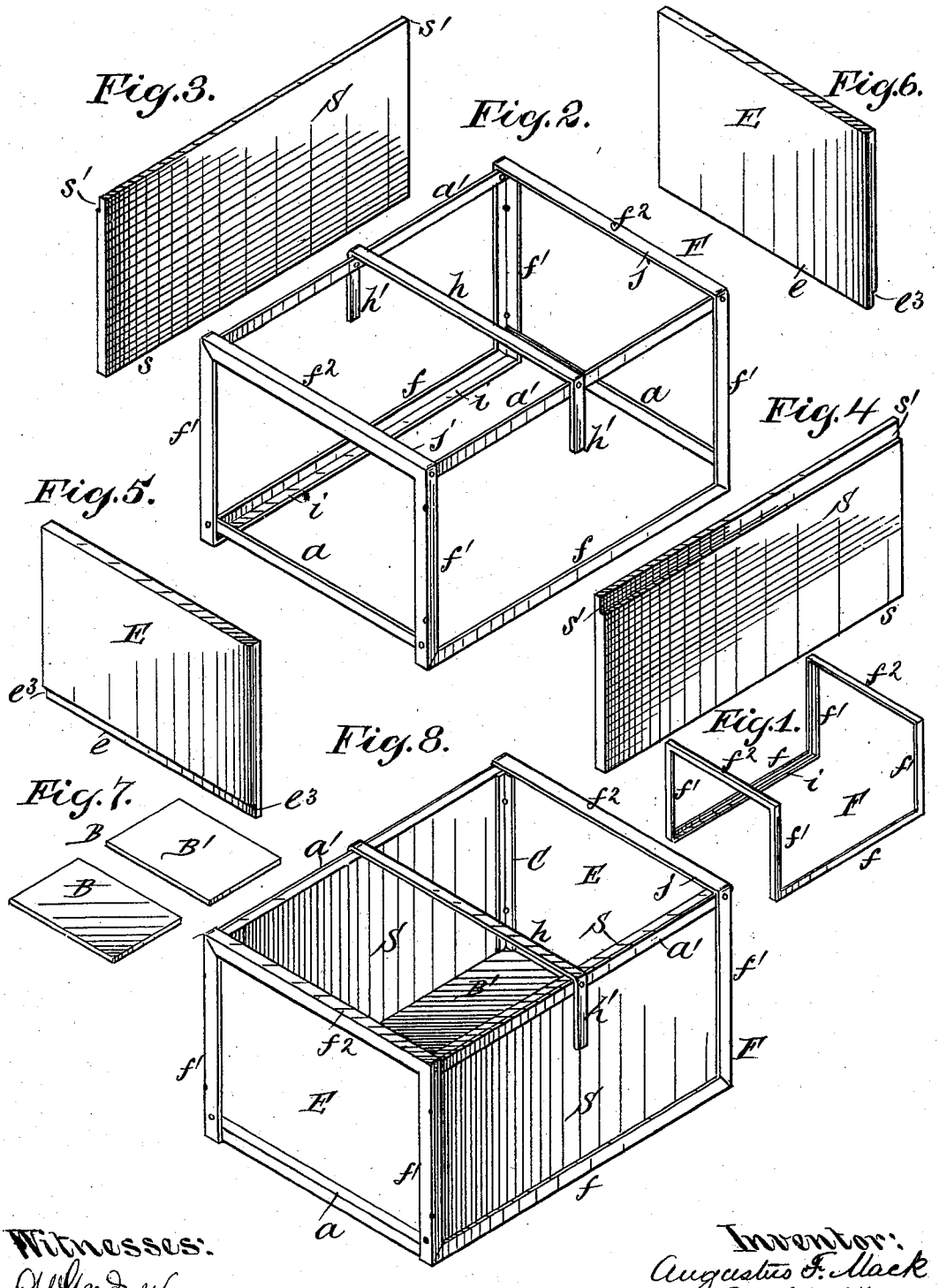
No. 695,618. Patented Mar. 18, 1902.

# A. F. MACK.

## BOX.

(Application filed Aug. 26, 1901.)

(No Model.) 2 Sheets—Sheet 1.




