Feb. 7, 1928. 1,658,529

C. D. KIMBALL

BOX AND METHOD OF MAKING SAME

Filed Aug. 17, 1921 2 Sheets-Sheet 1

Fig. 1.

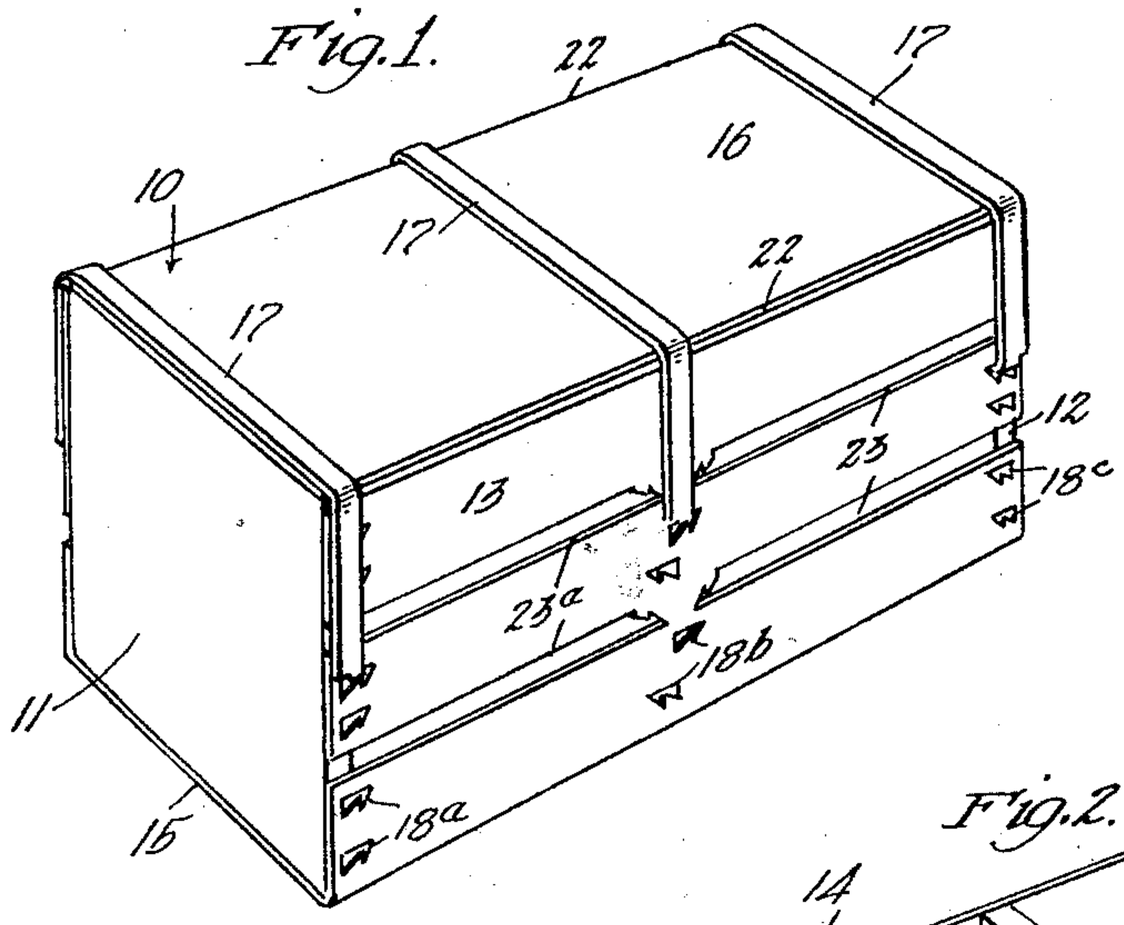


Fig. 4.

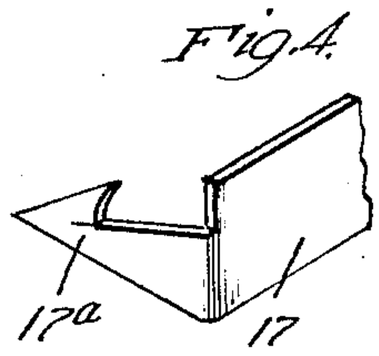


Fig. 2.

