Aug. 27, 1957 E. T. ELFGREN 2,804,227

WIRE CONTAINER STRUCTURE

Filed Feb. 9, 1956 2 Sheets-Sheet 1

FIG. 1

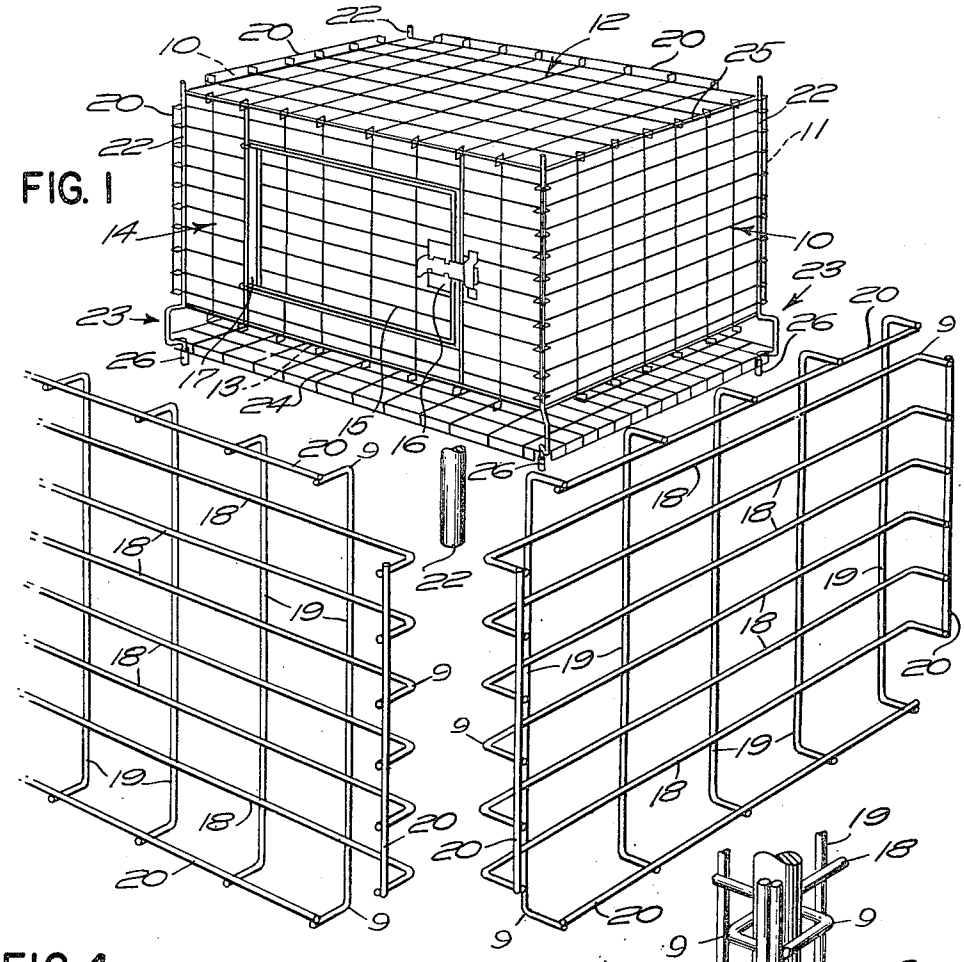


FIG. 4

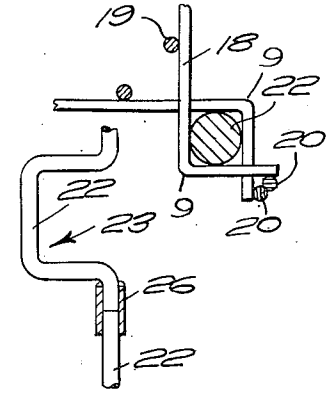


FIG. 6

FIG. 2

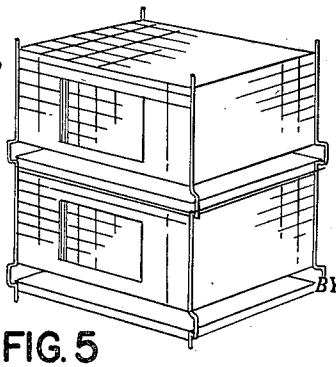


FIG. 5

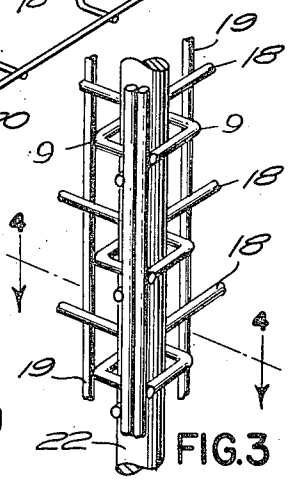


FIG. 3

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WIRE CONTAINER STRUCTURE

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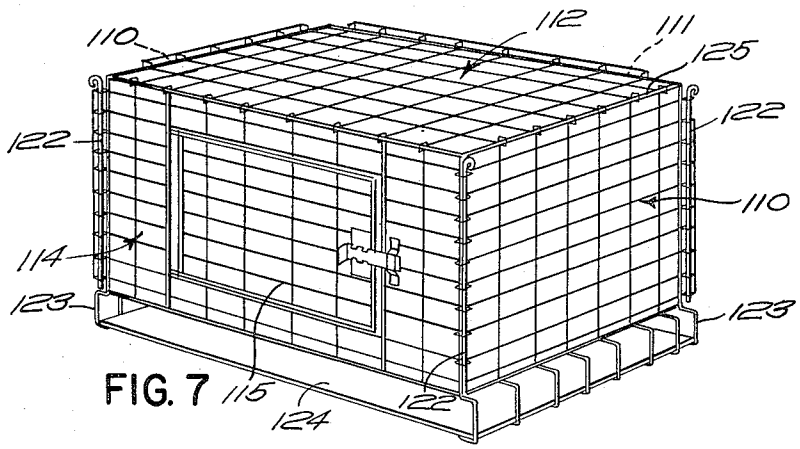


FIG. 7

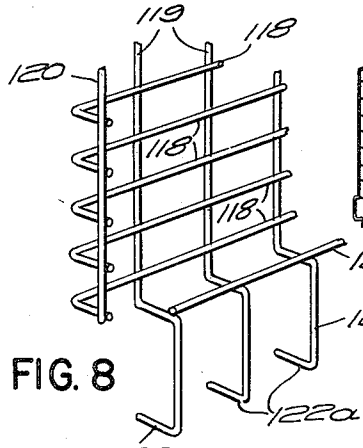


FIG. 8

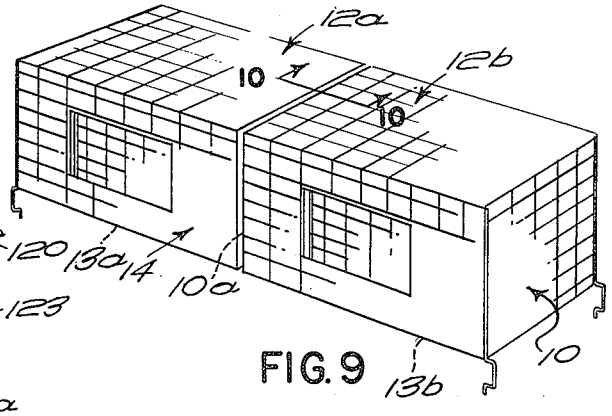


FIG. 9

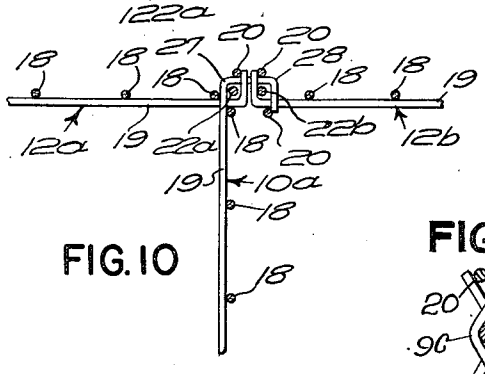


FIG. 10

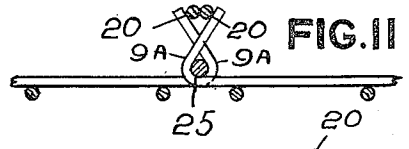


FIG. 11

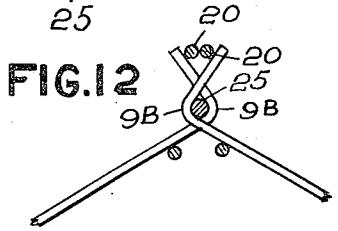


FIG. 12

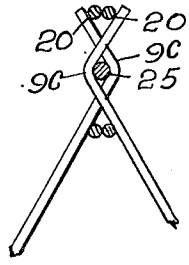


FIG. 13

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WIRE CONTAINER STRUCTURE

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Application February 9, 1956, Serial No. 564,440

14 Claims. (Cl. 220—4)

This invention relates to closures, animal cages, and/or the like, particularly closures the walls of which are made of crossed wires, and is a continuation in part of my application Serial No. 354,988, filed May 14, 1953, now abandoned.

