July 11, 1950 W. G. HARRIS 2,515,084

KNOCKDOWN ENCLOSURE FOR ANIMALS

Filed July 2, 1946 2 Sheets-Sheet 1

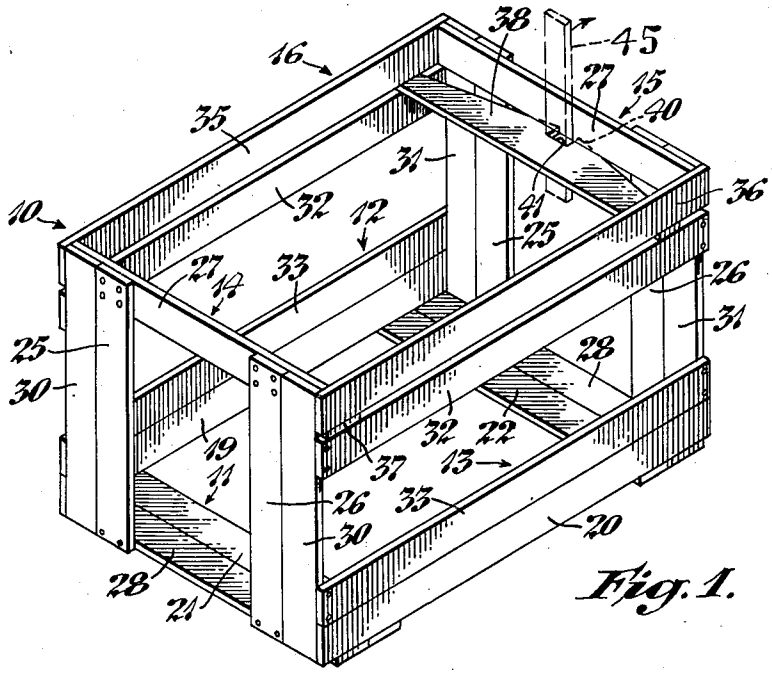


Fig. 1.

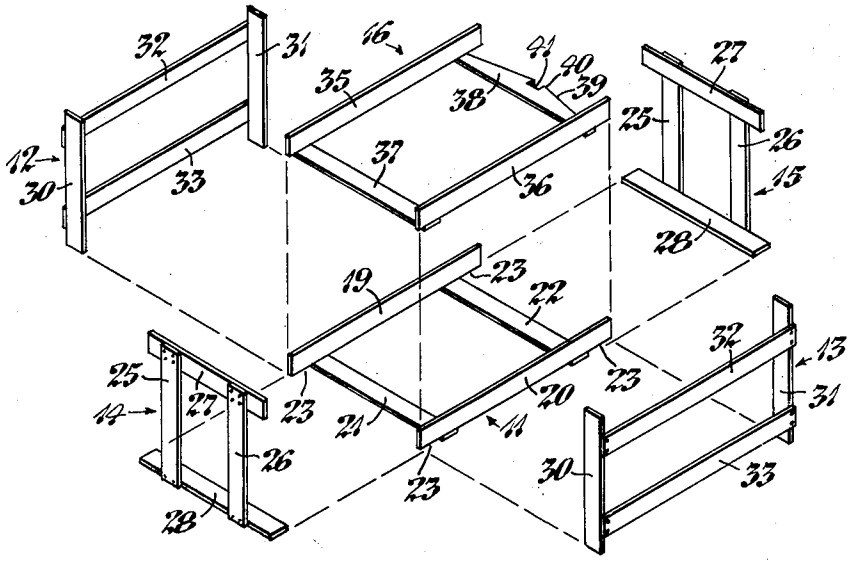


Fig. 2.

