

H. KOREN AND D. A. CLARK.

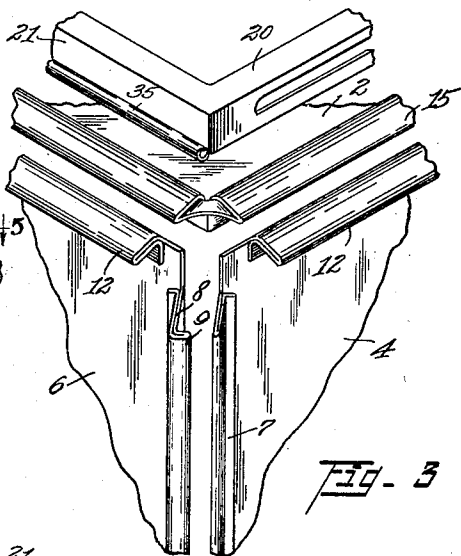
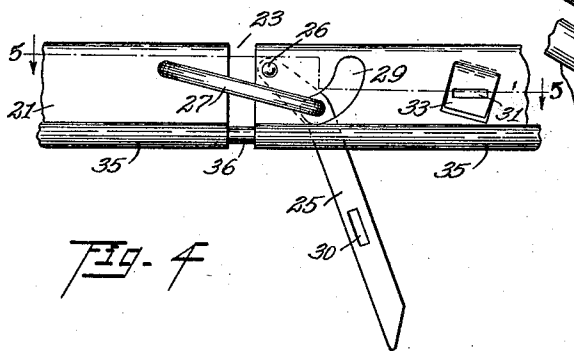
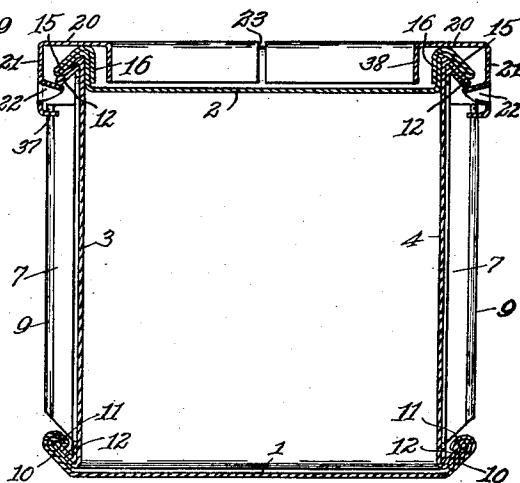
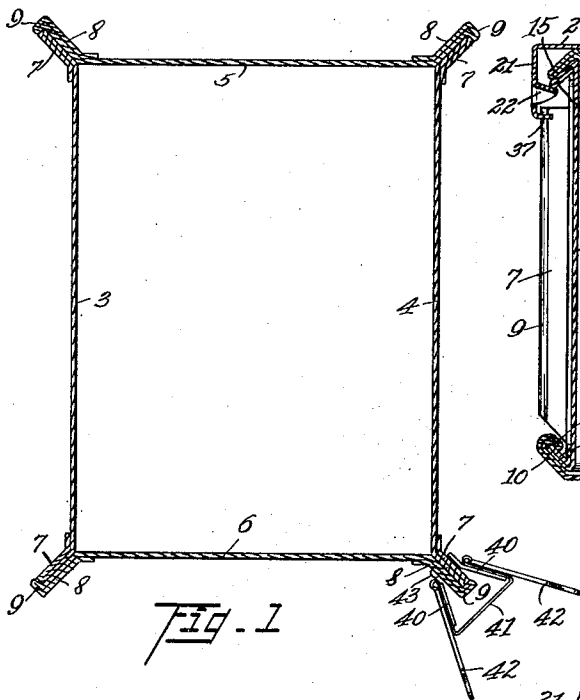
BOX.

APPLICATION FILED SEPT. 5, 1914.

Patented Oct. 14, 1919.

2 SHEETS—SHEET 1.

1,318,772.



Witnesses:

R. L. Bruck
H. Small.

Inventors

Harald Koren and
Don A. Clark
Hull & Smith, Attys.

