United States Patent [19]

Welton

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[45] **July 24, 1973**

[54] **DISPLAY APPARATUS**

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[73] Assignee: **Morton Metalcraft Co.**, Morton, Ill.

[22] Filed: **Jan. 6, 1971**

[21] Appl. No.: **104,272**

[52] **U.S. Cl.** ..... **240/2 AT**, 40/132 R

[51] **Int. Cl.** **G09f 13/00**

[58] **Field of Search** ..... 240/2 AT, 2 AD; 40/132 A, 132 D; 132 R; 240/2 R

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Assistant Examiner—Denis E. Corr
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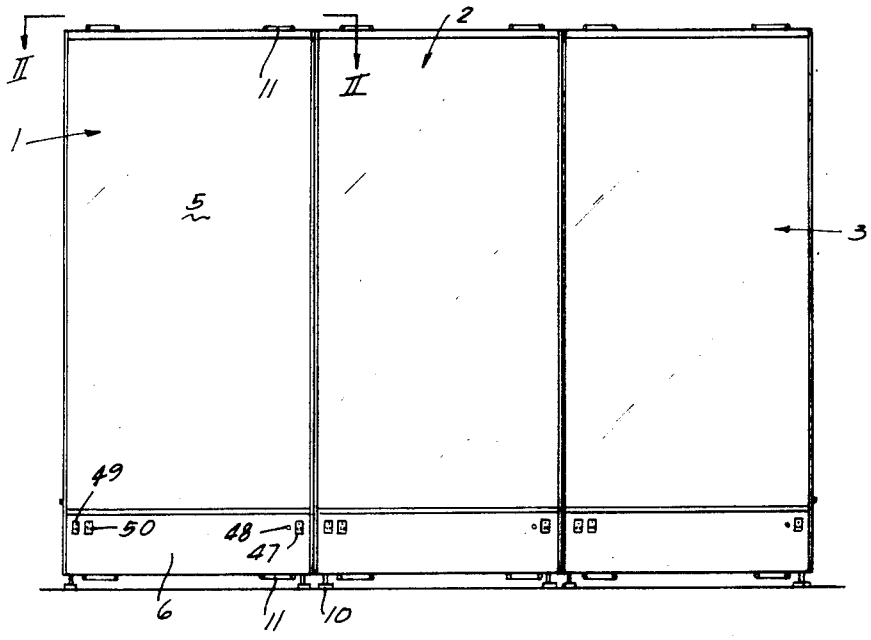
[57] **ABSTRACT**

A portable display apparatus for exhibiting at a trade show or the like, and embodying a unit in the general form of a foldable light box easily set up without any tools and which may be transported easily from place to place in a station wagon or light truck, including an interchangeable translucent panel to carry transparencies or other visual exhibits. A plurality of units may be connected together for larger exhibits.

10 Claims, 10 Drawing Figures



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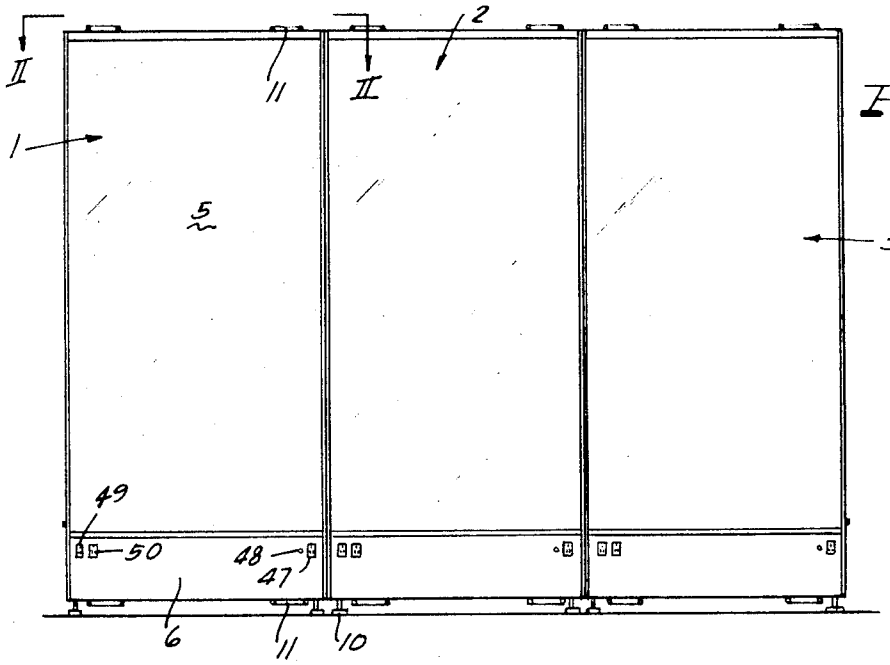

