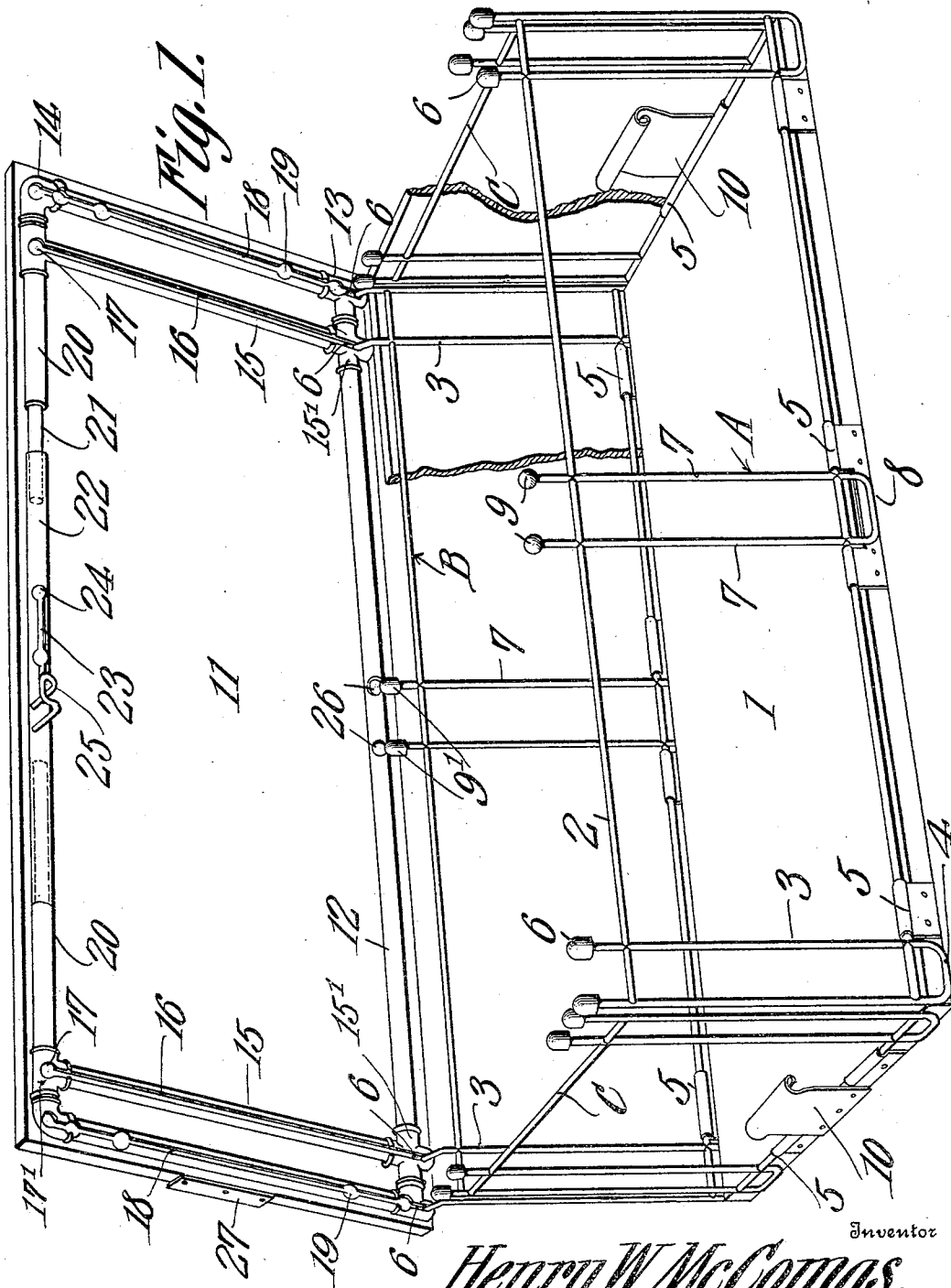


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 COLLAPSIBLE CRATE.
 APPLICATION FILED MAR. 10, 1908.