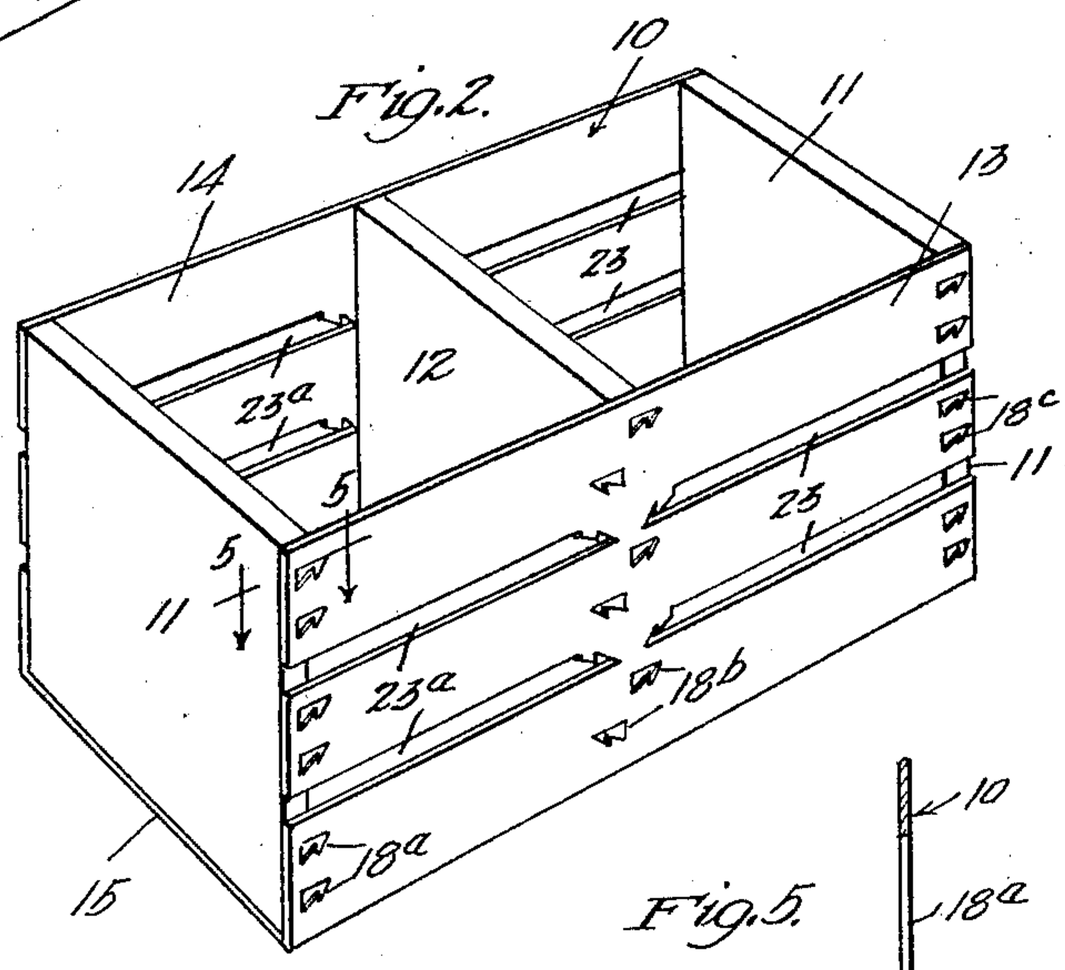


Fig. 3.

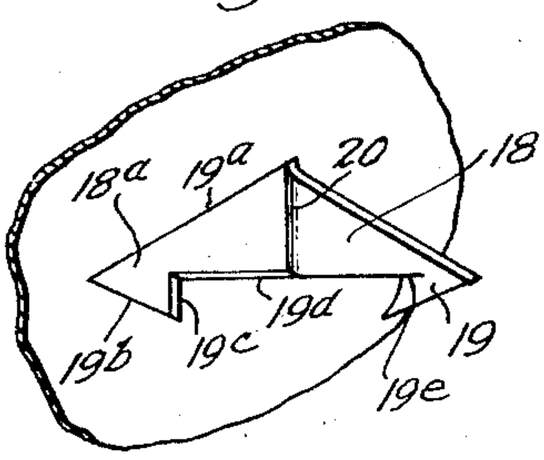


Fig. 5.