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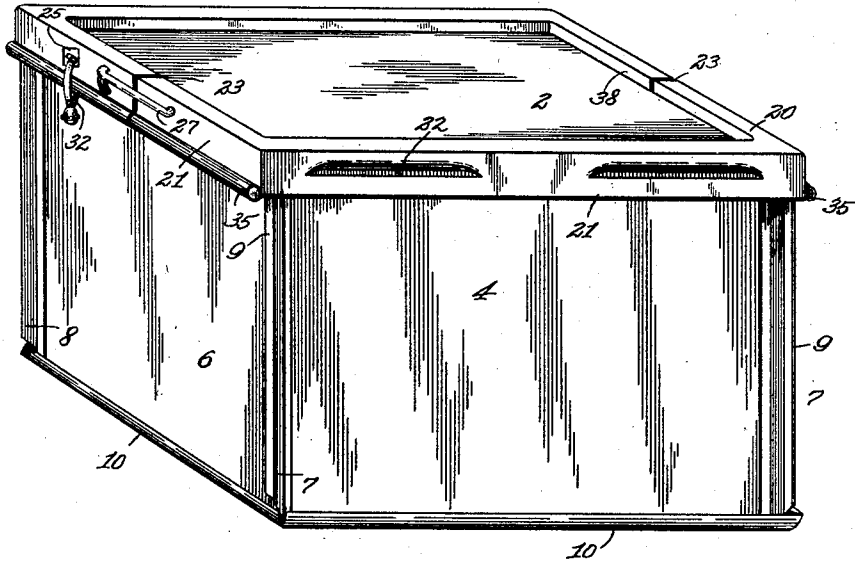


Fig. 6

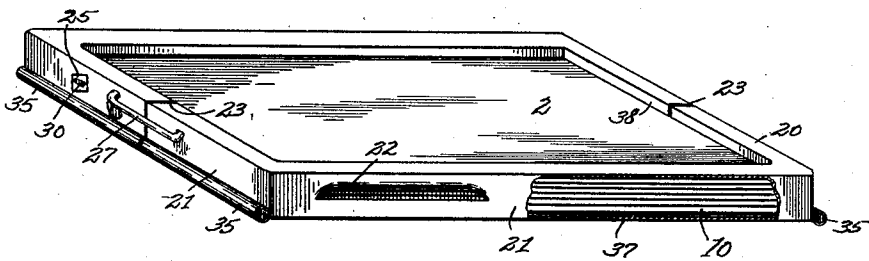


Fig. 7

Witnesses:

R. L. Bruck.
H. J. Small.

Inventors

Harold Koren and
Don A. Clark
Hull & Smith Attys.

UNITED STATES PATENT OFFICE.

HARALD KOREN AND DON A. CLARK, OF CLEVELAND, OHIO, ASSIGNORS TO THE
DIAMOND STAMPING WORKS COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

BOX.

1,318,772.

Specification of Letters Patent.

Patented Oct. 14, 1919.

Application filed September 5, 1914. Serial No. 860,497.

To all whom it may concern:

Be it known that we, HARALD KOREN and DON A. CLARK, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Boxes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

10 This invention relates to the general class of containers in which goods, wares and merchandise can be packaged for purposes of storage or transportation; and the general object of the invention is the provision of a construction and arrangement of parts permitting a box or like container to be made of sheet metal with a weight not materially if any greater than that of the lightest practical wooden box of like size, while having a strength far in excess of any wooden container. Other objects of the invention are the provision of a metal box having an improved corner and edge construction, permitting the box to be constructed of a minimum of parts, while possessing a maximum of strength and tightness; the provision of a metallic box construction having a symmetrical arrangement of members; the provision of a metal box having a smooth interior; 30 the provision of a box which may be made of thin metal and with a minimum number of operations; the provision of a box that can be operated by a single person under all conditions and which can be used and reused many times without becoming so damaged in transit as to become worthless; the provision of a box of such construction that upon damage in transit it can easily be repaired; the provision of new and improved means for securing together the members of the box and for sealing the same whereby access of its contents may be prevented; the provision of a container of this character which can be readily knocked down for return to its starting point; the provision of devices for securing together the parts of the box after being knocked down so that the same may not become misplaced and lost; while further objects and advantages of the 50 invention will become apparent as the description proceeds.

For reasons fully set forth in our copending application Serial No. 860,496 of even date herewith each side of our improved box is preferably formed from a single plate of sheet metal by first folding over the marginal edges of the plate, and afterward stamping or drawing the same so as to give it a tray or dish form having the folded portion as a rim. This operation adds strength to the edges by reason of the folding and the drawing, thus forming a kind of frame, and also stretches the metal of the sheet or web thereby placing it under tension and safeguarding the same against denting or deformation. The angle between this rim and the metal of the web is preferably substantially either 45° or 135°, so that when adjacent box members are brought together the adjacent rims make close facial contact with each other, thus permitting their securing together in any one of several different ways and increasing the stiffness of the framework above mentioned. Also in many cases certain of the rims are formed with a lip or flange adapted to embrace the edges of the abutting rims so as to prevent side shifting. In other cases particular modifications of this rim structure are adopted for the purpose of securing the parts together and of permitting the coöperation of the locking means therewith.

