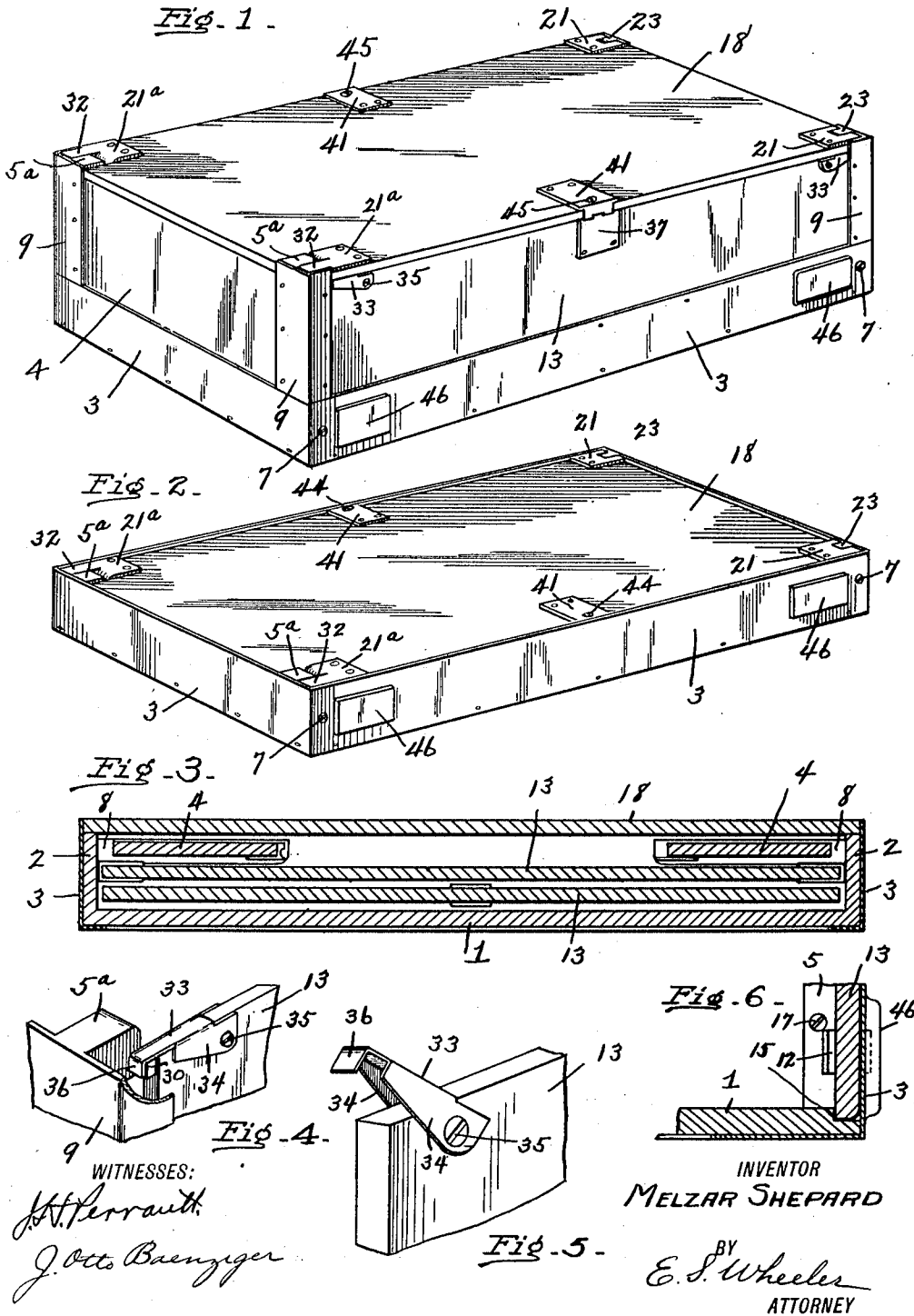


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FOLDABLE SHIPPING CRATE.  
APPLICATION FILED MAR. 25, 1912.

1,039,452.

Patented Sept. 24, 1912.

