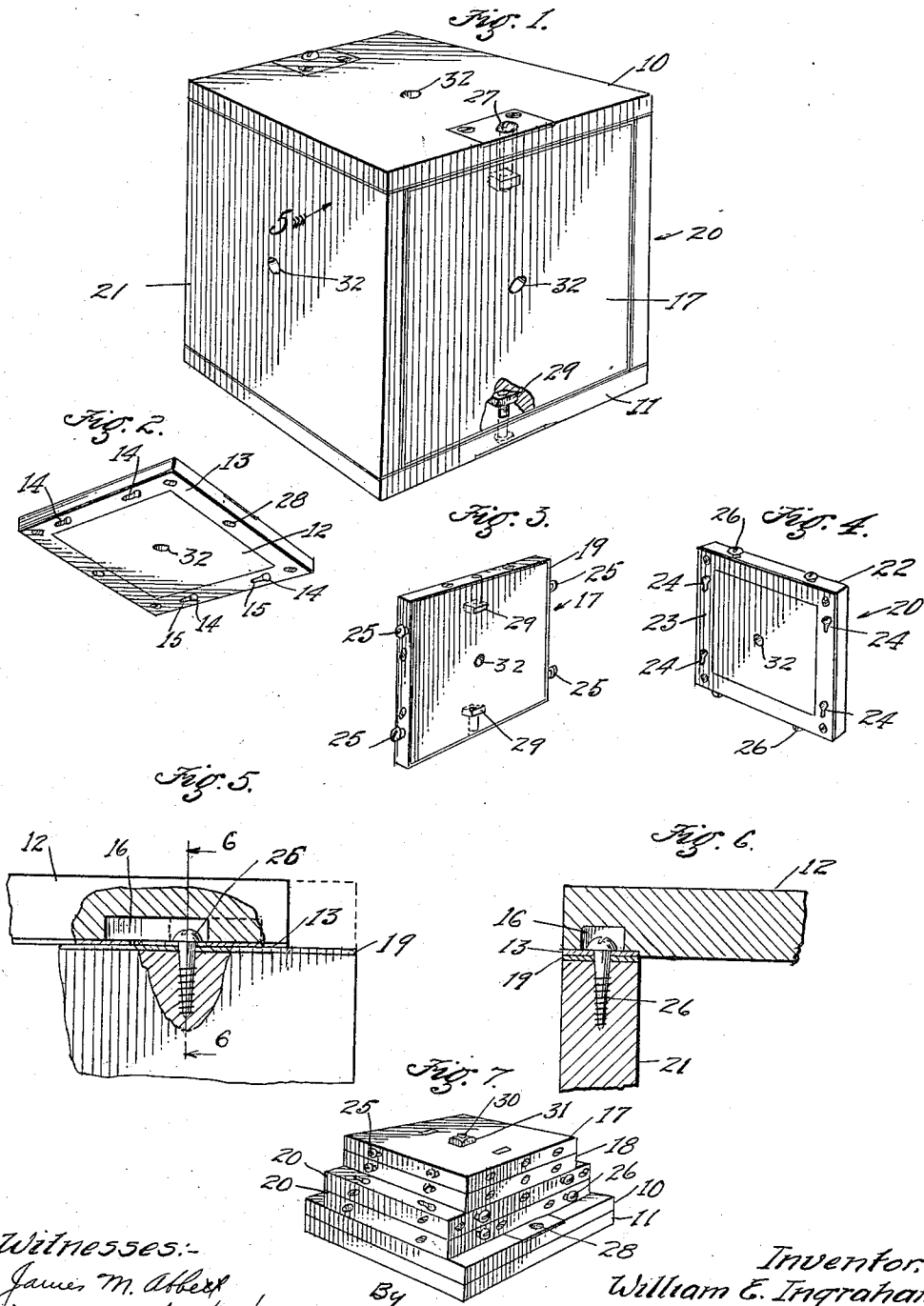


W. E. INGRAHAM.
KNOCKDOWN BOX.
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1,176,679.

Patented Mar. 21, 1916.



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UNITED STATES PATENT OFFICE.

WILLIAM E. INGRAHAM, OF REDONDO BEACH, CALIFORNIA.

KNOCKDOWN BOX.

1,176,679.

Specification of Letters Patent.

Patented Mar. 21, 1916.

Application filed November 23, 1914. Serial No. 873,499.

To all whom it may concern:

Be it known that I, WILLIAM E. INGRAHAM, a citizen of the United States, residing at Redondo Beach, in the county of Los Angeles, State of California, have invented new and useful Improvements in Knock-down Boxes, of which the following is a specification.

This invention relates to a knock-down box or crate.

It is the object of this invention to provide a box or crate in which the sides, ends, top and bottom members may be separated and stacked to render the box compact when not in use and to economize space in shipping same.

Another object is to provide an effective means for detachably connecting the various members of the box together to form a rigid structure, with the parts securely connected together against displacement.

Another object is to provide a means for detachably locking the various box members together, so constructed and arranged that the box cannot be dismembered without first removing the top and bottom portions thereof.