Witnesses:
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John Kirn

Inventor:
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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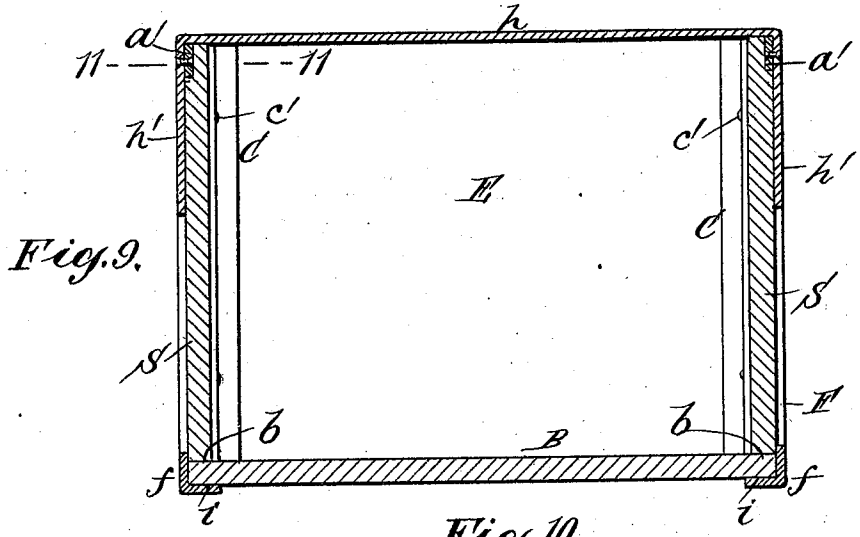



Fig. 9.

Fig. 10.

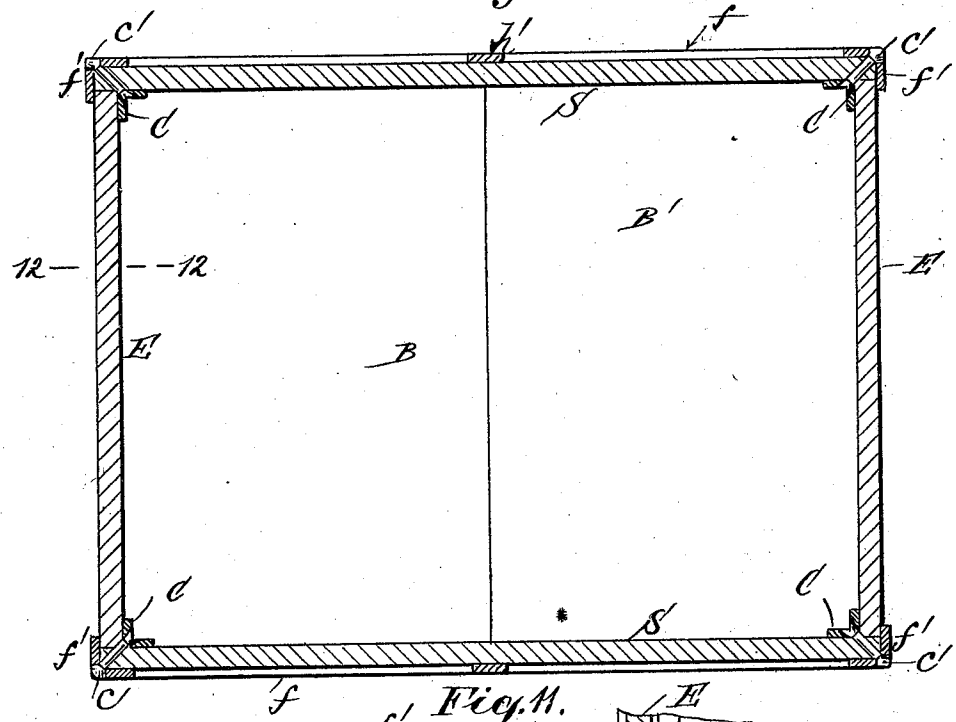



Fig. 11.

Fig. 12.

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# UNITED STATES PATENT OFFICE.

AUGUSTUS F. MACK, OF BROOKLYN, NEW YORK.