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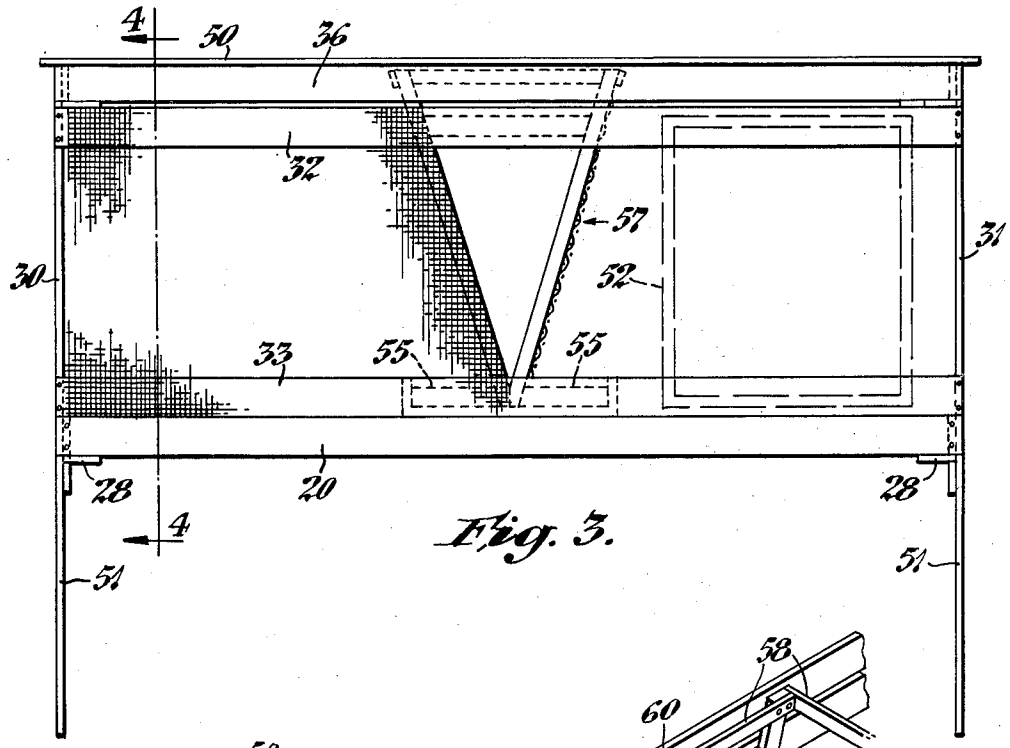


Fig. 3.

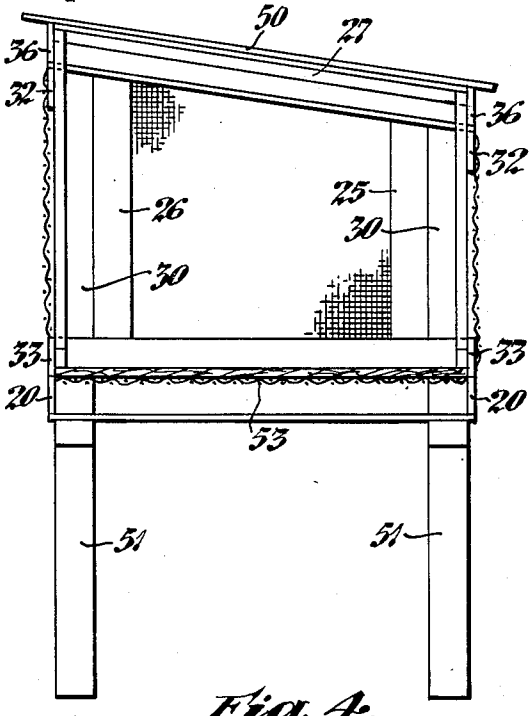


Fig. 4.

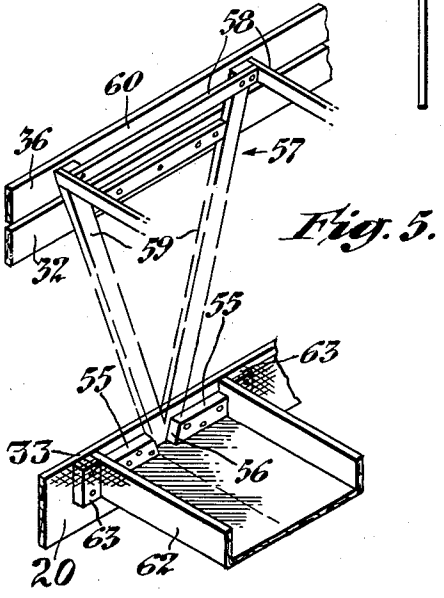


Fig. 5.