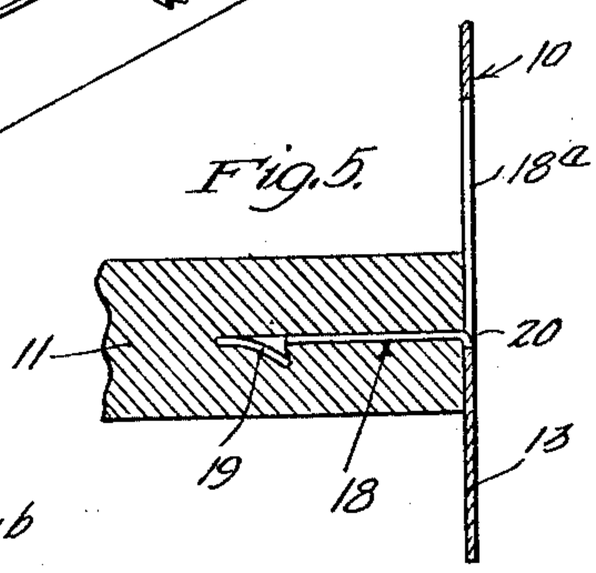
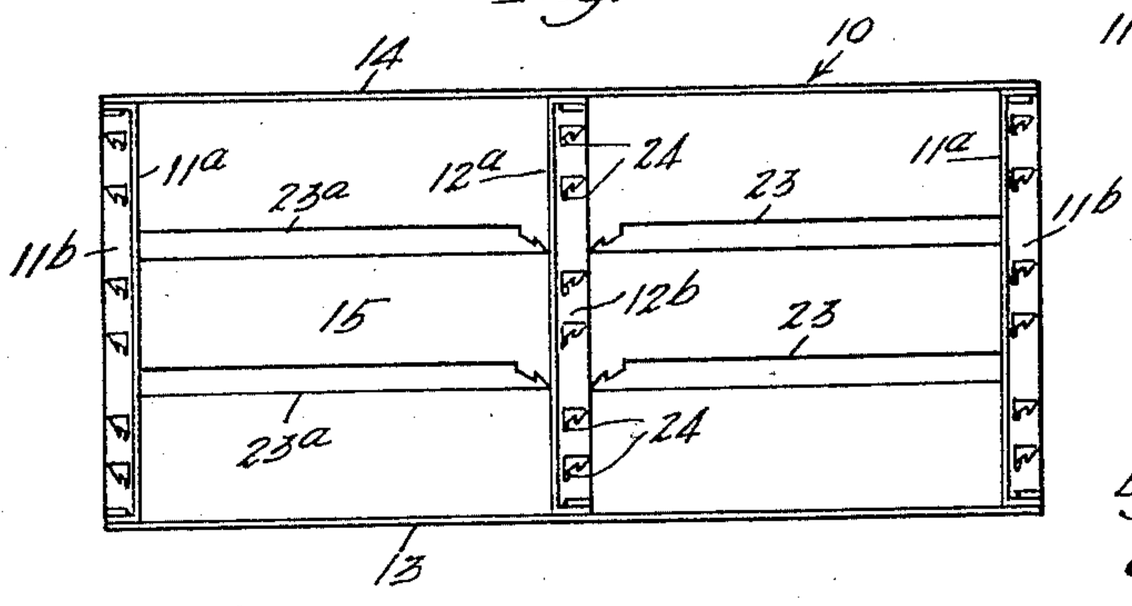


Fig. 6.



Inventor:
Charles D. Kimball
by James T. Burkeley.
his Attorney.