## BOX.

SPECIFICATION forming part of Letters Patent No. 695,618, dated March 18, 1902.

Application filed August 26, 1901. Serial No. 73,275. (No model.)

*To all whom it may concern:*

Be it known that I, AUGUSTUS F. MACK, a citizen of the United States, residing in the city of New York, borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Boxes, of which the following is a specification sufficient to enable others skilled in the art to which the invention appertains to make and use the same.

My improvements relate to boxes in which metallic frames are used to support and reinforce the bottom, side, and end boards, and are designed to be applied more particularly to boxes for the transportation of milk and other bottles where the boxes are subjected to rough handling and soon wear out under ordinary conditions of use.

The distinguishing feature of my invention consists in a basic skeleton or frame made from a single continuous piece of metallic angle-bar bent to form parallel upper cross members, corner-posts, and floor members, the ends of this metallic angle-bar being rigidly united to constitute a one-piece frame, into which the bottom, side, and end boards fit, substantially as hereinafter set forth; and the invention consists in the construction and arrangement of parts hereinafter described and claimed specifically.

In the accompanying drawings, Figure 1 is an isometrical view of my rectangular skeleton box-frame in its simplest form; Fig. 2, an isometrical view of the same upon a larger scale, showing the addition of braces. Figs. 3 and 4 are respectively isometrical views of the side pieces of the box, showing the inner and outer surfaces thereof; Figs. 5 and 6, similar views of the end pieces of the box. Fig. 7 is a view, on a smaller scale, of a plain box-bottom made in two pieces. Fig. 8 is an isometrical view of the box with all the parts assembled. Fig. 9 is a transverse vertical section of the box, upon an enlarged scale, upon a plane passing through the handle-brace; Fig. 10, a horizontal section of the same; Fig. 11, a horizontal sectional detail of a corner of the box upon plane of line 11 11, Fig. 9; Fig. 12, a vertical sectional detail upon plane of line 12 12, Fig. 10.

My invention involves as a fundamental structure the rectangular frame F, made of angle-iron or other metallic bars or rods substantially rectangular in cross-section, the concave surfaces facing inward, so as to constitute horizontal and vertical flanges for the reception, support, and protection of the edges of the bottom, sides, and ends of the box. The frame F is made of a single bar or rod of angle-iron or other metal cut and bent into the rectangular form shown, the ends of the bar being welded together, so as to create a continuous integral structure consisting of the floor members $f\,f$, the corner-posts $f'\,f'$, and the end cross-bars $f^2\,f^2$, as shown in Fig. 1, in which form the frame may be used for the reception and support of the bottom section B or sections B B', the edges of which it will fully protect, while strengthening and reinforcing the box as a whole. I prefer, however, in order to prevent the possibility of the spreading apart of the parallel members of the frame, as might possibly happen under undue strain, to use braces $a$ and $a'$, the opposite ends of which are rigidly secured, preferably by rivets, to opposed members of the frame. Thus in the drawings the end braces $a\,a$ are shown as secured to and extending between the lower portions of the opposed flanges of the corner-posts $f'\,f'$, while the side braces $a'\,a'$ are secured to and extend between the opposed flanges of the corner-posts at opposite ends of the frame, with the result that the end braces $a\,a$ preserve the alinement of parallelism of the floor members $f\,f$, while in like manner the side braces insure the alinement of the upper cross-bars $f^2\,f^2$. In this connection it is obvious that a like result may be attained, for instance, by securing the braces $a\,a$ directly to the parallel floor members $f\,f$ and the braces $a'\,a'$ to the end bars $f^2\,f^2$, so that I do not confine myself strictly to the identical structure shown, since various modifications and mechanical expedients may be resorted to without departing from the spirit and intent of my invention.

