention relates to the provision of a multiform knockdown box that can be made available for relatively universal use with the principal object of economy in use of boxes for storage, packing, display and shipment of commercial goods, and to that end I provide a knockdown box that can be used repeatedly for all of the foregoing purposes. That is, the life of the box is not limited to one shipment of goods, but can be used repeatedly, as it is constructed so it can be knocked down after being used for shipment and packed into a relatively small space so that it can be economically returned to the shipper to be used over again.

Heretofore it has not been possible to economically return shipping boxes to the shipper after they have been used, owing to their great bulk, and also the destructive mutilating manner of opening such boxes to remove their contents when received, for, as is well known, a major portion of such boxes is made of wood with the cover secured in place by nails, which containers have usually been destroyed after their contents have been removed, and the annual loss by such destruction of shipping boxes is estimated in millions of dollars that the consumer must pay.

One of the principal objects of this invention, therefore, is to provide shipping boxes that can be used repeatedly, economically and for a long period of time and save a great annual cost to the consumer; which object is accomplished by providing a knockdown box that can be economically returned to the shipper owing to the fact that when knocked down the parts can be assembled into such a small space that the return shipping charges will be relatively small.

Another object is to provide a multiform knockdown box that almost any person can easily and quickly erect from the knockdown parts to form a box of any desired size or strength for the various purposes for which boxes are to be used. To that end I provide a knockdown box with parts constructed so they can be assembled in a uniform manner regardless as to the size or purpose for which the box is to be used. That is a very small box has its parts constructed exactly like a large one, so that both are assembled and knocked down in the same way, and also boxes for crating, display and ventilating are assembled and knocked down in the same way as the tightly sealed boxes.

Another object of the invention is to provide a knockdown metal box which in addition to being relatively strong, light and durable and suitable for repeated use for shipping all kinds of commercial goods, is also especially adapted for use in either displaying small pets, live-stock and the like for sale or exposition porposes or for shipping the livestock in a clean, sanitary manner.

To that end I provide an all metal knockdown box that is relatively free of cracks and crevices into which mites can propagate and also in which unsanitary material might accumulate to be offensively odorous.

As is well known, the objectionable features of pet live-stock exhibitions as now given are the offensive odors incident to uncleanliness and also the liability of spreading contagious diseases by use of coops that cannot be kept spotlessly clean and free of disease and odor; and an object of this invention is to provide a coop for dogs, cats, rabbits, and all kinds of poultry, that is relatively easy to be knocked down when necessary so it can be cleaned and sterilized in a purifying solution to thereby eliminate objectionable features heretofore mentioned.

Another object of the invention is to provide a coop for the exhibition of pet live-stock that can be securely assembled, sealed and locked so that the live stock therein cannot be easily handled or removed without the consent of an authorized person; and also the lid can be embossed with the name of the owner, so that there will be no confusion of ownership either when the coop is used for exhibition or shipping purposes.

A feature of invention is shown in the means for securing the parts of the knockdown box together so that none of the fastening means can be easily misplaced or lost when the box is knocked down, as the locking parts, except the detachable tie rods, are permanently secured to the bottom and lid of the box, and also the heads of the corner tie rods and their lock nuts are set relatively deep in recesses so they do not extend above the bottom or top of the box to interfere with the handling and close packing of the boxes when in use.

Another feature of invention is shown in constructing the knockdown parts so the sides and ends can be built up in sections as desired for the purpose of forming numerous compartments in the box by placing therein either vertical or horizontal partitions and securing them in place.

Another feature of invention is shown in the construction of the built-up corner post whereby a box is provided that in view of its lightness is exceedingly strong and durable and able to resist great pressure or be handled roughly without being crushed or greatly damaged.

Other objects, advantages and features of in-

vention may appear from the accompanying drawings, the subjoined detailed description and the appended claims.

The accompanying drawings illustrate the invention, in which:

Fig. 1 is a side view of a multiform knockdown box constructed in accordance with this invention, showing the sides formed of corrugated sheet iron.

Fig. 2 is an end view of the box.

Fig. 3 is an enlarged fragmental sectional view on line 3—3, Fig. 1, showing the sides and ends formed of flat sheet iron and detachably connected to the built-up corner posts; and also showing the buttons that are permanently secured to the bottom of the box turned to lock the bottom flange of the ends and side walls to the bottom of the box.

Fig. 4 is a fragmental section on line 4—4, Fig. 3, showing the detailed construction of one of the locking buttons in position to hold one of the end walls secured to the bottom of the box.

Fig. 5 is a plan view of the box shown in Fig. 1, showing lock nuts in the top corners of the box.

