

No. 896,299.

PATENTED AUG. 18, 1908.

M. HUTCHINSON.
FOLDING CRATE.

APPLICATION FILED OCT. 29, 1906.

Fig. 1.

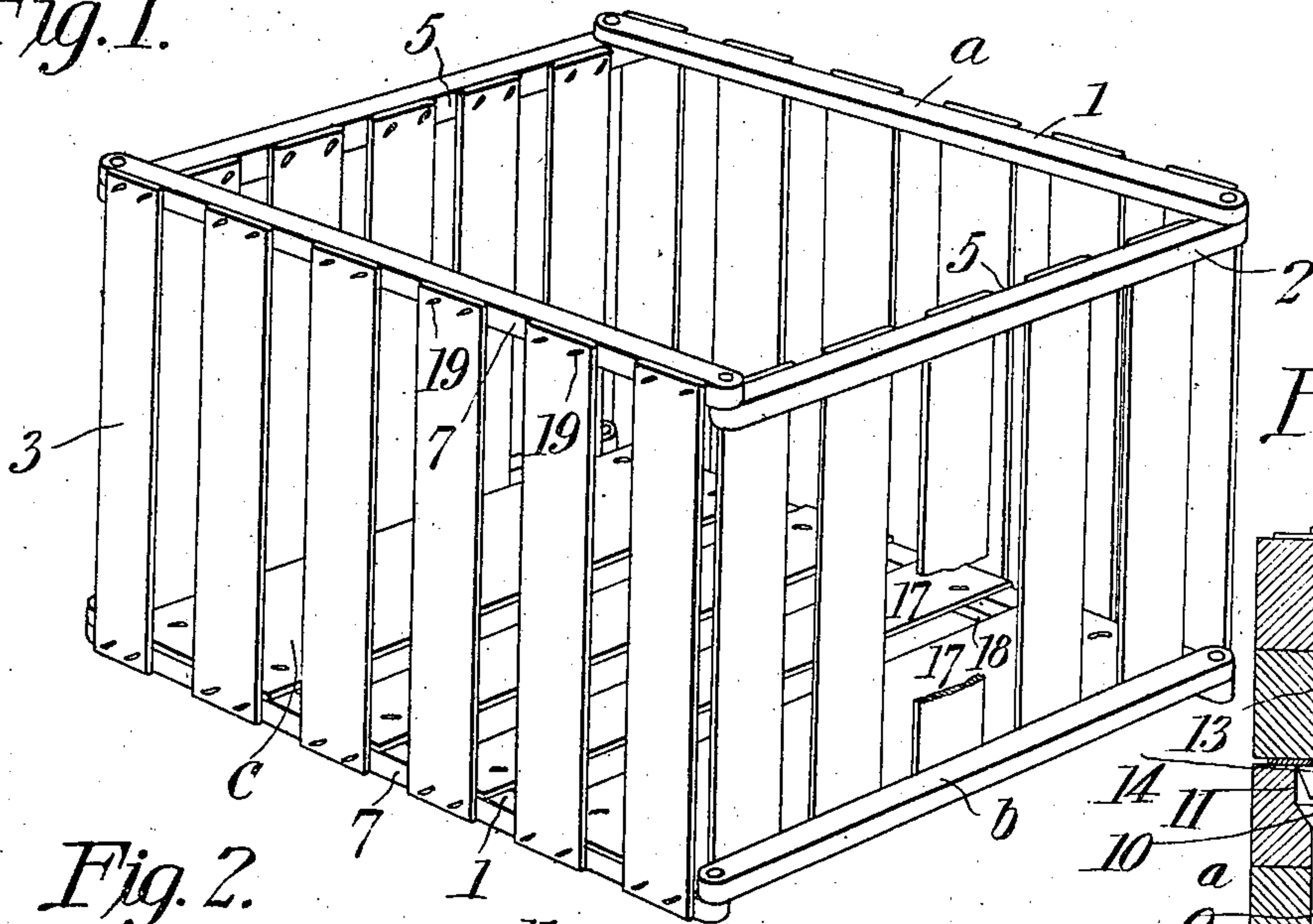


Fig. 6.