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UNITED STATES PATENT OFFICE

2,515,084

KNOCKDOWN ENCLOSURE FOR ANIMALS

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Application July 2, 1946, Serial No. 680,882

6 Claims. (Cl. 119—20)

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My invention relates to structures and particularly to improvements in structures of a knock-down character.

One object of the invention is to provide a knock-down structure which is applicable to use in making crates and constructing buildings, and various enclosures, such as portable or permanent homes, animal pens, coops, and other constructions.

Another object is to provide a structure of the type indicated, which is composed of panels adapted to form the top, bottom, sides, and ends of an enclosure, the several panels being adapted to be interconnected without the use of screws, nails or other extraneous fastening devices.

Another object is to provide a structural unit of the character referred to in which the several panels brace one another when assembled together, thereby greatly strengthening the construction and adding rigidity thereto.

Another object is to provide a structural unit of the type specified composed of parts which may be conveniently and inexpensively mass-produced in box-making machinery and readily assembled as needed, the parts being of a relatively flat nature to adapt them to be stacked during shipment and storage.

Another object is to provide a structural unit which is particularly adapted for use in forming knock-down pens, hutches, and coops for housing small animals and birds, and it is a further object to provide, in an enclosure of this type, a combined partition and feeding trough, which may be quickly and easily assembled within the structure.

Further objects of my invention are set forth in the following specification, which describes two embodiments thereof, by way of example, as illustrated by the accompanying drawings. In the drawings:

Fig. 1 is a perspective view of a knock-down structure embodying the features of my invention;

Fig. 2 is a perspective view, in reduced scale, illustrating the several parts or panels in disassembled relationship;

Fig. 3 is a front elevational view of my improved structure, showing it as embodied in an enclosure suitable for housing small animals or birds;

Fig. 4 is a cross-sectional view of the enclosure, taken on line 4—4 of Fig. 3; and

Fig. 5 is a fragmentary perspective view of the central portion of the enclosure shown in Figs. 3 and 4, showing the means for securing a combined partition and feeding trough in place therein.

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Referring to the drawings in detail, my improved knock-down structure is shown in Figs. 1 and 2 as embodied in a rectangular enclosure, such as a crate 10. The crate 10 consists of a base or bottom panel 11, side panels 12 and 13, end panels 14 and 15, and a top panel 16. The bottom panel 11 comprises longitudinal side strips 19 and 20 connected adjacent their ends by lateral cross-strips 21 and 22, which may be attached thereto by nails, screws, staples, or any other suitable fastening means. The cross-strips 21 and 22 are spaced inwardly from the ends of the longitudinal strips 19 and 21, thus defining spaces 23 beneath the ends of the strips 19 and 20.

Each end panel 14 or 15 comprises a pair of spaced upright strips 25 and 26, to the upper and lower ends of which are fastened lateral parts 27 and 28. The upper part 27 is arranged with the plane of its major axis disposed vertically while the lower part 28 is positioned with the plane of its major axis horizontally to adapt it to fit in the spaces 23 when the end panel 14 or 15 is attached to the base 11.

Each side panel 12 and 13 consists of a pair of spaced vertical members 30 and 31 connected by lateral cross-strips 32 and 33, which are spaced from the ends of the members 30 and 31 a distance substantially equal to the width of the stock used in the structure.

The top panel 16 consists of a rectangular frame having longitudinal side strips 35 and 36, which are arranged with the plane of their major axis vertical. The strips 35 and 36 are connected at one end by a lateral piece 37 and at the other end by a laterally extending locking element 38. The lateral piece 37 and locking element 38 are arranged with the plane of their major axis horizontal. The locking element 38 constitutes the means for locking the several panels in assembled relationship, and its outer edge 39 may taper inwardly to provide a central obtuse point 40, which is formed with a slot 41.