Fig. 6 is a bottom view of the box showing the flanged ends of the tie rods turned into a retaining position under flanges over the recessed seats for the tie rod heads, so they are supported above the bottom surface of the box and do not protrude to interfere with the handling or close packing of the boxes.

Fig. 7 is an enlarged fragmental view of the upper left hand corner portion of the box shown in Fig. 5 showing a seal tag secured to a lock nut.

Fig. 8 is an enlarged fragmental view of the upper left hand corner portion of the box shown in Fig. 6, more clearly illustrating the means for supporting the tie rods when in use.

Fig. 9 is an enlarged fragmental section on line 9—9, Fig. 5, showing a detailed construction of one of the tie rods and also showing one of the lock nuts swivelly secured to the box lid, showing the head of the tie rod and also the lock nut arranged in deep seated recesses so they do not protrude above or below the top or bottom surfaces of the box.

Fig. 10 is an end view of the built-up corner posts detached from the box.

Fig. 11 is a fragmental inside view of the post shown in Fig. 10.

Fig. 12 is a cross section on line 12—12, Fig. 11.

Fig. 13 is a fragmental top edge view of a side wall with the body portion formed of corrugated sheet iron; and showing the preferred way of forming the end members of the telescoping attaching means.

Fig. 14 is a fragmental side view of the wall shown in Fig. 13.

Fig. 15 is a fragmental section on line 15—15 of Fig. 14.

Fig. 16 is an edge view of a side wall formed of flat sheet metal with the telescoping members integral with the wall ends.

Fig. 17 is a fragmental section through a knockdown box showing reinforced walls secured to an end post.

Fig. 18 is a fragmental vertical section through a left hand portion of a knockdown box, a side wall provided with screen covered openings and also showing horizontal partitions supported on the tie rods to separate the interior into compartments suitable for housing pet live-stock for display or shipping.

Fig. 19 is a semi-diagrammatic fragmental sectional view through a knockdown box showing a modified way of forming the walls and arranging the partitions therein.

Fig. 20 is an enlarged view of a portion of the right hand wall shown in Fig. 19 showing the means for detachably securing the sections of the side walls together and also showing the detachable means for securing the partitions to flanges of the side walls.

Fig. 21 is a sectional view through a corner portion of a knockdown box showing the walls provided with glass panels so the contents of the box when in use are visible.

Fig. 22 is a side view of my knockdown box utilized as a display coop for pet live-stock.

Fig. 23 is a plan view of the box shown in Fig. 22, showing the detailed arrangement of the top trap door and locking means.

Fig. 24 is a fragmental cross section on line 24—24 of Fig. 22 showing the means for securing the wire panels in the side and end walls of the box.

Fig. 25 is a cross section on the line 25—25 of Fig. 24 showing a guard in the remote corners of the box to prevent the accumulation of foreign substances therein.

Fig. 26 is a fragmental cross section through a box designed for heavy duty.

Fig. 27 is a fragmental section on line 27—27 of Fig. 26 showing one of the cross plates for reinforcing the corners of the box.

In detail my multiform knockdown box includes a bottom 20 in the form of a shallow trough having portions adjacent its corners punched upward to form recesses 21 for the heads 22 of the tie rods 23 that are arranged to extend upwardly through the box. The heads 22 have side extensions 24 that are adapted to be turned under the flanges 25 to hold the rods 23 from displacement while the box is being assembled. The flanges 25 extend out a sufficient distance over the recesses to so engage the extensions 24 when the heads are seated in the recesses as best illustrated by full and dotted lines in Figs. 6, 8 and 9.

When the rods are so secured in the bottom 20 the built-up corner posts 26 are arranged in position above the top ends of the rods 23 and are then lowered to telescope into the tubular guides 27 down over their respective rods; and when so placed the bottom outer edge portion of the angle irons 28 fits snugly against the inside surface of the upturned flange 29 of the bottom 20.

The built-up corner posts 26 include the angle means 28 to which the flanges 30 of the tubular guides 27 are secured as by brazing and these guides are additionally secured in place by the brace plates 127 that extend around the guides and are secured by brazing to the angle irons 28.

Also secured by brazing to the inside walls of the angle irons are the winged plates 31 that form the fixed members of telescoping means for detachably securing the end and side walls of the box to the corner posts.

The side and end walls 32, 33 of the box when made for heavy duty are preferably formed of corrugated sheet iron with the ribs thereof extending parallel with the bottom of the box, as indicated in Figs. 1, 2 and 13 to 15 inclusive. However, these walls for some purposes can be formed of plain light weight sheet iron as indicated in many of the other figures.

Channel irons 34 having oppositely arranged extensions 35 are secured by brazing to the end portion of the walls 32, 33 in position to be tele-

scoped downwardly over the winged plates 31 to very firmly and removably hold the side and end walls secured to the corner posts.