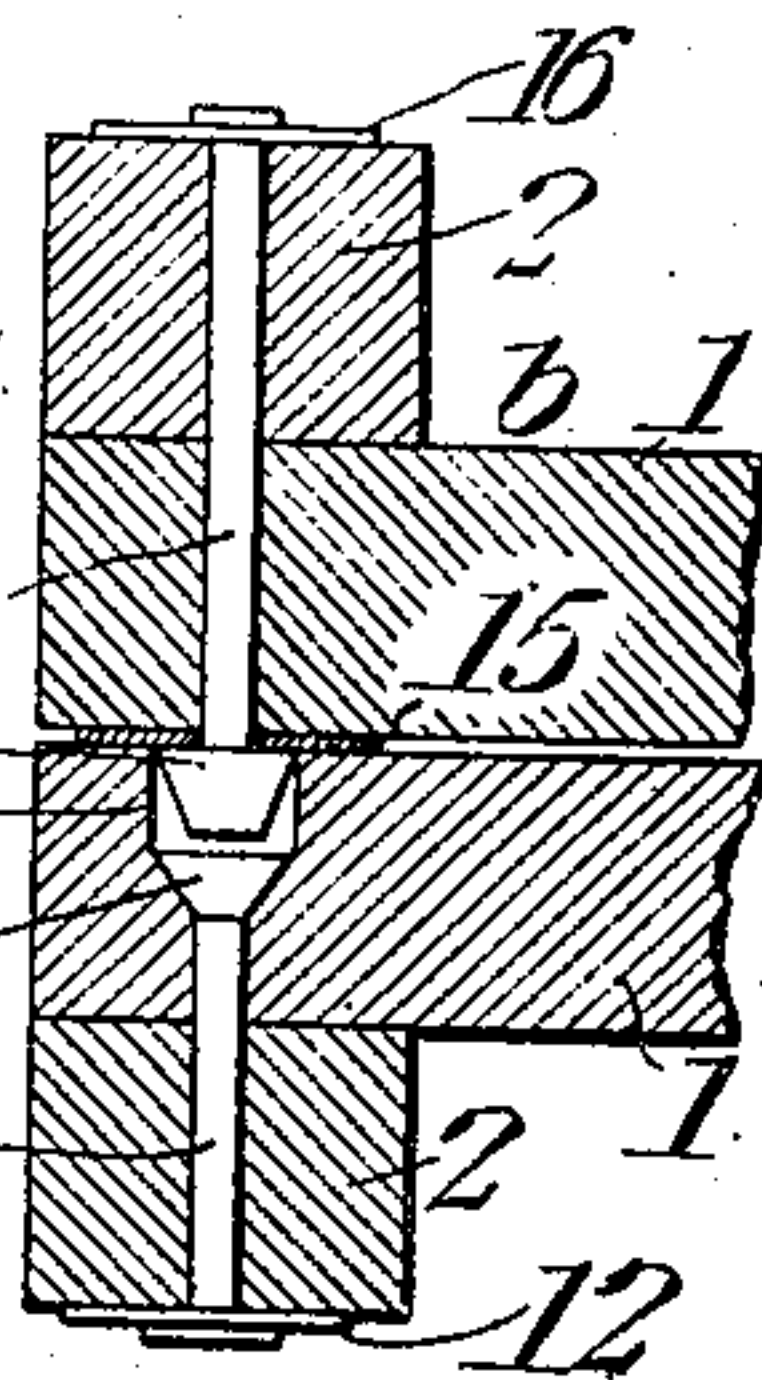


Fig. 2.