Feb. 7, 1928. 1,658,529

C. D. KIMBALL

BOX AND METHOD OF MAKING SAME

Filed Aug. 17, 1921 2 Sheets-Sheet 2

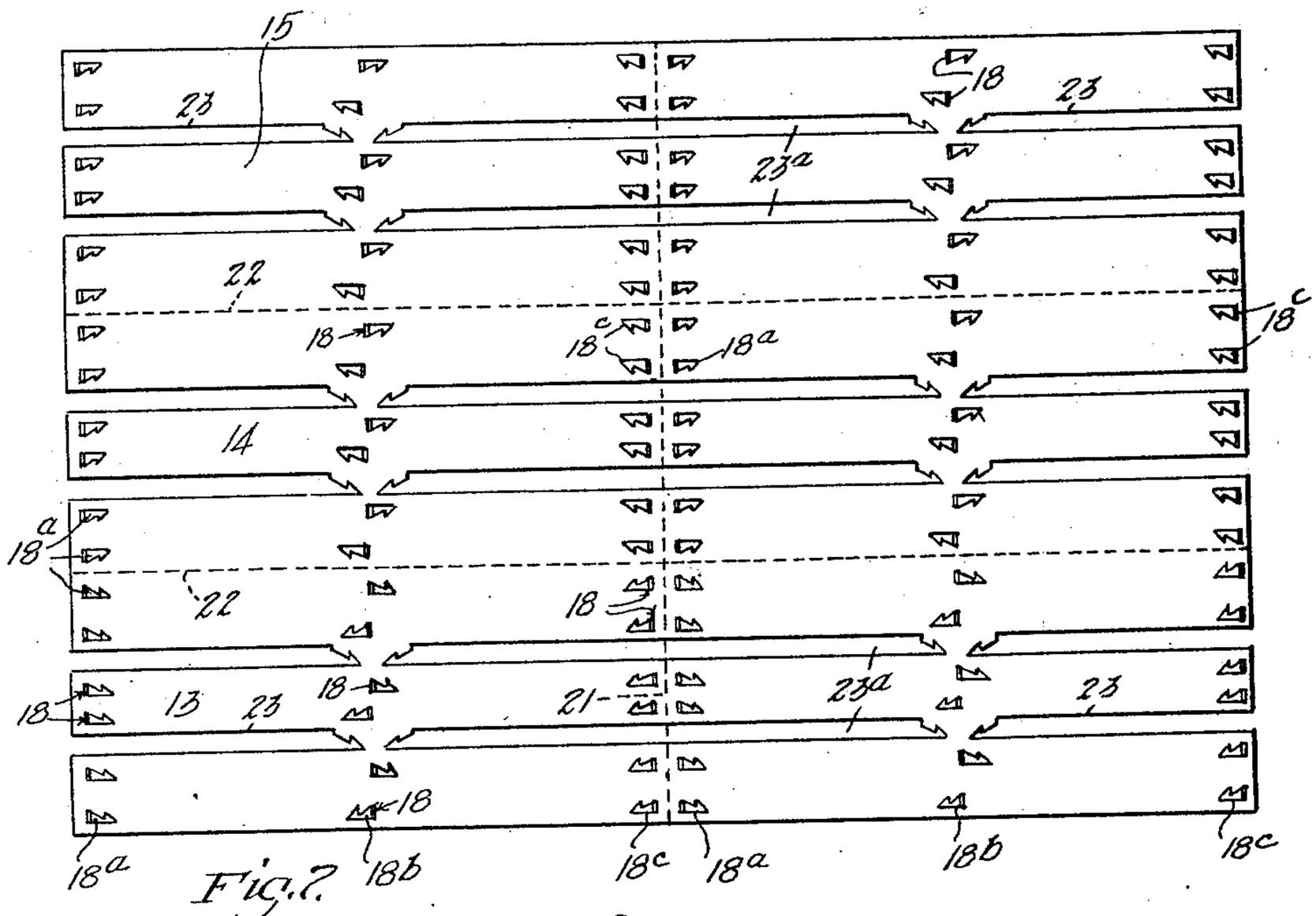


Fig. 7.