The object of the invention is to provide individual closures which may be shipped in knock-down form and which may be readily assembled without the use of tools.

Another object of the invention is to provide a closure which is entirely made from wire and which has no crevices at the intersection of the sides thereof.

A further object of the invention is to provide a closure in which all the parts are interchangeable and replaceable.

A more specific object of the invention is to provide a wire cage for animals which may be shipped in knock-down form and which may be readily assembled without the use of tools.

A still further object of the invention is to provide a cage which may be readily disassembled to steam clean the parts thereof.

With these and other objects in view, the invention consists of certain novel features of construction as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a perspective view of a wire cage constructed in accordance with my invention,

Figure 2 is a detached perspective view of two walls of the cage and a portion of a corner pin, showing them in position to be assembled;

Figure 3 is a perspective view of one corner of the cage, showing the manner in which the sides are joined together;

Figure 4 is a sectional view taken on lines 4—4 of Figure 3;

Figure 5 is a perspective view of two wire cages stacked one above the other;

Figure 6 is a sectional view showing the manner in which the vertical rods in Figure 5 are joined;

Figure 7 is a perspective view of a modified form of a wire cage;

Figure 8 is a perspective view of a fragmental portion showing the end wall construction in the modified form of Figure 7;

Figure 9 is a perspective view of a cage unit having a partition to separate the cage;

Figure 10 is a sectional view on line 10—10 of Figure 9 showing the manner of securing the parts together;

Figure 11 is a longitudinal edge view showing two adjoining wall sections extending in an end to end relation;

Figure 12 is a similar view showing two adjoining wall sections extending from each other at an obtuse angle; and

Figure 13 is a similar view showing two adjoining wall sections extending at an acute angle to each other.

The invention will be described in detail as embodied in an animal cage comprising a pair of side walls 10, a back wall 11, a top wall 12, and a bottom wall 13, and a front wall 14. Each of the walls comprises a plurality of elements or wires of one set 18 secured in any suitable manner such as by welding, soldering, or the like to right angularly extending elements or wires of another set 19. The front wall 14 is provided with a cut-out portion in which a door 15 is placed, the door being hinged as at 17 and having a suitable latch, such as a sliding bolt, as shown at 16. At the edges of each of the aforementioned walls, the one set of wires extends for a short distance and the wires are bent at approximately 90 degrees to the plane of the wall and in a general outward direction, the ends of each of the wires being reinforced by a bridging wire 20. As can be seen by the drawing, particularly Figures 3 and 4, the bending of the edges forms a corner 9. These corners 9 complement each other when one is intermeshed with the other, and a confined area, enclosure, or channel is formed (Figures 3 and 4). Pins 22 pass through the confined enclosure formed by the intermeshing of two adjacent end portions of two walls which, as can be seen by referring to Figure 4, preferably fill the entire area to maintain a tight joint. There is therefore formed a joint by virtue of a hinging action at the point of abutment of wires 20, which hinging action is prevented by corner pins 22. The corner pins 22 are preferably formed with a U bent portion 23 when utilized in connection with a cage (Figures 1 and 6) in order to space the bottom wall of the cage from the mounting surface thereof and have a ferrule 26 welded or otherwise fastened to the lower end thereof which serves as a foot. Additionally, a litter tray 24 may be provided to be placed underneath the body of the cage. As will be seen in Figure 1, the end of the U bent portion 23 of the corner pins 22 is inserted into the corners of the litter tray to hold it in spaced position below the bottom wall of the cage. Tying rods 25 of straight configuration but otherwise similar to pins 22 are provided to fasten together the remaining sides of the cage. Preferably these rods are of smaller diameter than pins 22, inasmuch as they need not support the weight of the cage.

When the cage in accordance with the invention is shipped in knockdown form with the walls separated, it may be readily assembled by placing two vertical walls, such as an end wall and a front wall, at right angles to each other on a flat surface with the curved ends facing outwardly, such as is shown in Figure 2 in the drawing. The two end portions are then intermeshed in the position as shown in Figures 3 and 4, and the corner rods 22 having bent portions 23 are inserted in the space formed by the outwardly bent edges so that the two walls will be in assembled relationship. The other two vertical walls may be assembled in the same manner and then the top and bottom walls may be engaged with the vertical walls by intermeshing the edges and inserting straight tying rods, making note to be sure that the outwardly curved edges of the bottom walls and the tie rods may be readily inserted therethrough. The litter tray may then be positioned beneath the cage and the ends of the vertical corner rods inserted in the corners thereof.