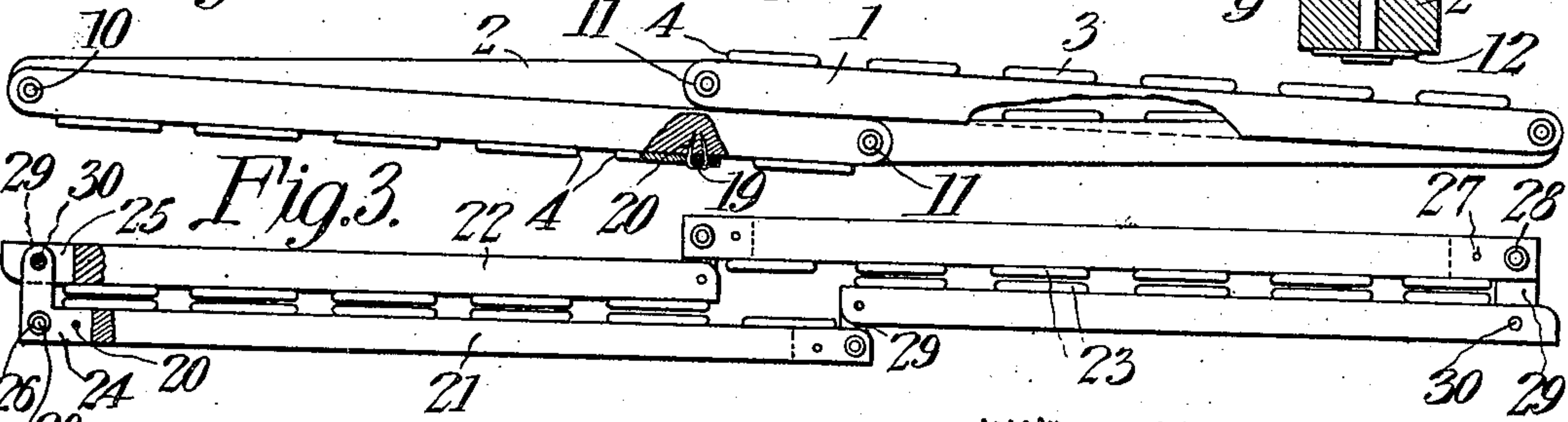


Fig. 3.

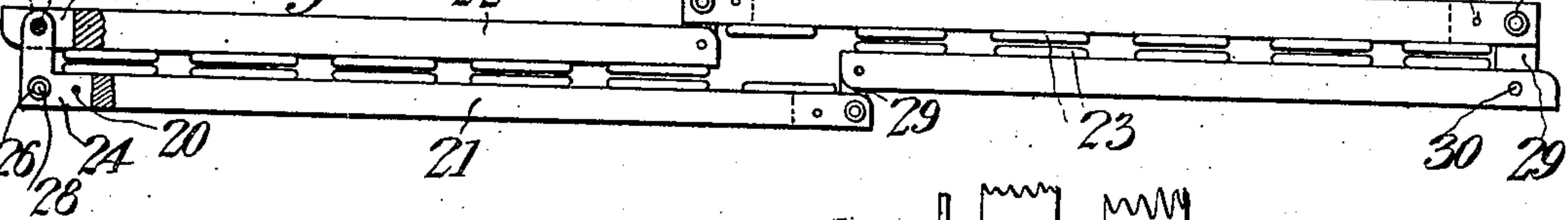


Fig. 4.