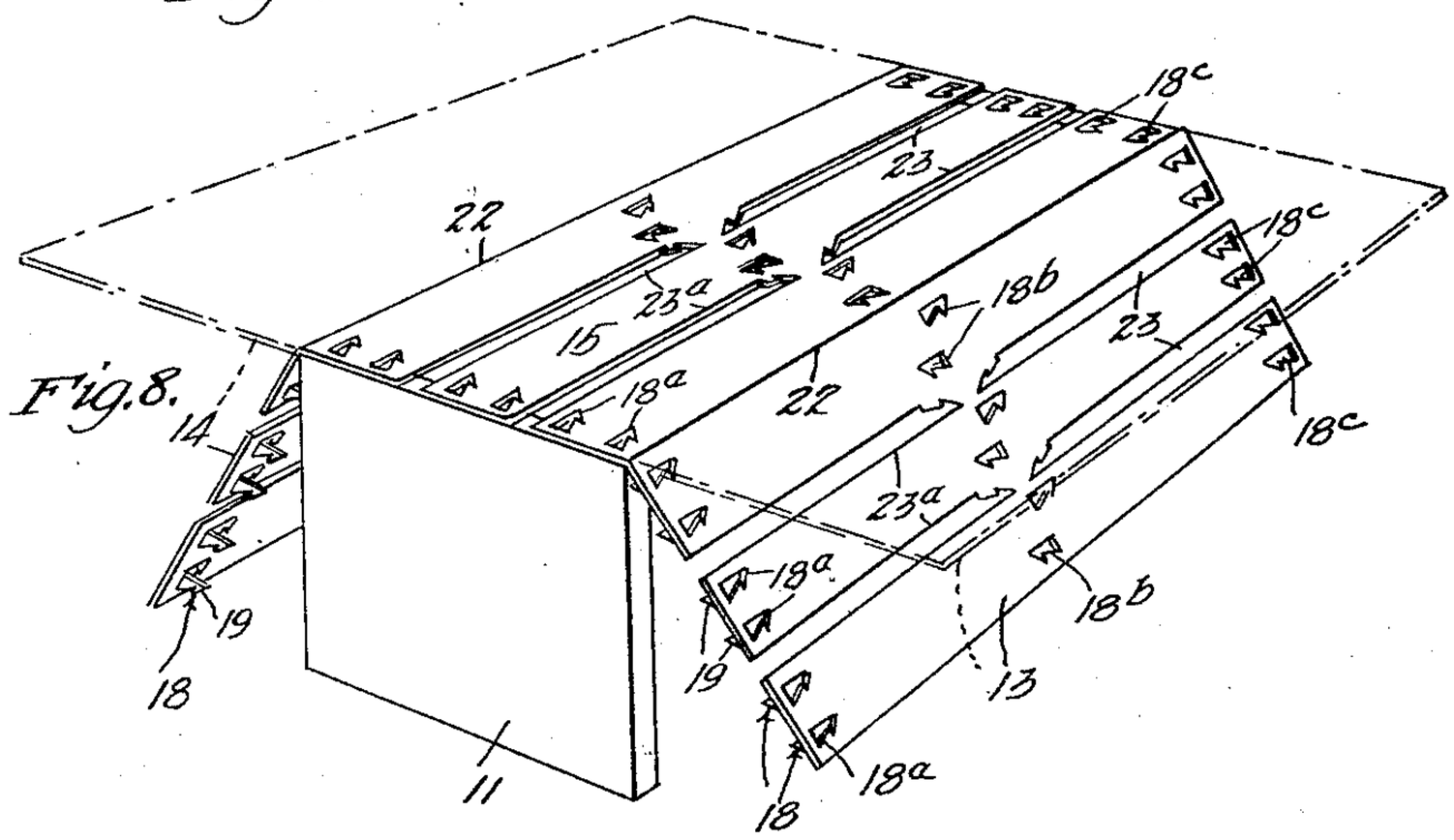
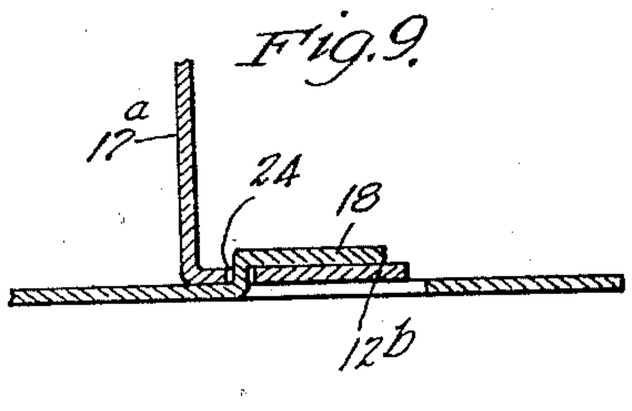