Fig. 1

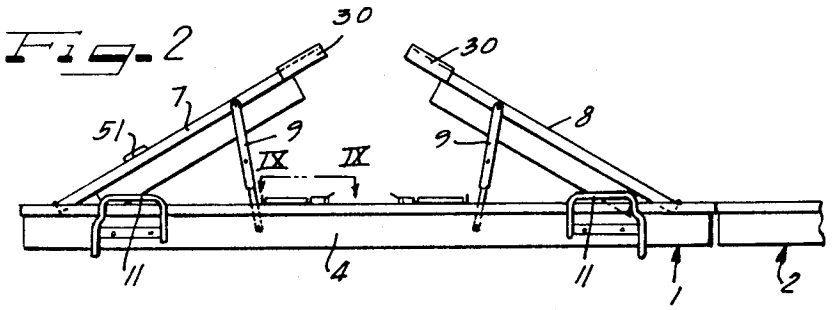

Fig. 2

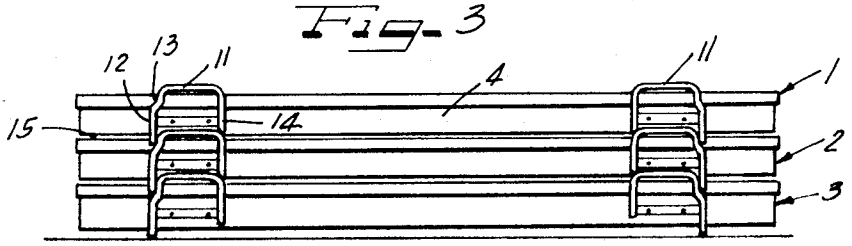

Fig. 3

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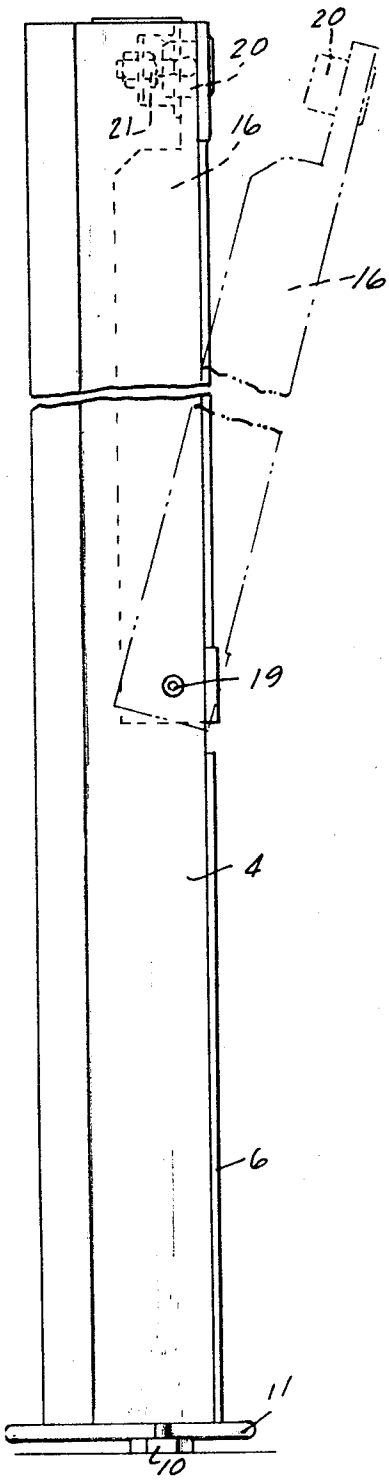