3 SHEETS—SHEET 1.



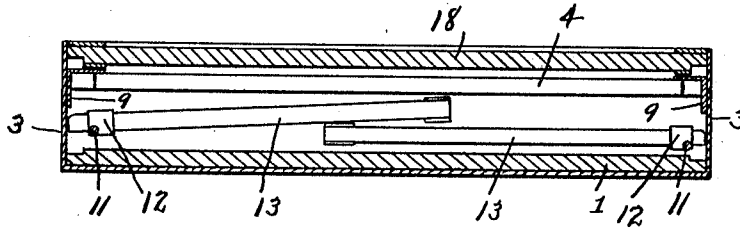
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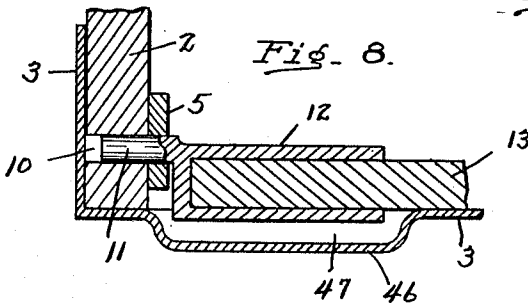
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3 SHEETS—SHEET 2.

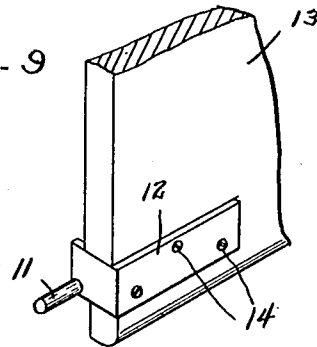
*Fig. 7.*



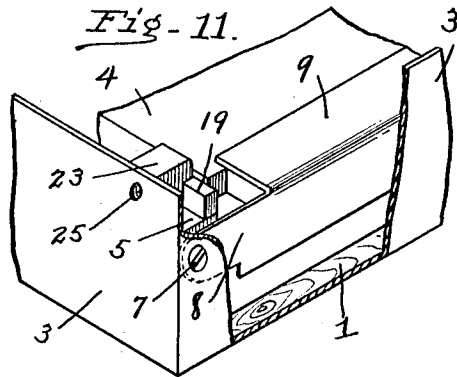
*Fig. 8.*



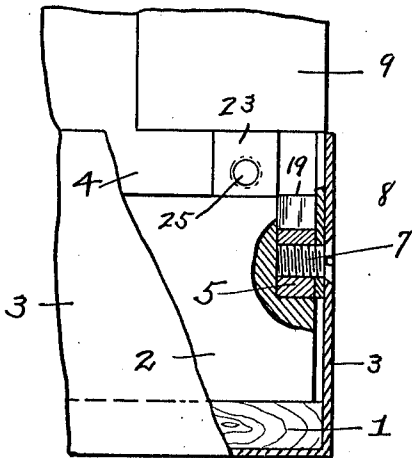
*Fig. 9.*



*Fig. 11.*



*Fig. 10.*



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INVENTOR

*MELZAR SHEPARD.*

BY

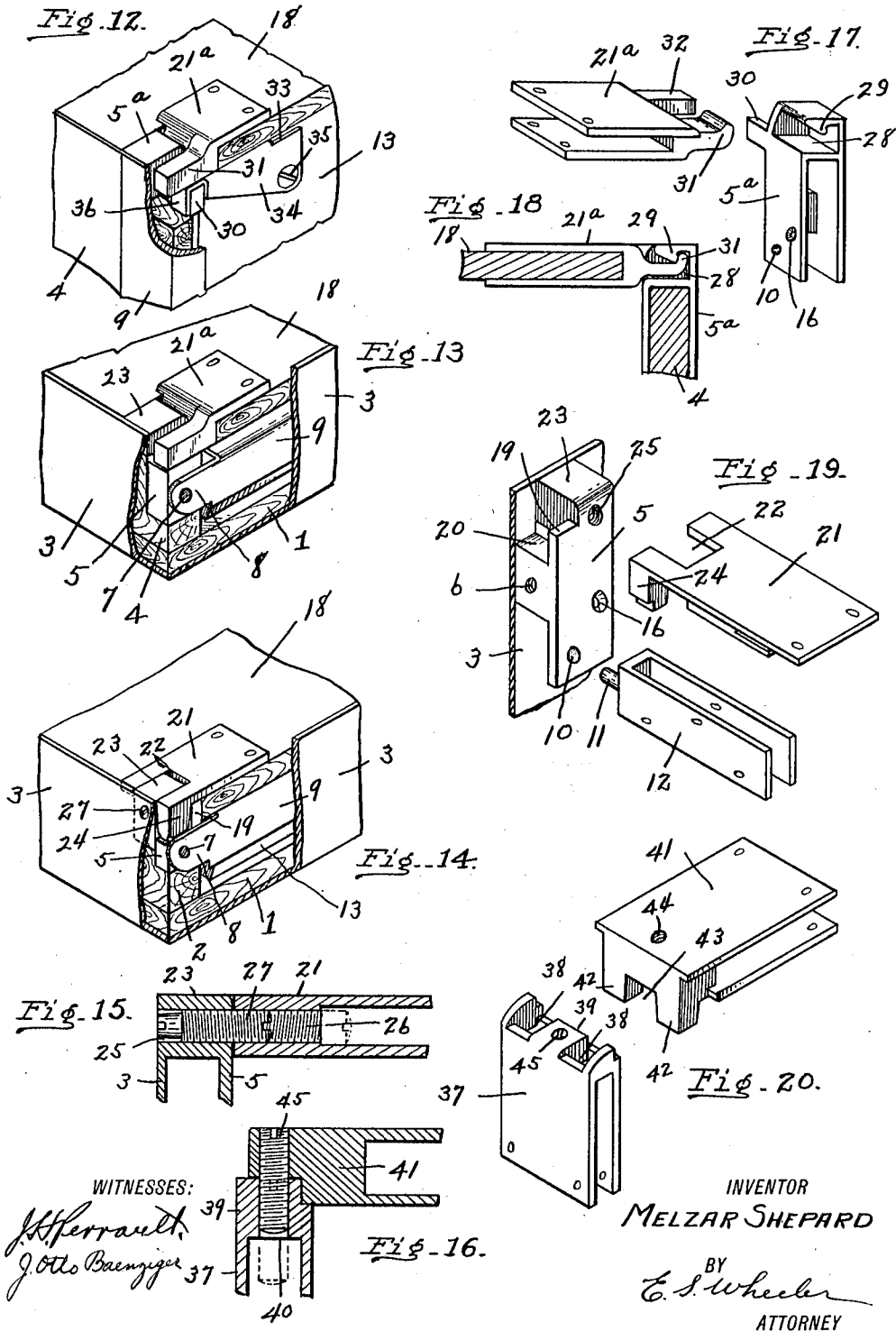
*E. S. Wheeler*  
ATTORNEY

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3 SHEETS—SHEET 3.



# UNITED STATES PATENT OFFICE.

MELZAR SHEPARD, OF HOLLY, MICHIGAN.

FOLDABLE SHIPPING-CRATE.

1,039,452.

Specification of Letters Patent.

Patented Sept. 24, 1912.

Application filed March 25, 1912. Serial No. 685,960.

*To all whom it may concern:*

Be it known that I, MELZAR SHEPARD, a citizen of the United States, residing at Holly, in the county of Oakland, State of Michigan, have invented certain new and useful Improvements in Foldable Shipping-Crates; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to foldable shipping crates, and consists in the construction and arrangement of parts hereinafter more fully set forth and pointed out particularly in the claims.

The object of the invention is to provide a crate of the character described, wherein provision is made for folding the parts of the crate into a comparatively small compass, so that said crate will occupy but a small space and may be returned to the point of shipment at small cost, enabling the same crate to be repeatedly used for the shipment of merchandise. The invention contemplates such an arrangement and coöperative association of parts as will enable the foldable members of the crate to be readily folded and rigidly secured for return shipment, and the crate to be quickly and easily restored to its full capacity for the reception of merchandise, provision being made for rendering the parts strong and durable.