931,954.

Patented Aug. 24, 1909.

2 SHEETS—SHEET 1.



Inventor

Henry W. McComas.

By

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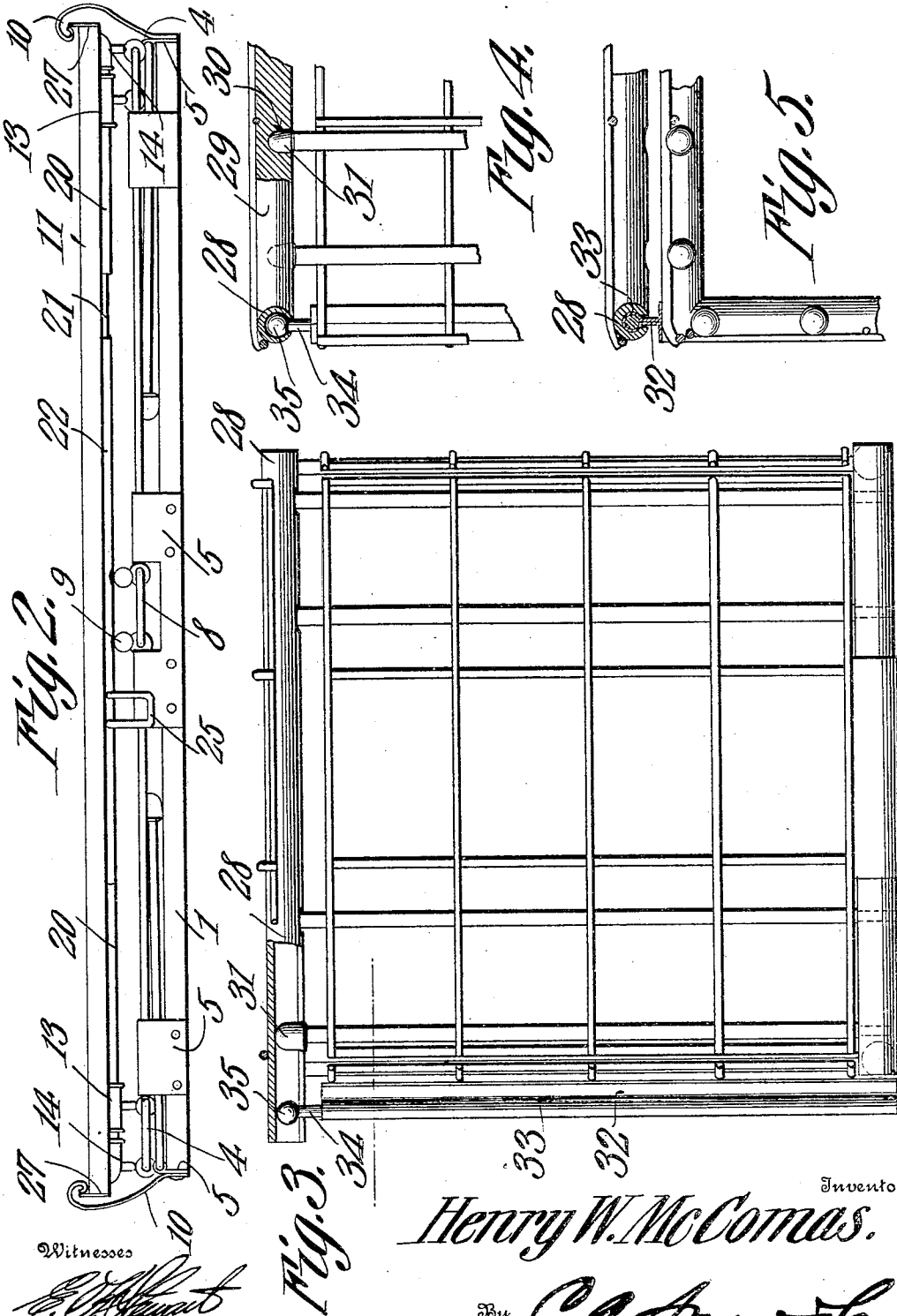
Witnesses

E. J. McComas
 Herbert D. Lawson

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UNITED STATES PATENT OFFICE.