The bottom B is preferably made in two or more sections B B' to facilitate placing in position, which is done by resting the ends upon the inwardly-projecting horizontal flanges $i\,i$ of the floor members $f\,f$. The side pieces S S are then placed in position with their lower edges $s$ resting upon the edges $b\,b$ of the floor,

their upper edges at the corners $s'$ $s'$ being pressed under the horizontal flanges $j$ $j$ of the upper cross-bars $f^2$. The end pieces are next placed in position with their lower edges $e$ $e$ resting against the bottom, their vertical edges against the inner surfaces of the side pieces, and their upper edges under the flanges $j$ $j$ of the end cross-bars $f^2$ $f^2$. It will thus be seen that the parts lock each other successively in position, it being only necessary to secure the end pieces E E against movement in order to insure the stability of the structure as a whole. This I accomplish, preferably, by means of corner-brackets C C, resting against the inner surfaces of the end pieces E E and side pieces S S at their point of intersection, as will be understood by reference to the last four figures of the drawings. These corner-brackets are preferably made of angle-iron, but may be made of wood or any other material in any desired form in cross-section, the essential feature being the use of strips or binders which may be secured rigidly to the frame F for the purpose of positively locking the sides S S and ends E E against movement. A simple and effective way of effecting this result is to rivet the corner-brackets C to the corner-posts $f'$ $f'$, as shown in Fig. 10, in which $c'$ represents the rivets. Any other mechanical expedient may be resorted to in securing the corner-brackets rigidly to the frame F.

The bottom, side, and end pieces are made of wood or any other desired material. When made of wood of sufficient thickness, I rabbet the upper edges of the side pieces, as at $s'$, and the lower edges of the end pieces, as at $e^3$, to receive and overlap the braces $a'$ and $a$, respectively.

The frame, &c., may be used either with or without the handle-brace $h$, shown as riveted centrally to the side braces and as formed with extensions $h'$ $h'$, which project downward in front of the side pieces S S.

By my improved construction the bottom particularly of the box, as well as its ends and sides, is secured firmly and rigidly in position against displacement, whereas in the case of boxes at present in use for the purposes indicated the bottom is the weakest part of the box and frequently collapses, spilling the contents of the box. It will be seen also that the edges of the floor, sides, and ends are completely isolated and protected by the flanges constituting the angle-bars of metal, the frame F bearing the brunt of all strain and contact. Furthermore, in this connection it will be noted that the upper surfaces of the cross-bars $f^2$ $f^2$ (and of the handle-brace $h$ when used) constitute raised bearings upon which the bottom of another box may be safely placed without subjecting the sides, ends, or bottom sections of the box to additional weight or strain.

When for any reason it is desired to substitute or replace the whole or a portion of the bottom or a side or end piece, this may be easily accomplished by removing the corner-brackets temporarily, so that part may be removed from time to time and the life of the box as a whole prolonged indefinitely.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. As an article of manufacture a skeleton for boxes consisting of a continuous piece of metallic angle-bar bent to form upper cross members, corner-posts, and floor members, the ends of the said angle-bar being rigidly united to form a one-piece frame, together with metallic braces extending between and riveted to opposed parallel members of said continuous one-piece frame, substantially as set forth.

2. A skeleton frame for boxes consisting of a continuous piece of metallic angle-bar bent to form upper cross members, corner-posts, and floor members, the ends of the said angle-bar being rigidly united to form a one-piece frame, together with metallic braces extending between and riveted to opposed parallel members of said continuous one-piece frame, in combination with bottom, side, and end boards fitting in said rectangular metallic frame, and means for locking the said bottom, side, and end boards in position substantially as set forth.

3. A metallic skeleton for boxes consisting of upper cross-bars, corner-posts and floor members formed of flanged bars substantially rectangular in cross-section, said rectangular bars being united integrally to form one continuous piece, in combination with braces extending between and riveted to opposite parallel members of the frame, and with the transverse brace secured to the upper side braces and constituting a handle for the frame substantially as set forth.

4. A frame for boxes consisting of the skeleton F, constructed by bending a single continuous piece of metallic angle-bar to form the upper cross-bars $f^2$, $f^2$, corner-posts $f'$, $f'$, and floor members $f$, $f$, the ends of the said piece of angle-bar being welded to constitute a one-piece frame, and braces $a$, $a$, $a'$, $a'$, secured to and between the corner-posts $f'$, $f'$, for the purpose and substantially in the manner set forth.