The above object is attained by the construction illustrated in the accompanying drawings, in which:—

Figure 1 is a perspective view of a crate made in accordance with my invention as in condition for use. Fig. 2 is a perspective view of the crate folded for return shipment. Fig. 3 is an enlarged longitudinal section through the crate folded. Fig. 4 is a fragmentary view in section, showing the method of locking the foldable side pieces and end pieces at the corner. Fig. 5 is a fragmentary view in perspective, showing one of the pivoted locking dogs carried at the corner of the foldable side pieces. Fig. 6 is a fragmentary view in section, showing a portion of the bottom and the lower portion of the wall of one of the foldable side pieces. Fig. 7 is an en-

larged transverse section through the crate folded. Fig. 8 is a fragmentary view in horizontal section through a corner of the crate, showing the method of hinging the foldable sides to the stationary portions of the ends. Fig. 9 is a fragmentary view in perspective, showing one of the hinge elements at the end of one of the foldable sides. Fig. 10 is a fragmentary view, partly in section, of one corner of the crate, showing the method of effecting a hinge between the stationary and foldable end portions. Fig. 11 is a fragmentary view in perspective of the parts shown in Fig. 10 in the folded position. Fig. 12 is a fragmentary view in perspective of one corner of the crate, said crate being in condition for the shipment of merchandise therein and the cover being secured in place. Fig. 13 is a similar view, showing the parts folded and the manner of securing the cover in position thereon at one end. Fig. 14 is a similar view, showing the manner of securing the cover at the opposite end upon the folded parts. Fig. 15 is a view of the fittings at one corner of the crate with the parts folded, showing the manner of securing the top or cover in place. Fig. 16 is a fragmentary view in section through the fittings employed at the margin of the top and the upper edge of one of the sides, showing the manner of detachably securing said fittings together to hold the top in place, and lock the upper edge of the side to the top fitting. Fig. 17 is a view in perspective of the corner pieces disassembled, said pieces being employed to secure one corner of the top to the upper edge of the foldable end. Fig. 18 is a fragmentary view in section through the parts shown in Fig. 17 in operative association. Fig. 19 is a view of some of the associated parts, comprising a fitting at one corner of the fixed portion at the end of the box in which the fitting, which carries the end of the side, is journaled, and illustrating the fitting carried at one corner of the top which coöperates with the fitting on the stationary part of the end, to lock said parts together when the crate is folded. Fig. 20 is a view in perspective of the fittings shown in section in Fig. 16, which are carried by the upper edge of the foldable side and at one margin of the top, respectively, and which coöperate to secure said parts together.

The physical embodiment of the inven-

tion, as illustrated in the accompanying drawings, comprises a bottom 1, short rigid end portions 2 mounted on said bottom, and a metallic base strip 3, L-shaped in cross-section, which embraces the rigid end portions 2 and forms the rigid base portions of the sides, the flanged lower margin of said strip which extends onto the under face of the bottom, serving as a metal guard, which protects the lower edges of the crate and firmly binds together the rigid base members thereof. The height of the metal base strip 3 is such that when the crate is folded, its members are all confined within the area described thereby.

To the rigid end portions 2 of the crate are hinged the foldable end portions 4 in the following manner: Rigidly secured to the metal base strip 3 at the corners at one end of the crate and also to the ends of the rigid end portion 2, are the fittings 5, shown more clearly in Fig. 19, and at the other end of the crate are secured in like manner the fittings 5<sup>a</sup>, shown more clearly in Fig. 17. In the outer face of each of said base fittings is a tapped aperture 6, adapted to receive a screw bolt 7 which passes through the metal base strip 3 and through the lower end of an arm 8, which extends downwardly from the angle iron corner post 9 and lies between the faces of the fittings 5 and 5<sup>a</sup> and said metal base strip, effecting a pivotal connection between said corner post and said fittings. It will be understood that there is a corner post 9 at each of the corners of the crate and that there is a pair of said posts for each of the foldable end portions 4, to which said end portions are permanently secured in any suitable manner. By hinging the foldable end portions 4 in the manner described, they may be folded inwardly when it is desired to fold or collapse the crate, and when raised will swing into vertical alignment with the rigid portions 2 of the ends to complete the end portions of the crate, as shown generally in Fig. 1 and in detail in Fig. 10. In each of the base corner fittings is a smoothly drilled aperture 10, adapted to receive a pintle 11 (see Fig. 19) projecting from the end of a metallic yoke 12, which embraces the lower edge of the foldable side pieces 13 at the corners, said yokes being secured to said side pieces by transverse screws or bolts 14, as clearly shown in Fig. 9. By this arrangement the side members 13 may be folded inwardly onto each other, as shown in Figs. 3 and 7, the points of pivot of said side pieces being disposed below that of the pivoted end pieces, so as to enable said end pieces to fold onto the side pieces as shown. It will be noted that the pintle 11 of the hinge of the foldable sides 13 is offset from the longitudinal axis of the hinge member, an ar-