HENRY WHEELER McCOMAS, OF OAKLAND, MARYLAND.

COLLAPSIBLE CRATE.

931,954.

Specification of Letters Patent. Patented Aug. 24, 1909.

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To all whom it may concern:

Be it known that I, HENRY W. McCOMAS, a citizen of the United States, residing at Oakland, in the county of Garrett and State of Maryland, have invented a new and useful Collapsible Crate, of which the following is a specification.

This invention relates to collapsible crates and its object is to provide a device of this character made up of a plurality of movably connected panels designed to be folded together so as to produce a relatively small bundle or package when not in use.

A further object is to provide a crate the top of which is both slidably and pivotally connected to one of the walls of the crate so as to be shiftable into position upon said wall and permit the compact folding of the crate.

Another object is to provide novel means for fastening the top panel to the walls of the crate, said means consisting of ball and socket connections.

A still further object is to provide simple and efficient means for locking the top panel in position when the crate is set up.

With these and other objects in view the invention consists of certain novel features of construction and combinations of parts which will be hereinafter more fully described and pointed out in the claims.

In the accompanying drawings is shown the preferred form of the invention.

In said drawings: Figure 1 is a perspective view of a crate embodying the present improvements, only the frames of the walls of the crate being illustrated for the sake of clearness. Fig. 2 is a side elevation of the crate folded. Fig. 3 is an end elevation of a modified form of crate. Fig. 4 is a view partly in section and partly in elevation of one end portion of the front of the modified form of crate. Fig. 5 is a view partly in plan and partly in section of one corner of the modified form of crate and showing the cover positioned back and parallel with the rear wall of the crate.

Referring to the figures by characters of reference, 1 designates the bottom panel of a crate which may be of any preferred construction and has front, rear, and end panels hingedly connected to it and designed to fold thereupon. These panels may be constructed of any suitable material such as sheet metal, wood, or metal fabric. In Fig. 1 each panel has been shown provided with a rec-

tangular frame 2 formed of rods or stiff wires, the ends of each panel being provided with parallel connecting rods 3 formed in pairs, the rods of each pair being preferably constructed in a single length of metal bent into U-shape and having its middle or crown portion 4 extended below the lower longitudinal wire of the frame. This longitudinal wire is mounted to rock or partly rotate within plates 5 fastened to one edge of the bottom panel. Each of the rods 3 has a substantially semi-spherical centering head 6 at its upper end and supported beyond the upper wire 2 of the panel. As heretofore stated four of these panels are provided, and the front and rear panels have been designated by the letters A and B, respectively, while the end panels have been designated by the letter C.

The foregoing description applies equally to all of the panels, it being of course understood that the front and rear panels may be either longer or shorter than the end panels. In addition to the structure set forth each of the panels A and B has parallel rods 7 connected to the top and bottom rods 2 adjacent the center of the panel, the rods 7 of each panel being formed in a single, length of metal folded so that its loop or crown portion 8 extends below the lower wire 2 of the panel. Spherical heads 9 are formed at the upper ends of the rods 7 on panel A and the rods 7 on panel B have their upper portions provided with heads 9' which are substantially semi-spherical instead of spherical. As shown in Fig. 1 the hinge plates 5 upon the various sides or edge of the panel 1 are of different heights so that the four panels constituting the walls of the crate can be folded onto the bottom panel, as indicated in Fig. 2. Spring clips 10 are secured to the ends of the bottom panel and are designed to be used as hereinafter stated.

In the foregoing description of the various panels only the structure of the frames has been set forth. It is to be understood, of course, that these frames may be covered with wire fabric, sheet metal, wood or any other materials.