The walls have bottom flanges 36 that are seated on the bottom 20 when the walls are in place, and they are detachably secured thereto by the buttons 37 that are pivotally secured by rivets 137 to the bottom 20 so they can be turned over the flanges 36 to very rigidly secure the walls and bottom of the box together. Preferably the buttons 37 are provided with detents 38 that extend into recesses 39 in the flanges 36 to thereby prevent accidental displacement of the buttons when in use, as best shown in Fig. 4.

The top edge portions of the walls 32, 33 are preferably provided with inwardly extending flanges 40 on which the box lid 41 is seated when in place. The lid 41 is in the form of a shallow inverted flat bottom trough and when in place its flanges 141 extend downward and snugly engage the outer top edge portion of the walls and corner posts.

The lid 41 has portions adjacent its corners punched inwardly to form recesses 42 for the lock nuts 43 that are arranged to be screwed down and detachably secured to the top threaded ends 44 of the tie rods 23 and preferably tapered portions 45 are arranged between the threaded ends 44 and body of the rods 23 so they can be more easily extended into the guides 27.

The nuts 43 have tubular extensions 46 that after being fitted down through the opening 47 in the bottom of the recesses 42 have their lower ends turned outwardly to form locking flanges 48 that permanently secure the nuts to the box lid so they can be rotated on their axis to secure them to or detach them from the rods 23.

Preferably the nuts 43 and threaded ends of the rods have a hole drilled through them for the sealing wires 49 so that a sealing tag 50 can be secured to the wires, as shown in Figs. 7 and 9, for a purpose well known in the art.

It is obvious that a box so constructed will be relatively light and exceedingly strong and durable and useful for many purposes and also that it can be erected or knocked down speedily and with ease, and that when knocked down there are no small parts such as nuts or locking buttons to be lost, as they are permanently secured to their respective parts.

If desired, the channel irons 34 can be formed integral with the ends of the side and end walls as indicated in Fig. 16, but preferably they are formed of separate parts and secured to the walls, as by brazing or spot welding.

Also if desired the walls of the ends and sides can be reinforced with inner walls 51, as indicated in Figs. 17 and 26.

It is also my intention to utilize my box for forming coops for either shipping or displaying commercial or pet live stock, and when so used I provide the sides and ends with wire panels 52. That is, I cut openings 53 through the sides and ends that I cover with the wire 52, the edge portion of which are secured between the metal border strips 54 that are arranged inside of and brazed to the end and side walls.

When my box is to be used for displaying a large number of poultry for sale or shipping I provide a relatively large box with a number of horizontal partitions 100, as indicated in Fig. 18. These partitions are preferably arranged between the sectional guides 227 and supported on the tie rods 23, as shown.

When my box is to be used for displaying pet stock in exhibitions and the like I preferably construct it as indicated in Figs. 22, 23 and 24. As seen therein I provide the lid of the box with a trap door 55 that is hinged at 56 to the lid and provided with springs 57 that normally hold the door closed, and at the opposite end I provide a hasp 58 and lock 59 so that the door cannot be opened except by the owner or an authorized person; and also I emboss the door as at 200 with the name of the owner so that a mistake as to the rightful owner cannot easily be made.

Except as to the door and open wire panels in the end and side walls the display coop box is constructed substantially as the knock down box heretofore described, so that when used in public exhibitions, as previously described, it can be knocked down, cleansed and sterilized, as often as is necessary to avoid the spread of contagious diseases aand eliminate obnoxious odors.

Preferably this display coop is provided with corner guards 60 that can be inserted between the flanges of the corner posts as indicated in Fig. 25, to prevent the corner posts from becoming fouled.

It is also my intention to form the ends and sides of my knockdown box in sections, as indicated in Figs. 19 and 20. As seen therein the top edge portions 61 of the lower sections extend into recess 62 of the lower edge portions of the upper sections and the jointed portions are detachably secured together by cotter pins 63. Also the lower edge portions of the upper sections are turned inwardly to form ledges 64 on which the partitions 65 are detachably secured by the cotter pins 66.

If desired the sides and ends of my knock down box can be provided with glass panels 67, as indicated in Fig. 21. As seen therein openings are cut through the end and side walls and the glass panels 67 secured over the openings by the border strips 68 that can be secured to the walls in any well known way, as by spot welding after the panels are in place.

As indicated in Figs. 26 and 27, I provide a box for very heavy duty and in this construction I have my built-up corner posts 26 formed of angle irons 28 and 128 that are spaced apart and secured together by the multiple folded plates 69. I form my channel irons 70 transversely but integral with the inner and outer walls 71 and 72 so the parts are very rigidly and strongly secured together; also arranged between the angle irons 28 and 128 are corner spacer plates 73 having flanges 74 brazed to the angle irons and arranged to rigidly support the tubular guides 27 in their proper place.