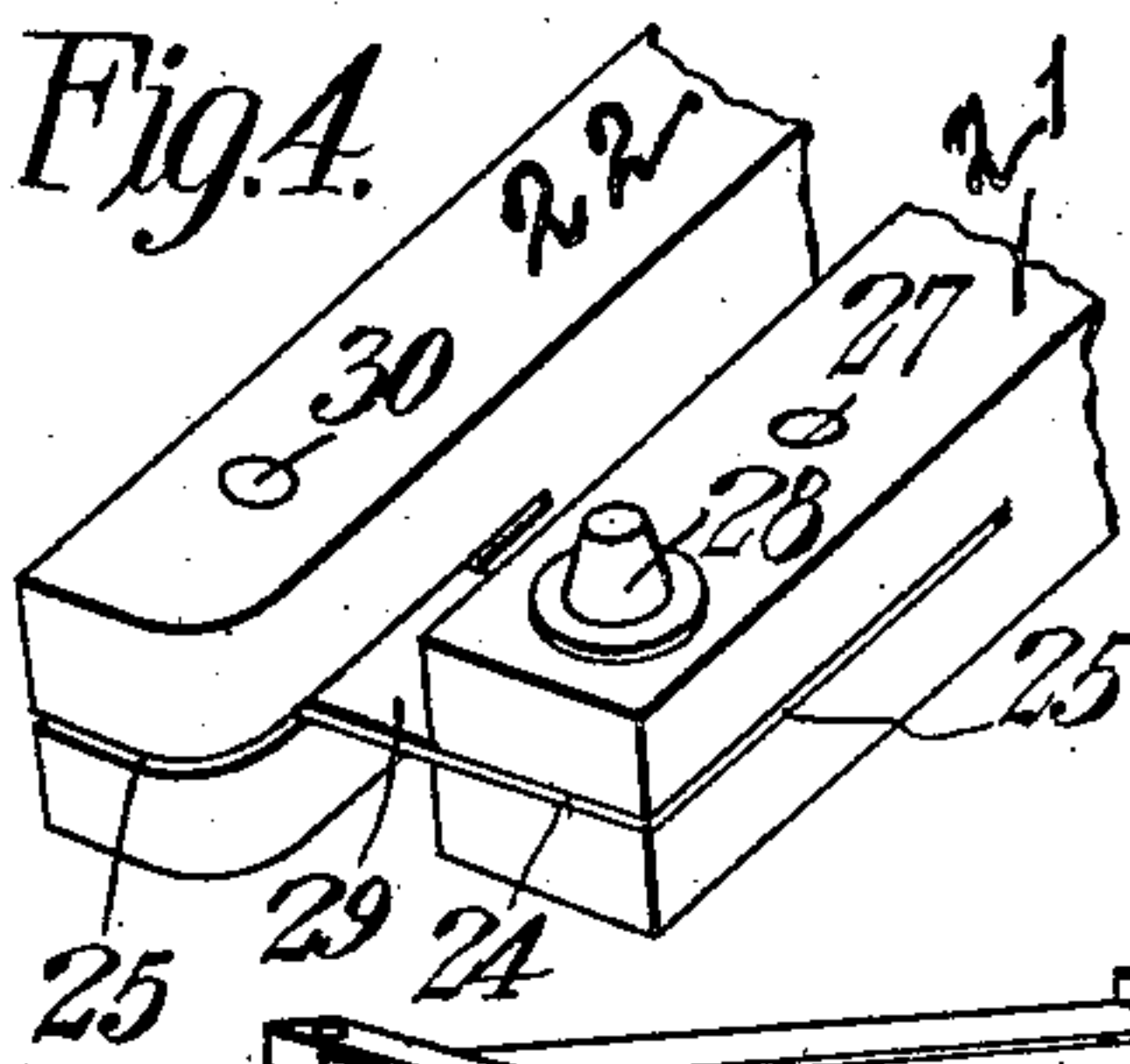


Fig. 5.