range ment which causes the lower edges of the hinged sides to swing upwardly and away from the bottom 1 in the operation of folding, and which also enables a vertical shoulder 15 (see Fig. 6) to be provided in the upper face of the bottom at the margin thereof, behind which the lower edge of the foldable side 13 engages when swung to a vertical position, thereby strengthening the hinged sides at the bottom to enable them to resist inward pressure at that point. Again referring to Figs. 17 and 19, it will be seen that the fittings 5 and 5<sup>a</sup> are each provided with an aperture 16. This aperture is adapted to receive a fastening screw 17, shown in Fig. 6, adapted to enter a portion of the rigid end portions 2 to assist in attaching said fittings to said end portions.

The base strip 3 in conjunction with the bottom 1 forms a comparatively shallow metallic tray or receptacle, within which the foldable parts of the crate are contained when folded. In order to form a complete housing for the folded parts and to retain them securely in place when folded, provision is made for securing the cover 18 of the crate upon said folded parts, and within the upper portion of the metallic base strip 3 in the following manner: The fittings 5 are each provided with a shoulder 19 at the inner edge thereof near the top and with a recess 20 in the rear of said shoulder. Secured to the corners of the top or cover 18 at one end thereof are the metal fittings 21, each of which has a recess 22 in the end thereof to receive the solid upper portion 23 of the fittings 5, and with a depending lug 24 at the outer corner, adapted to engage over the shoulder 19 and lie in the recess 20 of said fittings 5. Formed transversely through the solid upper portion 23 of each fitting 5 is a tapped aperture 25, shown more clearly in Fig. 19. Extending through the solid portion of the fitting 21 is a tapped aperture 26 (see Fig. 15), in which is adapted to lie a screw 27. When the cover is in position upon the folded members of the crate, as shown in Fig. 14, the tapped apertures 25 in the fittings 5 and the tapped apertures 26 in the fittings 21 will register, enabling an instrument or tool to be inserted through the apertures 25 in the fittings 5 to engage the screws 27 and back said screws outwardly into the apertures 25, as clearly shown in Fig. 15, whereby the fittings 5 and 21 are securely fastened together and the cover 18 is rigidly secured to the rigid end portions 2 of the crate at one end thereof. To rigidly attach the opposite end of the cover to the opposite end portion 2, the fittings 5<sup>a</sup> are employed, which differ from the fittings 5 in that each is provided in its upper end with a recess 28, into which depends a shoulder 29 and with a laterally

projecting lug 30 extending outwardly from one face of said fitting, as clearly shown in Fig. 17. Coöperating with the fittings 5<sup>a</sup> are the fittings 21<sup>a</sup> which are mounted on the opposite corners of the cover from the fittings 21, and differ from said last mentioned fittings in that each is provided with a forwardly projecting hook-like member 31, adapted to enter the recess 28 and to engage in the rear of the shoulder 29 therein, the opposite end of the cover being raised to permit the hook to pass said shoulder, so that when the cover falls to a horizontal position, the hook will lie in the rear of the shoulder and automatically lock the parts together, as clearly shown in Fig. 18. Projecting forwardly from each of the fittings 21<sup>a</sup>, and slightly above the plane of the hook 21 is a finger 32, which lies upon the lug 30 when said parts, 5<sup>a</sup> and 21<sup>a</sup>, are in engagement. By thus automatically locking the cover to the fittings 5<sup>a</sup> at one end and securing the opposite end of the cover to the fittings 5, through the medium of the screws 27, said cover may be rigidly locked to the rigid base portion of the crate over the folded sides and ends lying therein, as clearly shown in Figs. 13 and 14.

Explanation has been made of the manner of securing the cover over the folded members of the crate when the crate is collapsed. I will now proceed to describe the manner in which the foldable sides and ends of the crate are locked together at the corner when the crate is open, and also the manner of firmly securing the top to the foldable ends and sides in that position.