It is generally desirable to rack several cages one on top of the other so that several animals may be caged in a relatively small area. In proceeding with racking the cages, they are first assembled as has been described above and the litter tray placed underneath one of the cages. A second cage and litter tray having been assembled, the ferrule 26 (Figure 6) is then placed over the upper end of each of the corner posts 22 of the bottom cage, the corner posts of the second cage sliding into the ferrule 26 to effectively form a continuous rod of corner posts 22. It will be seen that with the particular form of corner post construction that I have provided, the U portions 23 serve to adequately space the cage and litter tray

and the ferrule construction serves to slightly space the litter tray from the top wall of the cage next below it when the cages are in racked form.

Referring more particularly to Figures 7 and 8, I have shown a modification of my cage wherein the reference numerals are in the 100 series, the tens and units thereof corresponding to like parts in the embodiment of Figure 1. The end walls **110** in this modification comprise extended vertical wires **119** which form U bent portions **123**. As will be readily apparent, these portions **123** are equivalent to the corner post **22** construction with portions **23** and serve as the mounting means for the cage. Additionally, the inwardly turned ends **122***a* serve as a shelf upon which a litter tray, such as **124**, may be placed.

The cage of Figure 7 is assembled in a similar manner to the cage of Figure 1. However, in this embodiment only a plurality of straight tying rods **122**, **125** are utilized to fasten the various walls **110**, **111**, **112**, **113**, and **114** together. As in Figure 1, these rods **122**, **125** pass through the trough or channel formed by the outwardly bent edges of the various walls.

Figures 9 and 10 illustrate a double cage which is provided with a partition wall **10***a* so as to divide the cage into two sections. In this particular form of construction there is provided two top walls **12***a* and **12***b* along with corresponding bottom walls **13***a* and **13***b* (not shown), the front, back, and side walls (**14**, **11**, and **10**, respectively) remaining unitary pieces. Referring particularly to Figure 10, there is shown in detail the manner in which the partition **10***a* is assembled into the cage. The vertical wires **19** extend beyond the extent of the partition dimensions a sufficient amount so as to allow two 90 degree bends such as at **27** and **28**, there being a reinforcing wire **20** placed at the end of wires **19** to hold them in position. The ends of the two top portions **12***a* and **12***b* may then be laid in the bent-over portions as shown in the drawing and tying rods **22***a*, **22***b* inserted in the channel formed by the interlocking end portions in the manner described in connection with the assembly of the various walls of the cage of Figure 1. A similar operation is effected with the bottom walls **13***a* and **13***b* (not shown) and the cage may be completed by affixing side, front, and back walls utilizing corner posts **22** with U bent portions **23**.

The invention may be embodied in various types of closures wherein the corners of wall sections may be made to extend at various angular relations to each other. In Figure 11 I have shown two adjoining wall sections in which the corners **9A** extend at an acute angle with the adjacent wall portion. These corners 9A intermesh in the manner previously described and are locked to each other by a tie rod **25**. Such an arrangement allows the wall sections to extend in end to end relation. It will be apparent that any plurality of such wall sections may be connected to each other to form a wall of infinite length. Each wall section may be made of a size to permit easy handling and packaging for shipment.

In Figure 12 I have shown two adjoining wall sections in which the corners **9B** extend at an acute angle but slightly greater than the angle of corner **9A**. These corners likewise intermesh in the manner preivously described and are locked together with a tie rod **25**. The angular relation of the corners **9A** allows the wall sections to extend from each other at an obtuse angle.

In Figure 13 the corners **9C** are made to extend at an obtuse angle, and this provides a wall construction in which adjoining wall sections extend from each other at an acute angle.

From the foregoing descripton it will be apparent that the angular relation of the corners **9** of the wall sections determines the angular relation between wall sections. Thus, by a choice of angle at which the corner extends from the wall sections, closures may be constructed having any of many polygonal perimeters. As by way of example, if it is desired to construct an enclosure for storing corn, or so-called corn crib, having a hexagonal perimeter, six vertical wall sections will be provided with corners **9** which extend at the proper angle, which may be readily computed depending upon the diameter of the wire and the diameter of the tie rod **25**.

I claim:

1. A closure having adjoining walls, said walls having a general rectangular shape and comprising spaced crossed wires, said wires being disposed at substantially right angles to each other, an end wire of one wall being disposed at the end of one set of crossed wires extending in one direction and joined thereto, the marginal edge of the wall at said end wire being bent outwardly from the plane of the wall to form a corner portion, said corner portion having wires extending in only one direction therein and consisting of the wires joined to said end wire, the wires in said corner portion being passed through the spaces between wires similarly disposed in the other wall in intermeshing relation to form a confined enclosure between the wires in the other wall and the wires of said corner portion, and a joining element received in said confined enclosure to lock said walls against separation and thereby secure said walls to each other.