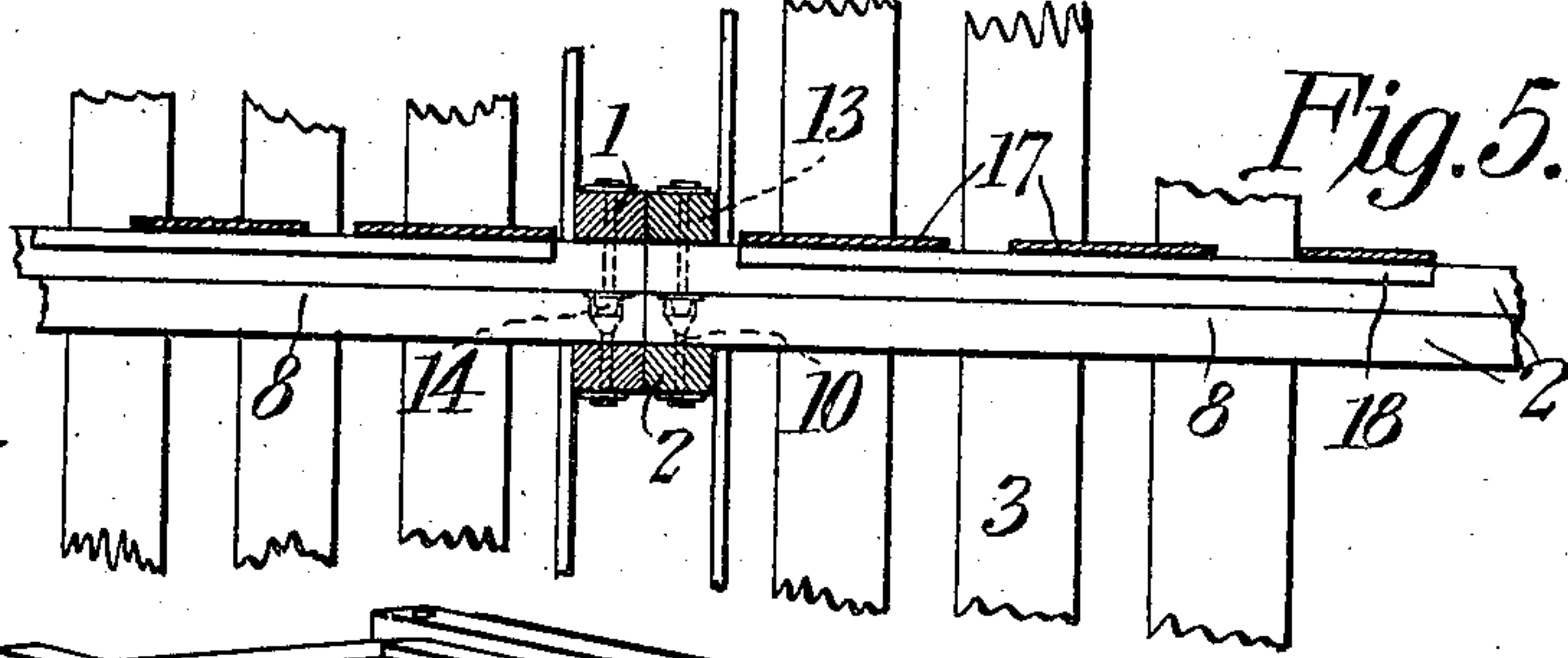
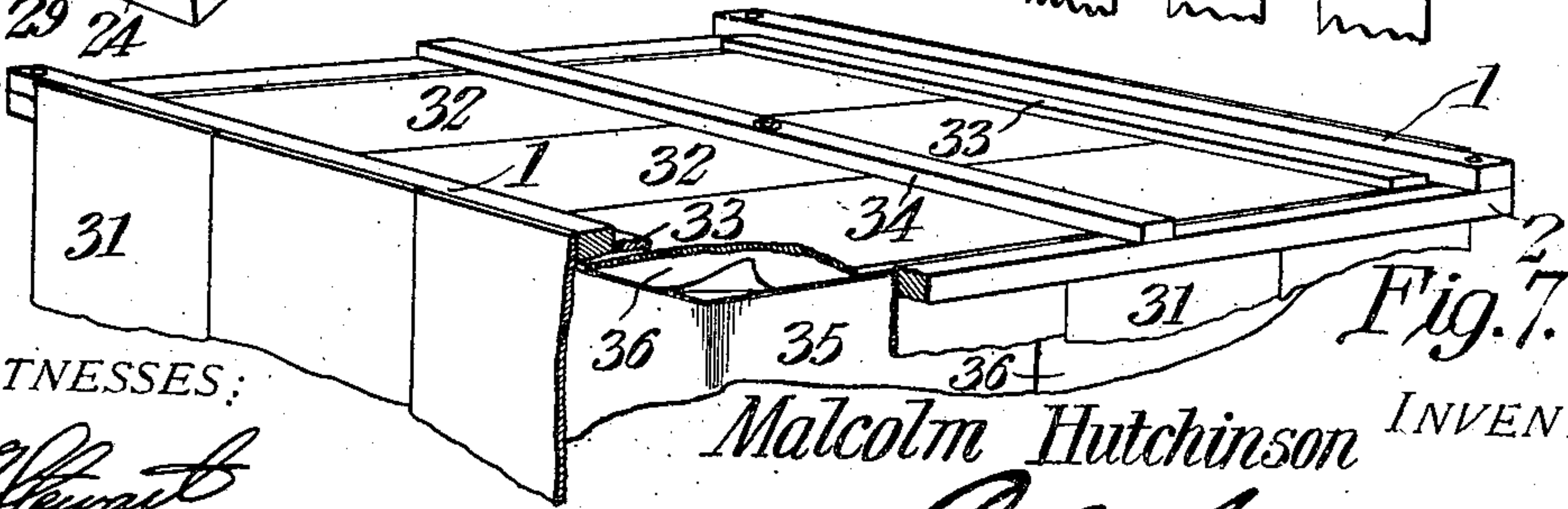