Fig. 8.

Fig. 9.



Inventor:
Charles D. Kimball.
by James T. Barkley.
his Attorney.

Patented Feb. 7, 1928. 1,658,529

UNITED STATES PATENT OFFICE.

CHARLES D. KIMBALL, OF LOS ANGELES, CALIFORNIA, ASSIGNOR OF ONE-HALF TO SAMUEL S. McKINNEY, OF LOS ANGELES, CALIFORNIA.

BOX AND METHOD OF MAKING SAME.

Application filed August 17, 1921. Serial No. 493,035.

Fundamentally, my invention pertains to boxes, and especially it relates to packing boxes of the type most commonly utilized in the packing of fruits and the like for shipment or storage, in which the sides or walls may be suitably apertured or slotted to permit the free circulation of air therethrough for cooling and preserving the contents.

Aside from the novel details of construction—which also are included within its scope—the invention is primarily characterized by the use of sheet metal or the combined use of sheet metal and wood in the construction of such boxes thereby conducing to the production of a box which is simple, durable, and inexpensive to manufacture and assemble; economy of production being the foremost object desired to be attained. Furthermore, this product is extremely efficient in use, owing to the susceptibility of the metal to quickly conduct changes in temperature, thereby enabling the box and its contents to be quickly, and consequently, inexpensively, cooled.

Other features of the invention will be more fully set forth in the following specification, reference being made therein to the accompanying drawings, wherein it is illustrated in its preferred specific form, and in which:

Fig. 1 is a perspective view of the assembled box; Fig. 2 is a view similar to Fig. 1 with the top removed; Fig. 3 is an enlarged fragmentary perspective view showing one of the securing tongues stamped from the sheet metal; Fig. 4 is a similar view showing one of such tongues formed on the end of a reinforcing strip; Fig. 5 is an enlarged fragmentary plan section taken as indicated by the line 5—5 of Fig. 2; Fig. 6 is a plan view of a modified form of construction; Fig. 7 is a plan view of a sheet metal blank from which the metallic portions of the box are formed; Fig. 8 is a perspective view showing the manner of assembling the several parts of the box; and Fig. 9 is a detailed sectional plan view showing the manner of assembling the construction shown in Fig. 6.

The following detailed description will be directed to an exposition of the principles of my invention, wherein my object of producing boxes economically is carried out by forming the bottom and sides thereof from a single sheet of metal, and stamping tongues from such sheets in position to be utilized as and instead of nails for securing the different parts together. Also the manner of assembling these parts in a single operation.

While this description will be directed to the construction of boxes of the type above mentioned; it should not be construed as a limitation to such types, as it may have a much broader application in the box making industry in the construction of boxes of various types.

Referring now to the drawings, and particularly to Figs. 1 and 2, the numeral 10 designates generally a box constructed in accordance with the principles of my invention, comprising end members 11 and a central division or partition 12, all rigidly secured in spaced relation by means of side members 13 and 14 and a bottom member 15. A top member 16 is adapted to be removably secured to the aforementioned structure by means of securing bands or straps 17, to the details of which I will later advert.

It may be here mentioned that the partition 12 may be omitted from the box without in any way impairing its structural stability or its efficiency in use. However, as such partitions are usually used in boxes of this character, the present disclosure will also be directed to the manner in which they may be incorporated in the structure.