2. A closure according to claim 1 wherein said adjoining walls extend in an end to end relation.

3. A closure according to claim 1 wherein said adjoining walls extend at an acute angle to each other.

4. A clsoure according to claim 1 wherein said adjoining walls extend at an obtuse angle to each other.

5. A closure having adjoining walls, each wall comprising spaced apart crossed wires fixedly secured to each other at their crossing point, said wires being disposed at substantially right angles to each other and with the end wire of the wall wires extending in one direction being positioned at the end extremity of the wires extending in the other direction, the marginal edges of said walls being bent outwardly from the plane of the walls to form a corner portion free of cross wires for passing the wires at said corners past each other in intermeshing relation to form a confined enclosure between adjacent walls and the end cross wires of said adjacent walls, and a joining element received in said confined enclosure to lock said corners against separation and thereby secure said walls to each other.

6. A closure as set forth in claim 5 wherein said joining elements extend beyond the lower edges of said walls and each has a ferrule affixed to the lower end thereof to be engaged with the upper end of corresponding elements of another closure.

7. A closure as set forth in claim 5 wherein said joining elements extend beyond the lower edge of said walls and said extending portion is bent to provide a U-shaped portion with the opening thereof facing towards said walls, and a litter tray is provided, said litter tray nesting in said U-shape portions.

8. A closure having at least four right angularly extending walls formed of lengths of parallel disposed wires extending generally horizontally and connected at their end extremities with a vertical cross wire and fixedly secured to said parallel wires at the crossing thereof, said horizontal wires being bent outwardly at their end portions to form a corner, the said walls intersecting each other at substantially right angles to each other inwardly of said corners and with the horizontal wires at said corners passing between each other in intermeshing relation to form a confined enclosure between the point of crossing of said horizontal wires at the juncture of said walls and the point of crossing of said horizontal wires at the point adjacent said vertical cross wires, and a rod extending through said enclosure to block separation of said walls at said juncture thereof.

9. In a closure having walls, a partition disposed normal to two end-to-end abutting aligned wall sections, said partition comprising a plurality of spaced parallel

wires connected together at their end extremities with an end wire, said parallel wires being bent into a U shape at the ends thereof with one leg of the U being in the plane of said wires, said U-shaped end forming two corners, said aligned wall sections being joined to said partition at right angles thereto and at each side thereof, each of said wall sections having a plurality of parallel wires connected together at their end extremities with an end wire, said parallel wires being bent outwardly at the ends thereof to form a corner inwardly of the end wires, each wall section corner intermeshing with a corner of the U-shaped extremity of said partition to form two confined corners, and joining elements received in said confined corners to secure the walls together.

10. A closure having two identical adjoining walls disposed at substantially right angles to each other, each wall comprising a plurality of parallel wires fixedly secured to each other at their end extremities with end wires disposed at substantially right angles to said parallel wires, the parallel wires being bent outwardly at the ends thereof from the plane of the wall to form a corner inwardly of the end wires, said wall portion being connected to the other wall portion by passing the bent wires of the adjacent corner portion between each other in intermeshing relation so that said end wires abut to form a confined corner, and a joining element received in said confined corner to secure the walls together.

11. An animal closure comprising front, back, side, top, and bottom walls, each of said walls comprising two sets of crossed spaced apart parallel elements disposed at right angles to each other and fixedly secured to each

other at their crossing point, the end elements of each of said sets being positioned at the end extremity of the elements of the other set, the end portions of said elements at the juncture of said walls being bent outwardly, said outwardly bent portions intermeshing to form a confined area, and a joining element passing through each of said areas.

12. A closure as in claim 11 wherein said joining element is a rod.

13. A closure as in claim 11 wherein said elements are wires.

14. An animal wire screen closure having front, back, and side walls, the wires of said screen material being disposed at right angles to each other and the edges of said walls terminating at a cross wire, said walls being disposed at substantially right angles to each other at a location inwardly of the marginal edges thereof, said marginal edges being bent outwardly to form a corner for passing the wires at said marginal edges past each other in intermeshing relation with the said corner portions positioned opposite to each other to form a confined enclosure between the juncture of said walls and said cross wires and a joining element extending through said enclosure to block separation of said corner portions and thereby secure said walls to each other.

References Cited in the file of this patent

UNITED STATES PATENTS

1,669,300	Hunter	May 8, 1928
2,137,739	Gatch	Nov. 22, 1938
2,239,483	Cocks	Apr. 22, 1941