Fig-4

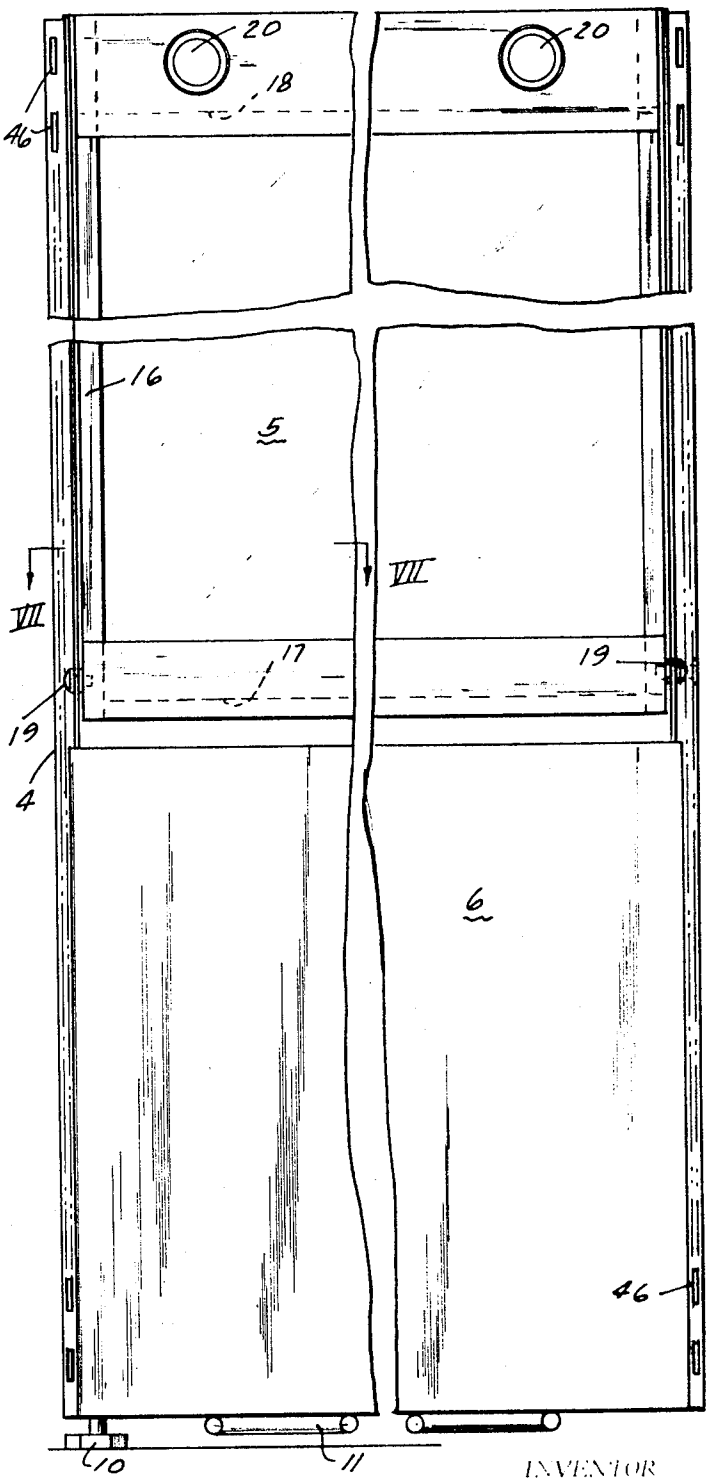

Fig-5

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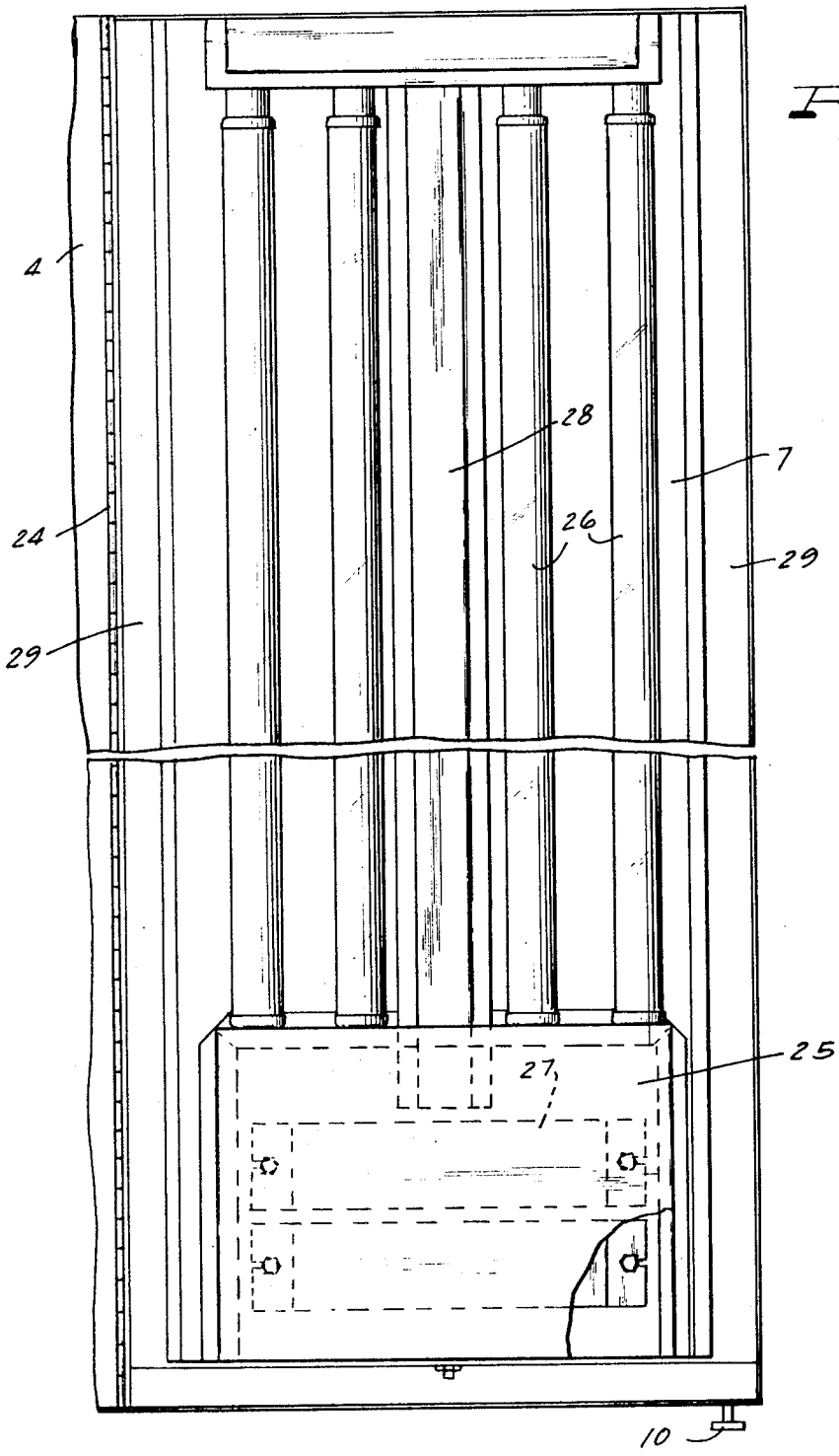

Fig-6