Fig. 7.



WITNESSES:

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MALCOLM HUTCHINSON, OF MUSKEGON, MICHIGAN.

FOLDING CRATE.

No. 896,299.

Specification of Letters Patent.

Patented Aug. 18, 1908.

Application filed October 29, 1906. Serial No. 341,156.

To all whom it may concern:

Be it known that I, MALCOLM HUTCHINSON, a citizen of the United States, residing at Muskegon, in the county of Muskegon and State of Michigan, have invented a new and useful Folding Crate, of which the following is a specification.

This invention relates to a folding crate adapted for use in shipping, carrying and storing various farm and other products, also for use by grocers in displaying and delivering commodities, and for family use for holding or storing fruits, vegetables, and the like.

The invention has for one of its objects to provide a folding crate which is of comparatively simple, inexpensive and substantial construction; easy to handle when loaded, and to fold and unfold; and designed to afford ample ventilation around and through the crate when stacked or piled with others, and to be easily and securely interlocked with adjacent crates.

A further object of the invention is the provision of a crate of this character adapted to be folded into a comparatively small space when the same is to be stored away empty, or to be returned by the agent, commission merchant, or consumer, to the farmer or other producer, thereby economizing room in the cars transporting them.

A further object of the invention is to construct a crate having its sides hingedly connected by rivets provided with heads which are adapted to interlock in sockets of adjacent crates, so that a plurality of crates can be piled one on another so as to give stability to the pile and prevent the crates from being accidentally toppled over, slipped off each other, or jolted apart by shocks during transportation, or for any other ordinary reason.

Another object is to provide a crate having the various features referred to, and in addition provided with means especially adapting it for carrying, storing, or shipping perishable products during moderately cold weather without danger of the products being frosted and damaged.

With these objects in view, and others, as will appear as the nature of the invention is better understood, the invention comprises the various novel features of construction and arrangement of parts, which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawing, which illus-

trates certain of the embodiments of the invention, Figure 1 is a perspective view of a folding crate of the slotted type shown in its unfolded or normal position. Fig. 2 is a plan view of the crate in folded position, portions thereof being broken away. Fig. 3 is a plan view of a modified form of crate in folded position. Fig. 4 is a detail perspective view of the hinge connection employed in the modified construction. Fig. 5 is a fragmentary sectional view of the adjacent corner portions of four crates piled together to show the ventilating spaces between the piles and between adjacent crates of each pile, and to show the interlocking means of the crates. Fig. 6 is an enlarged detail sectional view showing one of the interlocking means between adjacent crates. Fig. 7 is a perspective view, partly broken away, of the top portion of a crate for winter use.

Corresponding parts in the several figures are indicated throughout by similar characters of reference.