The cover provided for this crate consists of a panel 11, of any suitable material, and to the bottom surface of which is secured a preferably rectangular frame which may be formed of small pipes or tubes connected at the rear corners of the frame by T-fittings 13, and at the front corners of the frame by

elbows 14. Tubes 15 are arranged within the side portions of this frame and are connected at their rear ends to the rear tube 12 of the frame by means of cross fittings 15', while the front ends of these tubes 15 are attached to the front tubes 20 of the frame by means of T-fittings 17'. The tubes 15 are slotted longitudinally as indicated at 16, said slots continuing into the cross-fittings 15' and terminating therein, while the front ends of the slots extend into the T-fittings 17' and are enlarged, as indicated at 17. The end tubes of the frame are also slotted longitudinally as indicated at 18, these slots extending into the T-fittings 13 and the elbows 14, there being enlargements or eyes 19 formed at intervals within the slots 18 and spaced apart at such distances as to receive the heads 6 of the end panels C when the closure is lowered on to said panels. The front tubes 20, heretofore referred to, extend toward each other from the elbows 14 and T-fittings 17', and are disposed in alinement, each of the tubes 20 having a stem 21 secured in it and projecting there-beyond. A tubular locking member 22 is interposed between the tubes 20 and is slidably mounted on the stems 21, the length of this locking member being slightly less than the distance between the tubes 20, so as to permit a limited longitudinal movement of the locking tube 22 upon the stems 21. A slot 23 is formed longitudinally within the locking member 22 and has enlargements or eyes 24 designed, when in a predetermined position, to receive the heads 9 of the front panel A. A looped handle 25 may be extended from the member 22 to facilitate the movement thereof upon the stems 21, and this member may be utilized for the purpose of fastening the cover 11 in closed position after the crate has been set up and as will be hereinafter set forth. Apertures or eyes 26 are formed in the rear tubular member 12 of the frame for the reception of the heads 9' of the panel B.

When it is desired to fold or collapse the crate the top panel or cover 11 is swung upwardly so as to disengage the tubes of its frame from the heads 6, 9 and 9' of the panels A, B and C. The panels C are then folded down on to the bottom of the crate, after which the front panel A is folded on to the end panels. Before folding the panel B onto the folded panels A and C, it is necessary to bring the top panel 11 into position above the panel B. The heads 6 on the rods 3 of panel B constitute pivots for the panel 11 during this movement of said panel, and, by referring to the drawings, it will be seen that the upper ends of these rods 3 are bent backwardly from the panel B, so that when the top panel has been swung upwardly it can be brought into a position in a plane parallel with but extending back of the panel

B. As soon as the top panel has been brought into this elevated position it can be slid downwardly on the rearwardly bent portions of the rods 3 until it assumes a position directly back of the panel B, whereupon the two panels B and 11 can be folded on to the panels C and A, as indicated in Fig. 2. Plates 27 are secured to the ends of the panel 11 and will be automatically engaged by the spring clips 10 as soon as the crate has been folded, as above described, and, therefore, the parts of the crate will be thus securely held in folded position.

To set up the crate, the spring clips 10 are first disengaged from the plates 27, after which the panels B and 11 are swung into position perpendicular to the panel 1. Panels A and C are then successively swung upwardly into position perpendicular to the bottom panel 1, this swinging movement of the panels being limited by the intermediate portions 4 and 8. The top panel 11 is then slid upwardly upon the backwardly bent portions of the rods 3 until the heads 6 upon the rods assume positions within the T-fittings 13 and the cross fittings 15'. The top panel 11 is then swung downwardly on to the upstanding panels A and B, and the heads 6, 9 and 9', will enter the corresponding eyes or enlargements formed within the different tubes of the frame on the panel 11. The tubular locking member 22 can then be shifted longitudinally upon the stems 21 by means of the handle 25, this movement of the member 22 being sufficient to shift the apertures or eyes 24 from under the heads 9, so as to prevent the said heads from being withdrawn from the tubular member. The top panel 11 will thus be securely fastened in closed position and in engagement with the heads on the various panels. While the top panel is in this position the handle 25 may be fastened to the front panel A in any suitable manner, as by passing a padlock therethrough and around one of the rods of said panel A.