One of the hinged end pieces 4 at its upper corners is provided with a set of fittings 5<sup>a</sup>, as shown in Fig. 12, and the other hinged end piece at its upper corners with a set of the fittings 5. By this arrangement, when the crate is open or unfolded, the top may be readily secured in place to retain the contents therein in the same manner as already described in securing it in place over the folded members of the crate, the same fittings being used and the same operations being employed in securing the cover thereto. To firmly join the hinged sides 13 to the hinged ends 4 at the corners when the foldable members of the crate are unfolded, each of the hinged sides at its upper corners is provided with the pivoted dogs 33, which are provided with the parallel side members 34 that embrace the hinged side members 13, as clearly shown in Fig. 5, and through which the pivoting screws 36 pass to attach said dogs to said side pieces. When the hinged ends and sides are raised to a vertical position, the dogs 33 may be swung downwardly, so as to cause their hooked terminals 36 to engage over the shoulders 19 of the fittings 5 and the later-ally projecting lugs 30 of the fittings 5<sup>a</sup>,

as clearly shown in Fig. 12, thereby firmly tying the hinged end and side members together at the corners, so that when the cover is secured in place, as before described, a crate of great rigidity and strength is formed, notwithstanding its collapsible character. To serve as an additional means for fastening the cover to the foldable sides of the crate when the crate is open or unfolded, each of the foldable side members is provided at its upper edge with a fitting 37, which is adapted to embrace the upper edge of the side, and in the top of each of which are formed sockets 38. Between said sockets, each of said fittings 37 is provided with a solid central portion 39, having a tapped aperture 40 extending vertically therethrough. Coöperating with the fittings 37 on the upper edges of the sides are the fittings 41, secured to the margins of the cover on opposite sides thereof. Each of the fittings 41 is provided with depending lugs 42, which are adapted to enter the sockets 38 in the corresponding fitting 37, the solid central portion 39 of the fitting 37 lying in the opening 43 between said lugs 42. Passing vertically through the fitting 41 is a tapped aperture 44 in vertical alinement with the aperture 40 in the solid portion 39 of the fitting 37. Normally seated in the threaded aperture 40 in the fitting 37 is a screw 45, which, when the fittings 37 and 41 have been placed together as described, may, by the introduction of a tool through the opening 44, be unscrewed or backed out of the aperture 40, so as to extend into and engage the threads in the aperture 44, as clearly shown in Fig. 16, whereby the fittings 37 and 41 are rigidly fastened together, thus firmly securing the hinged sides and the top at the central portions thereof.

When it is desired to remove the cover, the screws 45 are screwed through the fittings 40 into the fittings 37, as shown by dotted lines in Fig. 16, thereby disconnecting said fittings and releasing the cover at the central portion thereof. The ends of the cover are released by screwing the screws 27 through the fittings 5 into the fittings 21, as shown by dotted lines in Fig. 15, thereby releasing the fittings which hold the cover at one end; whereby, by raising the disengaged end of the cover, the opposite end, secured by the engagement of the hooks 31 of the fittings 21<sup>a</sup> with the shoulders 29 of the fittings 5<sup>a</sup> may be also disengaged to enable the cover to be entirely removed from the crate. The operation of removing the cover is the same whether it be attached to the upper edges of the foldable members when the crate is filled with merchandise, or whether it be attached to the fittings mounted on the ends of the fixed end pieces 2, when the crate is folded, with the exception that when the cover is secured in place

over the folded side and end pieces, there is no provision made for securing the cover at the center thereof, as in the case where the crate is open and filled with merchandise.

When the top is in position upon the crate, and the foldable sides and ends thereof are extended, the end portions of the cover lie upon the dogs 33, and prevent them from accidentally rising out of engagement with the corner fittings of the crate.

The metal base strip 3, near the corners on the sides, has a portion 46 struck up therefrom to form a recess 47, the purpose of which is to allow the fitting 12 to rotate without causing the corner thereof to strike the inner face of the strip 3 when the sides are swung upon their pivots 11.

When the hinged end and side pieces are folded within the metallic base portion thereof and confined therein by the cover 18, as shown in Fig. 3, the crate is reduced to a stanch and small package, which may be cheaply and conveniently returned to the point of shipment, the arrangement being such that when desired for use the crate may be readily set up, and its foldable members securely locked in place.