In practice my multiform knockdown box is constructed and used as heretofore fully described.

I claim as my invention:

1. A knockdown box including a sheet metal bottom in the form of a flat bottom trough having relatively deep recesses adjacent the corners thereof, sheet metal end and side walls detachably secured to said bottom, a sheet metal lid extended over the top edges of said end and side walls with relatively deep recesses adjacent the corners thereof that are aligned with the recesses in said bottom, tie rods having upper threaded ends extended through said box adjacent the corners thereof into the recesses in said lid, flanged heads on the bottom ends of said rods that are detachably secured in the recesses in said bottom, and lock nuts permanently and rotatably secured to said lid that are adapted to be se-

cured on the upper threaded ends of said tie rods to hold said parts together.

2. A knockdown box including a bottom in the form of a shallow flat bottom trough having recesses, tie rods extending up through the corners of said trough, angle iron corner posts having tubular guides adapted to be telescoped down over said tie rods, end and side walls detachably secured to said posts, a lid in the form of a shallow inverted trough fitted down over the top edges of said end and side walls and posts, means permanently secured to said lid for detachably securing it to said rods to hold said parts together.

3. A knockdown box including a bottom in the form of a shallow flat bottom trough, tie rods extending up through the corners of said trough, angle iron corner posts having tubular guides adapted to be telescoped down over said tie rods, end and side walls detachably secured to said posts, a lid in the form of a shallow inverted trough fitted down over the top edges of said end, side walls and corner posts, and lock nuts swivelly secured to said lid that are adapted to be screwed on the threaded ends of said tie rods to hold said parts together.

4. A knockdown box including a sheet metal bottom in the form of a shallow flat bottom trough having corner recesses therein, tie rods extending up through the recesses in said trough and having heads supported in said recesses, angle iron corner posts having tubular guides adapted to be telescoped over said tie rods, sheet metal side and end walls detachably secured to said posts, a sheet metal lid in the form of an inverted shallow flat bottom trough fitted over the top ends of said posts and top edges of said walls and having corner recesses therein, and lock nuts in said recesses that are swivelly secured to said lid that are adapted to be attached to said rods to detachably hold said parts together, said nuts and the heads of said rods supported in said recesses so they do not extend above or below the top and bottom surfaces of said box.

5. A knockdown box including a sheet metal bottom in the form of a shallow flat bottom trough, tie rods extending up through said bottom adjacent the corners thereof, heads to said rods having side extensions, flanges on said bottom over which the side extensions of said heads can be turned to hold said tie rods extended therethrough, sheet metal corner posts having tubular guides adapted to be telescoped over said tie rods, sheet metal side and end walls, telescoping means for securing said walls to said posts, a lid in the form of an inverted shallow flat bottom trough fitted on the top ends of said posts and top edges of said walls, and nuts rotatably secured to said lid for detachably securing it to said rods to hold said parts together.

6. A knockdown box including a sheet metal bottom in the form of a shallow flat bottom trough, having corner recesses therein, tie rods extending up through the recesses of said bottom, heads to said rods having side extensions, flanges on said bottom over which the side extensions of said head can be turned to detachably hold said tie rods extended therethrough, sheet metal angular corner posts having tubular guides adapted to be telescoped over said tie rods, sheet metal side and end walls, telescoping means for securing said walls to said posts, a lid in the form of an inverted shallow flat bottom trough fitted over the top ends of said posts and top edges of said walls having corner recesses therein, and lock nuts seated in said recesses that are rotatably secured to said lid that are adapted to be attached to said tie rods to hold said parts together.

7. A knockdown box including a sheet metal bottom in the form of a shallow flat bottom trough having recesses adjacent the corners thereof, tie rods extending up through the recesses of said bottom, flanges on said bottom that are extended partly over said recesses, heads on said tie rods having side extensions adapted to be turned over the top surface of said flanges to detachably hold said rods extended through said bottom, sheet metal side and end walls supported on said bottom, a sheet metal lid fitted over the top edges of said side and end walls having recesses into which the top threaded ends of said rods are extended, and nuts in said recesses that are rotatably secured to said lid for attachment to said rods to hold said parts together.

8. A knockdown box including a sheet metal bottom, sheet metal side and end walls thereon, flanges integral with the bottom edges of said walls that are extended inwardly and seated on said bottom, buttons for securing said flanges to said bottom, a sheet metal lid fitted on the top edges of said walls, tie rods extending through said bottom adjacent the corners thereof, means connected with said bottom for detachably securing said rods thereto and nuts rotatably secured to said lid that are adapted to be secured to the upper threaded ends of said tie rods to detachably hold said parts together.

GUSTAVUS W. ESCHENBACH.