Referring to the drawing, and more particularly to Fig. 1, *a* designates the top frame, *b* the bottom frame and *c* the bottom or floor of the crate. The frames *a* and *b* are each composed of side and end bars 1 and 2 made from strips of wood of suitable size and riveted together at their ends. The four sides of the crate comprise, in the present instance, the vertical slats 3. These slats and those portions of the frame to which they are connected constituting side panels of the crate. These slats have rounded edges 4, as shown clearly in Fig. 2, so as to avoid bruising the fruit and similar commodities, and the slats are disposed perpendicular for the same reason.

In that class of crates having horizontal slats, some of the fruit is more or less bruised by coming in contact with and being pressed against the edges of the slats by the weight of the superposed fruit. The slats at the ends of the crate are secured to the inner faces 5 of the end bars 2, so that the said bars are disposed on the outside of the crate and thus afford no obstruction to the contents when the crate is emptying.

The end bars 2 being located on the outside of the crate form handles whereby the loaded or empty crate can be conveniently picked up and carried, or otherwise handled. A further function possessed by the end bars 2 is that they act as spacers whereby venti-

lating spaces are provided between the ends of adjacent crates stacked in juxtaposed piles. These vertical spaces will be better appreciated by reference to Fig. 5, in which the end bars 2 serve to space the crates of adjacent piles so as to provide air passages. The slats at the sides of the crate are secured on the outer faces 7 of the side bars 1 of the top and bottom frames *a* and *b*. The side bars 1 of the top frame rest on top of the end bars 2 while the side bars of the bottom frame *b* are disposed under the end bars 2 thereof. Thus when a number of crates are piled one on top of another, the side bars are placed on the side bars of the crate above or below the same, so that a horizontal ventilating space will be provided between each pair of adjacent crates, such ventilating spaces being shown at 8, Fig. 5.

The side and end bars of the top frame *a* are riveted together at their ends by rivets 9, one of which is shown clearly in Fig. 6. The head 10 of each rivet is countersunk to such a depth as to provide a socket or depression 11 above the head 10. The end of the rivet 9 opposite from the head is provided with a washer 12, and the extremity of the rivet is expanded or riveted against the washer, which latter bears against the end rail 2, as shown. The rivets 13 for connecting the ends of the side and end bars 1 and 2 of the bottom frame *b* are each provided with a frusto-conical head 14 which acts as a dowel for engaging in the socket 11 in the corresponding corner of the crate next below the same. The bottom of each crate is thus provided with four projections, one at each corner, which serve as pins for locking a superimposed crate to an under one. Under the head 14 of each bolt is provided a washer 15 and on the opposite end of the bolt or rivet 13 is a washer 16 and between the washers are confined the adjacent ends of the bars 1 and 2 of the bottom frame *b*, as shown in Fig. 6.

When a number of crates are piled one on top of another, as shown in Fig. 5, the crates are locked together, so that they cannot slide apart and fall, due to jolting of the vehicle in which they may be transported, or for any similar reason.

As shown in Fig. 6, the sockets 11 are cylindrical and as the heads 14 of the rivets are frusto-conical, the heads can be easily engaged in the sockets when one crate is placed on another, and when so engaged, the heads will not stick, so that the crate can be lifted off without any trouble. Furthermore, by reason of the heads of the rivets being frusto-conical, they can be readily engaged and centered in the sockets of an adjacent crate.

The bottom *c* is made separate from the sides of the crate and comprises the strips 17 connected to cleats 18 on the bottom of the

strips and at the ends thereof. The bottom is inserted in the crate from the top and fits between the sides with the ends of the strips 17 projecting beyond the cleats 18 resting on the side bars 1 of the bottom frame *b* and the bottom serves to hold the sides of the crate open or in unfolded position. The strips 3 and 17 are secured, respectively, to the bars of the top and bottom frames and to the cleats 18 preferably by staples 19. Two or more of these staples are used at each end of a strip, and, as shown in Fig. 2, the prongs 20 of the staples are beveled at their ends so that the prongs are drawn toward each other as they are driven into the wood, thus forming a loop in the wood firmly holding the strips in place.