With the several frame-like panels constructed in the manner above explained, they may be stacked, one upon another, and bundled to facilitate shipping and storage. When the crate is to be constructed, the several panels are assembled as follows:

With the base panel 11 resting upon a flat surface in the position shown in Fig. 2, each end panel 14 and 15 is held in upright position and

moved toward the ends of the panel 11 to slide the lower parts 27 and 28 in under the projecting ends of the longitudinal strips 19 and 20 and with their inner edges abutting the edge of the strips 21 and 22. Each side panel 12 and 13 is then held in the erect position illustrated in Fig. 2 and moved laterally inward to cause the upper ends of its vertical members 30 and 31 to straddle the projecting ends of the lateral parts 27 and 28. The side panels 12 and 13 are then slid downwardly to cause the lower ends of their vertical members 30 and 31 to engage the outer edges of the ends of the lateral parts 27 and 28 to lock the end panels 14 and 15 in place. The side panels 12 and 13 thus will be held against lateral displacement by the outer ends of the longitudinal strips 19 and 20 of the base panel 11. It will be noted that, as thus far described, the several panels or sections, 11, 12, 13, 14, and 15, are so disposed and interlocked that they brace one another to provide a strong rigid structure. While at this juncture it is possible to disassemble the several sections by merely sliding the side panels 12 and 13 upwardly, such sliding movement is prevented by the application of the top section 16 to the box-like enclosure.

To close the crate and thus lock its several sections in assembled relationship, the top section 16 is placed against the side panels 12 and 13 and held slightly inclined with its lateral piece 37 resting upon the top edges of the strips 32. By sliding the top section 16 longitudinally, the outer edge of its connecting piece 37 is positioned in under the lower edge of the lateral part 27 of one end panel 14. The opposite end of the top section 16 is then forced downwardly to cause its locking element 38 to slide against the inner surface of the upper part 27 of the end panel 15 and finally snap under the lower edge of the part 27, the locking element 38 and part 27 springing slightly to accommodate this operation. It will be apparent from the above that the top section 16 retains the side panels 12 and 13 in assembled position and thus prevents disassembly of all the sections. The outer ends of the longitudinal strips 35 and 36 of the top section 16 straddle the upper ends of the vertical members 30 and 31 of the side panels 12 and 13, and since the lateral piece 37 and locking element 38 abut the upright strips 25 and 26 of the end sections 14 and 15, respectively, the top section is prevented from lateral and longitudinal displacement.

It will thus be noted that all of the several sections of the crate are interlocked, one with another, to retain them in the assembled relationship shown in Fig. 1. While the drawings show the panels as merely comprising frames for the sake of clarity, it will be understood that the frames may be suitably covered with slats, wood veneer, wire mesh, or other materials, to provide a closed box-like structure capable of holding various objects. Moreover, the structure illustrated in Figs. 1 and 2 may be made relatively large to adapt it for use as the frame of a portable home, garage, or other building.

To collapse the structure shown in Figs. 1 and 2, a suitable tool or bar 45, indicated by dotted lines in Fig. 1, is inserted in the slot 41 of the locking element 38 and pivoted to pry the element away from the end panel 15 to free the top section 16 to permit disassembly of the latter from the structure. The several panels then may be disconnected by reversing the assembly procedure explained above.

It has been stated that the improved knock-down structure may be advantageously employed as a pen, coop, or hutch for small animals and birds, and in Figs. 3, 4, and 5, the structure is shown as embodied in a double-compartment rabbit hutch. The hutch structure utilizes panels or sections which are similar to the sections described in connection with the embodiment of the invention shown in Figs. 1 and 2 and therefore will not be described in detail. For the sake of simplicity, the parts which are similar to those described previously are designated by like reference numerals. In adapting the structure for use as a rabbit hutch or similar enclosure, I prefer to so form the end panels 14 and 15 that their lateral parts 27 slope downwardly and to make the rear side section 13 of the same height as the reduced sides of the end panels. With the ends and rearward side of the structure thus modified a sheet 50 may be secured to the top of the enclosure to serve as a sloping roof. In this alternative construction, the vertical members 30 and 31 may be extended downwardly to provide legs 51 for supporting the hutch. The sides and ends of the enclosure may be covered with wire mesh and suitable doors 52 may be provided in the front thereof. A wire mesh floor 53 may also be provided, the edges of the meshed floor being held between the horizontal parts of the side and end panels, as indicated in Fig. 4.