A further object is to provide a knock-down box in which the use of hinged connections and spring clips is obviated and in which the connection between the various box members is effected by means of a headed pin and slot construction.

The invention is illustrated in the accompanying drawings, in which:

Figure 1 is a perspective view of the box illustrating it as assembled and with parts broken away. Fig. 2 is a view in perspective of the box cover as seen from its under side. Fig. 3 is a perspective view of one of the box ends. Fig. 4 is a perspective view of one of the side members of the box. Fig. 5 is a detail in side elevation of the upper corner portion of the box, as seen in the direction indicated by the arrow 5 in Fig. 1, with parts broken away, illustrating the manner in which the cover of the box is applied and moved to its closed position. Fig. 6 is a sectional view on the line 6—6 of Fig. 5, as seen in the direction indicated by the arrows. Fig. 7 is a view in perspective illustrating the box sections as dismembered and stacked in their knocked-down position.

More specifically, 10 and 11 indicate the top and bottom members of the box, which are of corresponding construction, and each

consists of a rectangular panel 12 of the desired dimensions, on one face of which a metallic plate or frame 13 is permanently attached; the plate 13 extending along the marginal edges of the panel 12, as particularly shown in Fig. 2.

Formed on the opposite side portions of the plate 13, are alined perforations 14, preferably of circular configuration, and of any suitable number, according to the size of the panel 12. Correspondingly extending slots 15 are formed in the plate 13 and connect with the perforations 14 to form what is termed key-hole slots, adapted to receive pins or studs, as will be later described. The panel 12 is formed with recesses 16 rearward of the key-hole slots to receive the headed studs engaged by the latter.

The box is provided with rectangular end panels 17 and 18 of complementary construction, which panels are fitted with metallic bands 19, extending around their edges, as particularly shown in Fig. 3. The side panels 20 and 21 of the box are also rectangular in form and are fitted with metallic bands 22, which extend around their edges and are also provided with plates 23, mounted on one of their faces, which plates are arranged to extend adjacent the vertical edges of the side panels, as particularly shown in Fig. 4. The plates 23 are formed with alined key-hole slots 24, and the side panels are recessed behind the said slots to receive headed studs 25, mounted on the vertical edges of the end panels 17 and 18. The side panels 20 and 21 are provided with headed studs 26 on their upper and lower edges, which are adapted to extend into the key-hole slots formed on the top and bottom members 10 and 11.

In assembling the box the side and end members are first connected together by introducing the headed studs 25 on the end members 17 and 18 into the key-hole slots 24 of the side members 20 and 21 and shifting the side and end members longitudinally in relation to each other to effect the engagement of the headed studs 25 by the narrower portions of the key-hole slots 24. The end panels 17 and 18 will then be positioned between the side panels 20 and 21 in the position shown in Fig. 1, and will be securely held in place by the pin and slot connection. The bottom panel 11 is then placed in position with the headed studs 26 on the side panels 20 and 21 engaging the

key-hole slots on the bottom member; the headed portions of the studs being introduced through the perforations 14, as shown in Fig. 5, whereupon the panel 12 is shifted from the position shown in full lines in Fig. 5 to the position indicated in dotted lines therein, to dispose the headed portion of the studs 26 in engagement with the marginal edges of the slots 15, thus connecting the panel 12 to the side and end members of the box. The top 10 of the box is then placed in position in like manner.

To securely hold the parts against accidental disengagement, screw-headed bolts 27 are inserted through perforations 28 in the top and bottom members 10 and 11 adjacent the edges thereof, and are screwed into engagement with threaded nuts 29 embedded in the end panels 17 and 18 in the opposite edges thereof, and arranged across bores formed in the end panels to receive the bolts 27.

To dismember the box the bolts 27 are disengaged from the nuts 29, whereupon the top and bottom panels 10 and 11 may be shifted longitudinally to disengage the headed studs 26 from the key-hole slots formed by the perforations 14 and slots 15. On removing the cover 10 and bottom member 11, the side panels 20 and 21 may be disconnected from the end panels 17 and 18 in like manner. The side panels, end panels and top and bottom panels are then

stacked, as shown in Fig. 7, and a bolt 30 fitted with a nut 31, is introduced through the various panels to bind the latter together, as illustrated in Fig. 7; the various panels being provided with a central perforation 32 to receive the bolt 30.

What I claim is:

A knock-down box comprising complementary end panels, headed studs on the vertical edges of said end panels, threaded nuts arranged across vertically extending bores in the top and bottom edges of the end panels, complementary side panels, metallic frames secured thereto having key-hole slots adapted to receive and engage the headed studs on the end panels, headed studs on the upper and lower edges of the side panels, metallic frames on the complementary top and bottom panels having key-hole slots adapted to receive and engage the headed studs on the side panels, and bolts adapted to be passed through the top and bottom panels and threaded into engagement with the nuts carried by the end panels to lock the various panels against displacement in relation to each other.

In witness that I claim the foregoing I have hereunto subscribed my name this 6th day of November, 1914.

WILLIAM E. INGRAHAM.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."