In the modified form of crate shown in Figs. 3 and 4, the side and end bars 21 and 22 are disposed on the outside of the slats 23 forming the four sides of the crate. In this construction, hand-holds and spacers are arranged on all four sides, so that the crate can be conveniently gripped from any side, and so that vertical ventilating passages or spaces are provided on all four sides of the crate. In order to permit the sides of the crate to fold compactly against the ends, a special form of hinge is employed to connect the ends of the side and end bars 21 and 22. These hinges each comprise a sheet metal stamping, or the like, 24, shown more clearly at the left hand end of Fig. 3, the said stamping or member being L-shaped. The ends of the bars 21 and 22 are slotted longitudinally at 25 so as to receive the members 24. Each member 24 is provided with three apertures 26, one being arranged adjacent the extremity of each leg of the member and the other at the portion between the legs, as shown in Fig. 3. In the present illustration, the hinge members 24 are rigidly secured to the ends of the side members 21 in the slots 25 thereof by means of rivets 27 and 28 that pass through two of the apertures of each hinge member. The end bars 22 are pivoted to the arms 29 of the hinge members by the rivets 30. The arms 29 are of sufficient length to provide sufficient space between adjacent bars 21 and 22 to receive the slats 23 and permit the sides of the crate to fold compactly together, as shown in Fig. 3.

In Fig. 7 is disclosed the manner of constructing a crate intended more particularly for winter use, so as to permit perishable commodities to be shipped without danger of being damaged by the cold. The top and bottom frames of the crate may be, and preferably are, similar to the frames shown in Fig. 1, but the sides comprise boards 31 stapled to the bars of the top and bottom frames and fitted closely together so as to make tight joints. The bars 1 and 2 of the top and bottom frames are riveted together and provided with interlocking means, so that the

crates can be locked one to another in the manner above referred to. The top and bottom of the crate are similar, so as to be interchangeable, and each comprises the boards 5 32, stapled or otherwise secured to the outside end strips 33. These strips are arranged slightly inwardly from the ends of the board 33 so that the said ends can engage under the side bars 1, as shown. The top and bottom, 10 or heads of the crate, are locked in position by means of cleats 34, each centrally pivoted on its respective head and of sufficient length to engage over the end bars 2. Thus the cleats prevent the heads from moving inwardly, while the side bars 1 prevent the 15 heads from moving outwardly. To further insure the exclusion of frost, the interior of the box is covered by a loose lining. This lining comprises an endless strip of heavy 20 paper 35, or the like, which is as wide as the height of the crate and as long as the aggregate longitudinal dimensions of the four sides of the crate. The ends of the strip of paper are glued together, or otherwise fastened, at 25 36, so that this portion of the lining can be fitted to the inside of the crate. The top and bottom of the crate are lined with rectangular pieces, one of which is indicated at 36. The top and bottom pieces of the lining are 30 separate from the main portion 35, and they coöperate with the latter to form a frost excluding lining. If desired, the crate shown in Fig. 1 can be used with a top closure having means for locking it in position similar

to that described in connection with Fig. 7 35 for locking the heads in position.

I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, but I desire to have it understood that the apparatus shown is merely 40 illustrative, and that various changes may be made, when desired, as are within the scope of the invention.

What is claimed is:—

A crate comprising oppositely disposed 45 panels, each panel consisting of parallel bars constituting handholds and members secured to the inner faces of and connecting the bars; oppositely disposed panels consisting of parallel bars extending across the first mentioned 50 bars and constituting spacers, and members connected to said spacers, said spacers being disposed to assume positions at opposite sides of the first mentioned panels; and rivets pivotally connecting the handholds and spacers, 55 each rivet having a frusto-conical head at one end and a corresponding countersink in its outer end, said head and countersink constituting interlocking means for a plurality of 60 superimposed similar crates.

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

MALCOLM HUTCHINSON.

Witnesses:

OSCAR W. ANDERSON,
MORRIS D. READING.