Also in order to compete with wooden boxes a metal box must ordinarily be constructed so as to stand a plurality of trips, which necessitates return from destination to point of shipment in each instance, and this return practically necessitates such a knock-down construction as to permit it to be returned folded thus saving transportation charges. The provision of a knock-down construction is not so difficult as is the provision of some means to secure together the various parts of the box after being knocked down so as to preserve these members against injury or loss.

To this end our invention includes a kind of collar arranged to receive the various parts of the box when in knock-down condition and retain the same during reshipment, said collar being also employed as a clamp to hold the parts of the box in assembled

condition during use without the necessity of further fastening, and also preferably to provide a hand-hold whereby the box may be handled.

5 All the above requirements and advantages, together with others soon to be described, are combined in the constructions illustrated in the drawings accompanying and forming a part of this application, although it will be understood that other specific constructions than the one here illustrated could be adopted within the scope of our invention and within the meaning of the claims hereto annexed. In the drawings: Figure 1 represents a horizontal, sectional view taken through a box of our invention; Fig. 2 represents a vertical, transverse, cross-sectional view through the same box; Fig. 3 is a perspective view illustrating in enlarged scale the edge and corner construction of our improved box, the parts being slightly separated in order to show their individual shape; Fig. 4 represents in side elevation a portion of the collar; Fig. 5 is a horizontal sectional view taken upon the line 5—5 of Fig. 4 and looking downwardly; Fig. 6 is a perspective view of a complete assembled box constructed in accordance with our invention; and Fig. 7 is a view of the same box in knockdown condition with the parts secured together for reshipment.

Describing the parts by reference characters, 1 represents the bottom, 2 the top, 3 and 4 the sides, and 5 and 6 the ends of our improved box. In this specification 3, 4, 5 and 6 will be denominated generally as "side members." Each of the box members is formed of a smooth, flat plate of thin sheet metal having at its margin a stiffening and securing rim, bent outwardly from the plane of the plate. Each of the members has its opposite-rims substantially symmetrical so as to permit it to be assembled in either position indiscriminately, these rims being generally not identical with the engaging rims of the adjacent members, but complementary thereto. Thus, in the embodiment here shown, the margins of the sides 3 and 4 are formed at their ends with plain outturned rims 7—7, projecting outwardly at an angle of approximately 135°. Similarly the ends 5 and 6 are provided with marginal rims 8—8, whose extremities are formed with laterally turned lips or flanges 9 adapted to overlap the rims of the adjacent members.

The bottom member 1 is preferably formed at each of its margins with a rim 10 turned upwardly at an angle of 135° and having its marginal portion folded over inwardly as at 11—11 so as to define an open groove or pocket. Each of the upright members 3, 4, 5 and 6 is formed at its lower edge with an outwardly turned rim 12, arranged at an

angle of substantially 45° so as to permit its being hooked under the corresponding lip 11. The width of the groove defined between the lip 11 and rim 10 is preferably such as to receive snugly the entering rim 12, and the length of the various rims is preferably such as to cause them to become seated all at the same time whereby a bracing effect is produced. Each of the side members 3, 4, 5 and 6 is preferably formed at its upper edge with a rim which is exactly the counterpart of that at its lower edge, and indicated on the drawings by the same reference characters, this construction serving to facilitate considerably the manufacture of the box and also to permit it to be assembled with a minimum of care and attention.

Each of the rims above mentioned is preferably formed by first folding over outwardly the metal of the plate or blank so as to double its thickness and add to its stiffness. The rims are then formed preferably by a drawing operation between dies, whereby the metal of the web is displaced away from the rims, thus stretching the metal and placing it under tension. These angles or creases are preferably located within the folded portions of the plates so as to take advantage of the bracing action afforded thereby.

With the construction so far described, the box sides, when attached to the base member and drawn into upright position, define an outwardly and downwardly sloping seat for the reception of the cover member, and this cover member is formed at each margin with an outwardly and downwardly sloping rim 15 adapted to rest thereon. Also, in order to prevent the collapsing of the side members, the cover member is also preferably formed with an abrupt shoulder 16 inside of the sloping portion and adapted to engage and back up the side members as shown in Fig. 2. The marginal portions of the cover member are preferably reinforced by folding as in the other cases. It will be seen that when this cover is secured in place the box as a whole will become a rigid unyielding structure and resistant both to interior and exterior pressure.