Each of the lower longitudinal strips 33 of the side panels is provided with a pair of spaced blocks 55 having inclined ends to form a substantially V-shaped notch 56 for receiving the lower V-shaped ends of a hay-rack 57. The rack 57 consists of an upper rectangular frame portion 58 and depending corner strips or legs 59, which converge to form the V-shaped ends referred to above. The sides of the rack 57 may be provided with slats or wire mesh to provide the trough-like rack adapted to contain hay or other food. To retain the rack 57 in upright position, a bar 60 is secured to the strips 32 of the side panels 12 and 13 between the inclined legs 59, as clearly shown in Fig. 5. A trough or tray 62 extends between the front and rear side panels 12 and 13 adapted to hold food, and the ends of the trough may be provided with or secured to blocks 63 on the members 33. The hay-rack 57 and trough 62 together provide a partition for dividing the structure into two compartments.

It will be observed from the foregoing that my invention provides a simple and efficient knock-down structure, which may be utilized in forming crates and other receptacles and in constructing buildings and enclosures, such as portable or permanent houses, animal pens, coops, and other constructions. The improved structure may be quickly and easily erected and conveniently disassembled. As a particular feature of improvement, the present structure is composed of simple panels or sections which lend themselves to mass production methods and which interlock, one with another, when assembled, thereby enabling them to be joined together without the use of screws, nails, or other extraneous fastening devices. The parts of the sections act to brace one another and thus the structure is made strong and rigid. It will also be observed that my improved knock-down structure is especially adapted for use as cage or hutch for small animals, and this embodiment has been herein illustrated, this embodiment also including a feeding rack, which may be conveniently assembled and disassembled within the cage.

While I have herein shown and described my

improved knock-down structure, as embodied in two preferred forms of construction, by way of example, it will be readily understood that modifications may be made in the form and arrangement of its parts without departing from the spirit or scope of the invention. Therefore, without limiting myself in this respect, I claim:

1. A knock-down structure, comprising: a rectangular bottom section having longitudinal side members and lateral connecting members connected to said longitudinal side members, the latter projecting beyond the lateral connecting members; a pair of rectangular end sections, each including vertical bars and lateral bars connected to and projecting beyond said vertical bars, the lowermost lateral bars of said end sections being adapted to underlie said projecting ends of said longitudinal side members of said base member, the uppermost lateral bar of one of said end sections being resilient; a pair of rectangular side sections, each including longitudinal strips and vertical strips at the ends thereof, the ends of said vertical strips projecting beyond said longitudinal strips, said side sections being adapted to be disposed within said side members of said bottom section with the upper and lower projecting ends of their vertical strips overlying said lateral bars of said end sections to retain said end sections and said bottom section in connected relationship, said side sections being held against lateral and longitudinal movement by the engagement of its vertical strips with said longitudinal and lateral members of said bottom member; and a rectangular top member including lateral elements and longitudinal elements connected to and projecting beyond said lateral elements, one of said lateral elements being provided with an extension, said top member being adapted to be disposed with the ends of its lateral elements resting upon said longitudinal strips of said side sections and with one of its lateral elements underlying the upper lateral bar of one of said end sections and with the projecting ends of its longitudinal elements overlapping the outer sides of said vertical strips of said side sections, the extension of the other of said lateral elements being adapted to snap under said resilient lateral bar of the other of said end sections to releasably retain all of said sections in assembled relationship.

2. A knock-down structure, as defined in claim 1, in which said lateral element of said top section is substantially triangular in outline, with the apex of said triangle outline providing said extension.

3. A knock-down structure, as defined in claim 1, in which said lateral element of said top section is provided with a notch to facilitate flexing said resilient lateral bar horizontally so as to release said extension from beneath said resilient lateral bar of said end section to permit disassembly of all of said sections.

4. A knock-down structure, as defined in claim 1, in which the vertical members of one of the latter sections are extended downwardly beyond said bottom section to provide legs for supporting said structure.

5. A knock-down structure, as defined in claim 1, in which the vertical members of one of the latter sections are extended downwardly beyond said bottom section to provide legs for supporting said structure; and a vertical partition extending between the side sections of said frame, and removable vertically from the interior of the frame.

6. A knock-down structure, as defined in claim 1, in which the vertical members of one of the latter sections are extended downwardly beyond said bottom section to provide legs for supporting said structure; and a V-shaped rack disposed between the side sections of said frame and removable vertically from the interior of the frame.

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