The end members 11 and the central partition 12 are constructed of wood or similar material, while the side members 13 and 14 and the bottom 15 are constructed of sheet metal, the latter three members all preferably formed integral as will be more fully hereinafter explained. The top 16 is preferably constructed of wood, while the securing straps 17 will be formed of sheet metal, the same as the sides and bottom.

The ends 11 and partition 12 may be cut to form the box in any desired size, the usual thickness of about 5/8 of an inch being sufficient for the present purpose. In addition to the securing strips 17, the top 16 may be fastened to the ends 11 and partition 12 by nailing, as is now customary, in which case the strips 17 will merely serve as reinforcements.

The sides 13 and 14 and bottom 15 are secured to the ends 11 and partition 12 by

a plurality of small tongues 18 stamped out of and formed integral with these members in proper position and alignment to be driven or forced into the ends and partition as clearly shown in the drawings. The particular configuration of the tongues, together with the manner in which they are stamped out of the sheet metal portions, is shown in detail in Figs. 3, 5, 7 and 8. The tongues 18 may be of any suitable configuration, but preferably they are pointed and provided with a barb 19 at their pointed ends, which barb is designed to be bent over, as clearly shown in Figs. 5, 6 and 8, in order to securely engage the wooden end members and resist withdrawal therefrom. The tongues are formed by stamping them out of the sheet metal, cutting along the lines 19^a (see Fig. 3) to form a straight side, 19^b and 19^c to form the barb, and 19^d to complete the tongue, leaving it attached to the sheet along the end 20, so that it can be bent at right angles thereto (as shown in Fig. 5) for driving into the wooden end members and partition. The edges 19^b and 19^d are thus made diagonal and converge toward the straight edge 19^a to form a sharp or pointed tongue capable of being driven into the wooden members. The edge 19^c extending from the edge 19^b to 19^d forms the barb 19 designed to be bent over to one side to resist withdrawal of the tongues from the wooden members after being driven into them. This manner of forming the barb and bending it over slightly to one side, that is, forming it to extend generally in the plane of the tongue, tends to cause the barb to be straightened out or sprung co-planor with the body of the tongue when the latter is being driven or forced into the wooden members, and to bend to its normal position when force is applied to withdraw the tongue, thereby engaging the wood and resisting such withdrawal. The edge formed by the line 19^d may extend beyond the line 19^c as at 19^e (see Fig. 3) to further admit of the barb 19 bending sidewise or out of the plane of the tongue 18 to resist withdrawal from the wood.

Referring now to Fig. 7, a blank of sheet metal is shown which has been stamped to form the sides and bottom of the box, wherein the holes 18^a, 18^b and 18^c are formed in alignment and from which the tongues 18 have been stamped and bent to extend at right angles to the plane of the sheet. The holes 18^a and 18^c extend in a line adjacent to the ends of the member, and the holes 18^b extend in a line across the center thereof, from which the tongues are stamped and bent in position and alignment to be driven into the end members 11 and the partition 12, respectively. It will be noted that the holes 18^a and 18^c are stamped in position so the tongues may be bent to extend inwardly in alignment to engage the end members 11; all of them pointing inwardly with the ends 20 in alignment adjacent the ends of the member so the tongues 18 may be spaced as close as possible to the end edges; while the holes 18^b alternately point in opposite directions so the edges 20 will be formed in alignment and so the tongues may be bent to extend inwardly in a line to be driven into the partition 12.

For convenience and cheapness of manufacture I prefer to stamp the sides and bottoms for two or more boxes from a single sheet, as illustrated in Fig. 3, after which the sheet may be cut along lines as indicated by the dotted line 21, and thereafter the individual sections bent along the dotted lines 22 to form a U-shaped or a channel member for the reception of the wooden end members 11 and partition 12 as shown in the drawings. It is clear that any number of portions including the sides and bottom may be thus stamped out of a single sheet of metal. Also it will be apparent that by forming the sides and bottom integral the box structure will be greatly strengthened by the connection of the sides with the bottom along the lines 22.