For securing this cover in place we have devised a peculiar clamp or collar which consists essentially of a rectangular metal frame having a top 20 adapted to rest upon the uppermost portion of the cover, and surrounded by a depending skirt 21 adapted to surround and conceal the rims 15. At the sides of the collar these skirts are formed with inwardly projecting ears 22 adapted to engage beneath the rims 12 of the side members while the collar is entirely severed at its ends as shown at 23—23 to permit the lateral movement necessary

to the engagement and disengagement of these ears. Suitable means is provided for drawing together the two halves of this collar so as to force the ears beneath the rims 12—12 and draw the cover forcibly in place, the means here shown consisting of a lever 25 pivoted to the interior of the skirt 21 at a point adjacent to the point 23 as shown at 26. Pivotaly secured to this lever at a point between its end and the pivot 26 is a link 27, whose opposite end is pivoted to the opposite side of the collar as shown at 28. The body of this link is preferably arranged outside of the collar so as to shield its pivotal points, the skirt 21 being suitably slotted for its passage as shown at 29, and the parts being so arranged that when the collar is constricted the lever 25 will lie inside this skirt as indicated in Figs. 6 and 7. The lever 25 is shown as provided with a slot 30 adapted when brought to closed position to register with a slot 31 formed in the skirt, so as to permit the passing therethrough of a sealing device 32. In the present embodiment the slot 31 is shown as formed in an ear 33 struck out from the skirt 21 so that the lever may be received between said ear and the skirt, thus forming a secure seat for the lever and increasing the difficulty of manipulating the lever without breaking the seal.

At the ends of the box the lower edge of the skirt 21 is rolled to form a false wire 35, forming a very convenient hand-hold for the manipulation of the box. At one side of the point 23 a guide rod 36 is secured in the cavity thus produced and projects into the cavity on the opposite side thus forming a guide. At the sides of the box the skirt 21 terminates in an inwardly projecting ledge 37, the width of this ledge and its distance from the face 20 being such as to permit it to receive and engage the rims 10—10 of the bottom member 1 when the box is knocked down for reshipment, there being provided between the bottom plate and the top plate in such case sufficient space to receive the remaining members of the box as illustrated in Fig. 7. At the inner edge the face 20 is preferably formed with a downturned flange 38 which serves to stiffen the collar and to support the weight of other boxes piled thereon, and also limits the opening movement of the collar member by engaging the shoulder 16.

Reference has heretofore been made to the fact that when the cover member is secured in place, the entire box is rigid. Before the application of this cover the side members are wholly disconnected. Accordingly for the purpose of temporarily holding these members in place during the filling of the box and the application of the cover we have illustrated a removable clamp or clip (see Fig. 1) comprising a pair of converg-

ing jaws 40—40 connected by a flexible elastic plate 41 and having operating handles 42—42, the jaws being preferably formed with forwardly projecting teeth 43 adapted to enter suitable apertures in the rims 7 and 8. Of course staples or rivets could be employed as in our copending application hereinbefore referred to, but these are unnecessary, the clips here suggested being amply sufficient to retain the side members in place, and their use rendering it very convenient for the box to be manipulated by one person.

While we have described our invention in detail and pointed out at length the construction and arrangements now preferred together with the reasons therefor, it will be understood that many changes could be made in minor points without sacrificing entirely the advantages contemplated; wherefore we do not confine ourselves to the details herein set forth except as the same may be specifically recited in the claims hereto annexed or may be rendered necessary by the prior state of the art.

Having thus described our invention, what we claim is:—

1. In a sheet metal box, the combination with sheet metal wall members having their edges formed for interengagement, of an independently rigid collar member adapted to embrace said edges and retain said wall members in engaging relation while assembled, said collar member being also arranged and adapted to receive and secure the various wall members when knocked down.

2. In a sheet metal box, the combination, with a bottom member, of a plurality of side members having opposite marginal portions similarly shaped, said bottom member being formed for interlocking engagement with certain marginal portions of said side members, the adjacent marginal portions of said side members being formed for direct interengagement, a cover member adapted to rest upon said side members and secure them together, and a collar member adapted to embrace the edges of the cover and sides and to clamp said cover member to said side members while assembled, said collar member being also arranged and adapted to receive and secure said bottom member, cover member, and side members when knocked down.