5. In a box, the combination of the skeleton frame consisting of a continuous piece of metallic angle-bar bent to form upper cross members, corner-posts, and floor members, the ends of said angle-bar being rigidly united to form a one-piece frame, metallic braces rigidly secured to and between the corner-posts of said frame, floor-boards fitting into and between the said floor members, side boards fitting over the edges of the floor-boards and into the corner-posts, and end boards fitting over the floor-boards and between the side boards and under the cross members of the frame, substantially in the manner and for the purpose described.

6. In a box, the combination of the skeleton frame consisting of a continuous piece of metallic angle-bar bent to form upper cross mem-

bers, corner-posts, and floor members, the ends of said angle-bar being rigidly united to form a one-piece frame, metallic braces rigidly secured to and between the corner-posts of said frame, floor-boards fitting into and between the rectangular floor members, side boards fitting over the edges of the floor-boards and into the corner-posts, end boards fitting over the floor-boards and between the side boards, and under the cross members of the frame, and angle-brackets fitting into the corners formed by the junction of the side and end boards, said angle-brackets being secured rigidly to said metallic frame, substantially as and for the purpose set forth.

7. A metallic skeleton for boxes consisting of the frame F, formed of the upper cross-bars $f^2$, $f^2$, corner-posts $f'$, $f'$, and floor members $f$, $f$, all made of L-bars substantially rectangular in cross-section and united integrally, the braces $a$, $a$, $a'$, $a'$, secured to and between the corner-posts $f'$, $f'$, and the transverse handle $h$, secured to the upper braces $a'$, $a'$, for the purpose described.

8. The combination with the metallic skeleton consisting of the rectangular frame of L-bars constituting the floor members, corner-posts and upper cross-bars, and of the braces rigidly secured to and between the said corner-posts, of the floor fitting into the said rectangular floor members, the side pieces fitting over the floor and into the corner-posts and formed with the rabbeted upper edges to receive the side braces of the frame and the end pieces fitting over the floor between the side pieces and under the end cross-bars and formed with the rabbeting lower edges for the reception of the end braces of the frame, substantially as described.

9. The combination with the metallic skeleton consisting of the rectangular frame of L-bars constituting the floor members, corner-posts and upper cross-bars, and of the braces rigidly secured to and between the said corner-posts, of the floor fitting into the said rectangular floor members, the side pieces fitting over the floor and into the corner-posts and formed with the rabbeted upper edges to receive the side braces of the frame, the end pieces fitting over the floor between the side pieces and under the end cross-bars and formed with the rabbeting lower edges for the reception of the end braces of the frame, and the angle-brackets fitting into the corners formed by the junction of the side and end pieces and secured rigidly to the metallic frame for the purpose set forth.

10. In a box the combination with the frame F, formed of L-bars constituting the floor members $f$, $f$, the corner-posts $f'$, $f'$, and the end bars $f^2$, $f^2$, all formed in one integral piece and of the braces $a$, $a$, $a'$, $a'$, rigidly riveted to the end posts $f'$, $f'$, of the floor-pieces B, B', the side pieces S, S, the end pieces E, E, and the angle-brackets C, C, fitting in the corners of the box and riveted to the corner-posts $f'$, $f'$, substantially as set forth.

11. In a box the combination of the frame E, formed of L-bars constituting the floor members $f$, $f$, the corner-posts $f'$, $f'$, and the end bars $f^2$, $f^2$, all formed in an integral piece, and of the braces $a$, $a'$, $a$, $a'$, riveted to the end posts $f'$, $f'$, with the floor-pieces B, B', the side pieces S, S, formed with the rabbeted edges $s$, $s$, the end pieces E, E, formed with the rabbeted edges $e^3$, $e^3$, and the angle-brackets C, C, riveted to the corner-posts $f'$, $f'$, as set forth.

12. The combination in a box of the rectangular frame F, formed of L-bars constituting the floor members $f$, $f$, the corner-posts $f'$, $f'$, and end bars $f^2$, $f^2$, and of the braces $a$, $a'$, $a$, $a'$, and transverse handle-brace $h$, with the floor-pieces B, B', the side pieces S, S, the end pieces E, E, and the corner angle-brackets C, C, riveted to the corner-posts $f'$, $f'$, the whole arranged substantially as and for the purpose herein set forth.

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Witnesses:
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