In thus stamping out the sides and bottom for two or more boxes slots 23, for providing ventilation for the contents, may be stamped out of the blank as shown in Fig. 3, the central slots 23^a being stamped out to form the straps 17 with tongues 17^a—the same as tongues 18—formed integral with their ends, and bent over, as shown in Fig. 4 to be driven into the wooden portions as shown in Fig. 1. In this connection it may be stated that the holes 18^a, 18^b and 18^c from which the tongues 18 are stamped, preferably are so positioned that when the box is completed the straps 17 will be of such a length as to extend over the top of the box and the cover 16, the tongues 17^a on the ends thereof coming in position to extend through these openings and driven into the end members 11 and partition 12 as clearly shown in Fig. 1. For this reason the tongues 18 in the sides 13 and 14 preferably are stamped from the sheet metal so the straight lines 19^a will always be at the top of the openings 18^a, 18^b and 18^c when the box is completed, as shown in Fig. 2. In this connection attention is directed to Fig. 7 wherein the holes 18^a, 18^b, and 18^c are shown in reversed position on the sides 13 and 14.

The sides and bottoms may—if desired—be stamped from corrugated sheet metal, with the corrugations running longitudinally, to give added strength and rigidity to the box when completed.

Referring now to Figs. 6 and 9, I have shown a modified form in which ends 11^a and partition 12^a are constructed of sheet metal. Flanges 11^b and 12^b respectively, may be formed along the vertical sides and bottom edges of these members and along the

top side if desired—which abut against the sides 13 and 14 and the bottom 15. This flange is slotted as at 24, and the tongues 18 extended through them and then bent over against the flanges, as clearly shown in Fig. 9.

If desired the sides 13 and 14 and bottom 15 may merely have channels pressed or rolled into them along the lines of the central holes 18[b] and into which the partition 12 may be slipped, and held against movement longitudinal of the box. Any means may then be utilized to prevent removal of this partition when the cover 16 is removed.

From the foregoing description it is readily apparent that a box of the character described may be cheaply and easily constructed. The metal sides and bottom can be formed integral, from a single sheet of metal, and by a single mechanical operation as shown in Fig. 7 after which the wooden end members (and partitions if used) may be put in place and all secured together by forcing the tongues 18 into the edges thereof. It is further clear that—with the elements formed in accordance with the foregoing principles—a machine may be devised for securing the metallic portions to the wooden portions at a single operation. After the box has been thus formed, the top may be secured to the wooden members by sufficient nailing to prevent its endwise movement, and then finally secured in place to resist the outward pressure of the contents, by the strips 17.

In connection with the mechanical operation of assembling the sides and bottom on end members, attention is directed to Fig. 8, wherein the contemplated steps are partially illustrated. The sides and bottom blank may be stamped out, as shown in Fig. 7, and delivered ready for assembly in such form, or the sides may be bent along the lines 22 as shown in Fig. 8, to form the partial U-shaped structure. In either case the ends 11 (and partition 12 if used) may be held in place, and in proper spaced relation, by any suitable means, and the blank brought over these members as shown in said figure. The bottom 15 is first secured to the bottom edges of the end members, by forcing the tongues 18 thereinto, after which the side members are attached in the same manner. It is clear that these operations may be accomplished by hand or by a machine designed for the purpose; in any event the operations being performed expeditiously and at a minimum expense.

While I have herein shown and described a preferred specific embodiment of my invention, it is nevertheless to be understood that I reserve the right to make any changes and modifications in construction which properly come within the scope of the appended claim.

Having described a preferred form of my invention, I claim:

The method of forming a box of the character described, comprising the forming of the sides and bottom of a single piece of sheet metal by bending it U-shaped, forming securing tongues integral with said sides and bottom by stamping them out and bending them to extend at substantially right angles to the planes of said members, securing wooden end members in said U-shaped portion by forcing said tongues into their edges, stamping ventilating slots in said sides and bottom, forming barbed tongues on the ends of the strips stamped out to form said slots, and using said strips to extend over the top and be driven into the edges of said end members to hold the top on.

In witness that I claim the foregoing I have hereunto subscribed my name this 12th day of August, 1921.

CHARLES D. KIMBALL.