3. In a rectangular sheet metal box, the combination with a bottom member having inwardly opening undercut pockets, of a plurality of side members having outturned marginal rims adapted to be hooked into said pockets and seated simultaneously therein whereby a bracing effect is produced, and a cover member having marginal rims adapted to overlie the upper edges of said side members, together with means for se-

curing said cover member to said side members.

4. In a rectangular sheet metal box, the combination, with a bottom member
 5 having its marginal portions upturned to form inwardly opening undercut pockets, of a plurality of side members each of which has opposite margins similarly out-
 10 turned and adapted to be hooked into said pockets and seated simultaneously therein whereby a bracing effect is produced, said side members being reversible, a cover member having its marginal portions formed to
 15 embrace the margins of said side members, and means for securing said cover member to said side members.

5. In a rectangular sheet metal box, the combination, with a bottom member having its marginal portions upturned to form in-
 20 wardly opening undercut pockets, of a plurality of side members each of which has opposite margins similarly outturned and adapted to be hooked into said pockets and seated simultaneously therein whereby a
 25 bracing effect is produced, the remaining margins of said side members being formed for interengagement with the margins of adjacent side members, a collar member adapted to be constricted about said side
 30 members and having portions adapted to engage beneath the outturned margins of the same, said collar member also having an overhanging portion, and a cover member adapted to be gripped beneath said over-
 35 hanging portion.

6. The combination, with a knockdown metal box, of a contractible collar member adapted to surround the same and having portions adapted to overlie the box cover,
 40 the inner face of said collar member being formed at a point removed from said overlying portion with inwardly projecting members adapted to engage the box sides when the same is assembled and also to
 45 engage the box bottom when knocked down, the distance between said overlying portion and said inwardly projecting members being sufficient to permit all of the box parts to be packed therein.

50 7. The combination, with a knockdown box of a rectangular collar member adapted to surround the same, opposite sides of said collar member being severed and inter-
 55 mediate sides being formed with inwardly projecting portions, contracting devices operatively connected to the severed sides of said collar member and adapted to draw together the intermediate sides, the inwardly
 60 projecting portions of said collar member being arranged both to secure together the box members when assembled and to receive and retain those members when knocked down.

8. The combination, with a knockdown box of a rectangular collar member adapted

to surround the same, opposite sides of said collar member being severed and inter-
 mediate sides being formed with inwardly projecting portions, contracting devices
 70 operatively connected to the severed sides of said collar member and adapted to draw together the intermediate sides, and said inwardly projecting portions being ar-
 75 ranged to engage and secure together the cover and sides of the box, the edges of said collar member being rolled to form a hand hold.

9. A collar member for knockdown boxes, said member being of rectangular shape and having opposite sides severed, a lever
 80 pivoted to said member at one side of each point of severance, a link pivoted to each lever at a point between its free end and said first pivot, the opposite end of each link being pivoted to said collar at the other
 85 side of the corresponding point of severance, and engaging devices carried by the intermediate sides of said collar member and adapted to secure together the portions of the box with which they come in contact, the
 90 edges of said severed sides being rolled to form false wires, and guide rods secured in certain of the rolled portions and projecting into other of the same.

10. A collar member for knockdown
 95 boxes, said member being of rectangular shape and having opposite sides severed, a lever pivoted to said member at one side of each point of severance, a link pivoted to each lever at a point between its free end
 100 and said first pivot, the opposite end of each link being pivoted to said collar at the other side of the corresponding point of severance, and engaging devices carried by the intermediate sides of said collar member and
 105 adapted to secure together the portions of the box with which they come in contact and said severed ends being formed with seats for the reception of said levers when locked.

11. A collar member for knockdown boxes, said member being of rectangular shape and having opposite sides severed, a lever
 110 pivoted to the inner face of each of said severed sides adjacent to the point of severance, a link pivoted to the outer face of each of said sides beyond such point of severance, the opposite ends of said links being pivoted to the corresponding levers
 115 and the sides of said collar being slotted adjacent to said levers for the passage of said links, and engaging devices carried by the intermediate sides of said collar and adapted to secure together the portions of
 120 the box with which they come in contact.

12. The combination, with the face members of a rectangular box, of a collar member constructed and arranged to encircle
 125 said box when assembled or to receive and inclose said face members when disassem-

bled, and means for constricting and expanding said collar member.

collar member, and a hand hold carried by said collar member.

13. The combination, with the face members of a rectangular box, of a collar member constructed and arranged to encircle said box when assembled or to receive and inclose said face members when disassembled, means for constricting and expanding said

In testimony whereof, we hereunto affix our signatures.

HARALD KOREN.
DON A. CLARK.

Witness:

BRENNAN B. WEST.

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