Importance is attached to the fact that balls and sockets are utilized for connecting the parts of the crate because they serve to quickly center the parts. Moreover, by utilizing heads such as shown at 6 they will fit snugly within the various enlargements 17 and 19 and hold the parts rigidly together after the panel 1 has been secured in place.

Instead of forming the top panel with a tubular frame such as heretofore described said panel can be provided with longitudinally slotted tubular members 28 along the ends thereof, while the front and rear members 29 of the top panel can be solid and provided with sockets 30 to receive the heads 31 which correspond with the heads 6 and 9 of the crate shown in Fig. 1. Moreover, instead of utilizing rearwardly extending rods upon the back panel of the crate, said

rods carrying balls as indicated in Fig. 1, said back panel can be provided along each end with a rail 32 having a substantially cylindrical head 33. Two of these rails may
5 be provided and each has a stem 34 at its upper end provided with a spherical head 35 designed to project into one of the tubular members 28. When it is desired to position this top panel upon the back panel of the crate said top panel is swung upwardly until in alinement with the back panel whereupon it is slid downward on the rails 32 as indicated in Fig. 5.

It is to be understood of course that various other modifications may be made in the construction and arrangement of parts without departing from the spirit or sacrificing the advantages of the invention.

What is claimed is:

20 1. A crate comprising a bottom panel, wall panels hingedly connected thereto, a top panel, and ball and socket connections of fixed proportions arranged between the top panel and the wall panels.

25 2. A crate comprising a bottom panel, wall panels movably connected thereto and disposed to fold thereon, ball members carried by said wall panels, and a top panel slidably and hingedly connected to one of the wall panels, and having sockets for detachably holding and centering the top panel upon the wall panels.

30 3. A crate comprising a bottom panel, wall panels foldable thereon, a top panel, and ball and socket means for centering the top panel upon the wall panels certain of said means constituting means for slidably and pivotally connecting the top panel to one of the wall panels.

40 4. A crate comprising a bottom panel, wall panels foldable thereon, a top panel slidably and hingedly mounted upon one of the wall panels, balls carried by one of the wall panels, and a ball receiving tubular
45 locking member movably mounted upon the top panel.

5. The combination with a crate comprising a plurality of connected panels; of a top panel slidably and hingedly connected to one of the wall panels, a tubular locking
50 member slidably mounted on the top panel and longitudinally slotted, said slot having an enlargement, and a head upon one of the panels for engagement with the enlarged portion of the slot, said tubular member
55 being shiftable upon the head.

6. A crate comprising bottom and wall panels foldable together, a head supported by each of the wall panels, a top panel slidably and pivotally mounted upon certain of
60 the heads, and means carried by the top panels for receiving said heads to center the top panel.

7. A crate comprising bottom and wall panels foldable together, spherical heads
65 carried by one of the panels, a top panel slidably and pivotally mounted upon the heads, centering heads carried by the panels, said top panel having sockets for the reception of the centering heads, locking heads
70 upon one of the wall panels, and tubular locking means slidably mounted upon the top panels for engagement with the locking heads.

8. A crate comprising bottom and wall
75 panels foldable together, a ball supported by one of the wall panels, a top panel, a slotted frame upon the top panel and slidably and pivotally mounted upon the ball, a relatively movable tubular member included in said
80 frame and slotted longitudinally, and a locking head carried by one of the wall panels for engagement with the movable tubular member, the slot in said member being enlarged for the reception of said head.
85

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

HENRY WHEELER McCOMAS.

Witnesses:

G. B. FRALEY,
S. S. JONES.