Having thus fully set forth my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A foldable crate comprising a bottom, a rigid base portion, fittings secured within the base portion at the corners, foldable end and side members hinged to said fittings to fold inwardly within the rigid base portion, a cover having fittings at its corners adapted to cooperate with said fittings at the corners of the base portion to effect a locking engagement between the fittings of the base portion and of the cover, to retain the cover in place in the base portion over the folded members therein, and screws detachably coupling the fittings of the base portion and the fittings of the cover at one end of the crate.

2. A crate comprising a bottom, a fixed base portion, fittings at the corners of the fixed base portion to which the foldable sides and ends are hinged, a cover having fittings at the corners thereof, said cover fittings at one end of the cover having engageable members adapted to effect a locking engagement with the corner fittings of the base portion to which the end and side pieces are hinged, the cover fittings at the other end of the cover cooperating with the corner base fittings at the opposite end of the crate to effect a locking engagement between said parts, and screws in the last mentioned base fittings adapted to be drawn into engagement with the corner fittings of the cover to rigidly connect said parts.

3. A foldable crate comprising a bottom, a fixed base portion forming a tray, end and

side members hinged to fold within said tray, fittings in the fixed base portion at one end having recesses with depending shoulders, a cover having at one end a fitting provided with hooked members adapted to enter the recesses in the base fittings and engage said shoulders to lock said parts together, and engageable members at the opposite end of the cover and at the opposite end of the base portion cooperating to detachably secure the end of the cover to the base portion over the foldable members therein.

4. A foldable crate comprising a bottom, a fixed base portion, a fitting at each corner of the base portion, foldable end members pivoted to said corner fittings, foldable side members pivoted to said corner fittings, and a cover having engageable members at its corners adapted to detachably engage the corner fittings of the base.

5. A foldable crate comprising a bottom, a fixed base portion, a fitting at each corner of the base portion, foldable end members pivoted to said corner fittings, foldable side members pivoted to said corner fittings, said corner fittings having engageable members for the cover, a cover having corner fittings and said corner fittings of the cover having engageable members which cooperate with said engageable members of the corner fittings of the base to detachably lock the cover thereto.

6. A foldable crate comprising a bottom, a fixed base portion rising from the bottom and forming a quadrangular tray, end and side members hinged to the fixed base portion to fold within said tray, said hinged end members having fittings at their upper corners, said hinged side members having hooks at their upper corners adapted to engage the corner fittings of said end members, and a cover having corner fittings which cooperate with the corner fittings of the hinged end members to detachably lock the cover in position on the crate.

7. A foldable crate comprising a base, hinged side and end members, a fitting at the corner of one hinged member, a pivoted hook at the corner of the other hinged member adapted to detachably engage said fitting, and a cover adapted to lie upon said hooks and hold them in engagement with the fittings of the hinged members, said cover having corner fittings which detachably engage the fittings of the hinged members to retain the cover in place upon the crate.

8. A foldable crate comprising a bottom, hinged side and end members, a fitting at the corner of one of said members having an engageable shoulder, a pivoted hook at the corner of the other of said members adapted to engage said shoulder, said fitting having engageable members for retaining the cover in place, and a cover having a fitting

lying upon said hook and engaged by the members of the fitting on the hinged member to lock the cover in place.

5 9. A foldable crate comprising a bottom, hinged side and end members, means for detachably joining the hinged sides and ends at the corners of the crate, a cover adapted to be supported by the hinged sides and ends, fittings on the sides at their upper  
10 edges having engageable members, fittings on the side edges of the cover having engageable members cooperating with the engageable members of the fittings on the sides, and screws mounted in one of said fittings  
15 and adapted to be drawn partially into the other fitting to lock said fittings together by a screw-bolt connection.

20 10. A foldable crate comprising a bottom, a fixed base portion rising above the bottom to form a quadrangular tray, end and side

members hinged to said base portion to fold inwardly within said tray, a cover having engageable members at its corners, fittings within the fixed base portion adapted to cooperate with the corner members of the cover to detachably retain the cover over the foldable parts within the base portion, said foldable parts having fittings at their upper corners provided with engageable members which, when the foldable parts are extended, cooperate with engageable members at the corners of the cover to detachably secure the cover to the upper edges of the foldable members of the crate when extended.

In testimony whereof, I sign this specification in the presence of two witnesses.

MELZAR SHEPARD.

Witnesses:

H. R. MILLER,

J. OTTO BAENZIGER.

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