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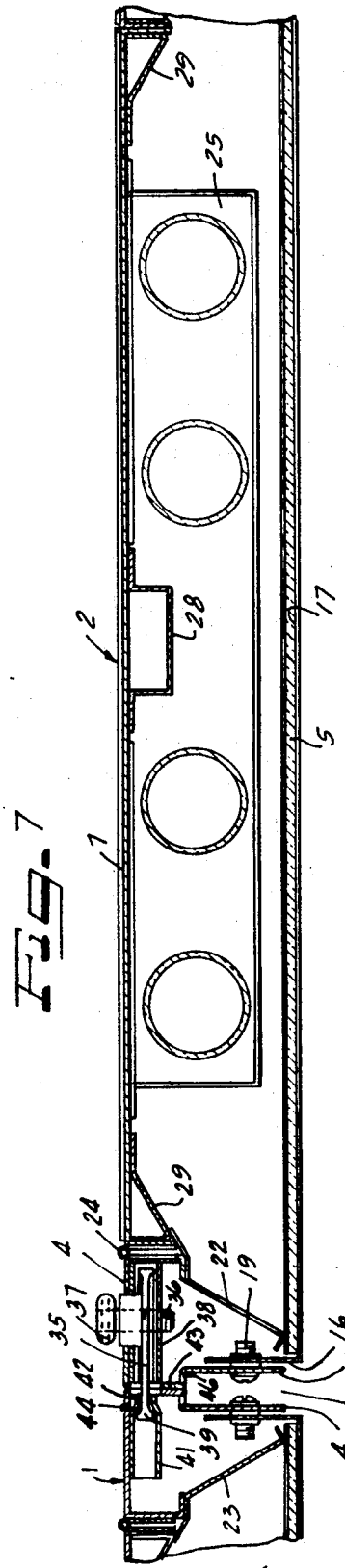

Fig. 7

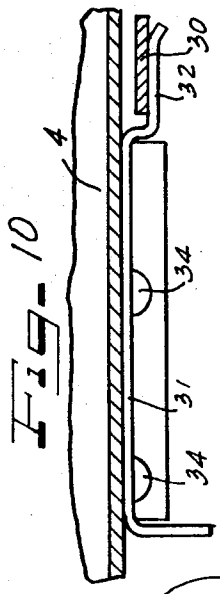

Fig. 10

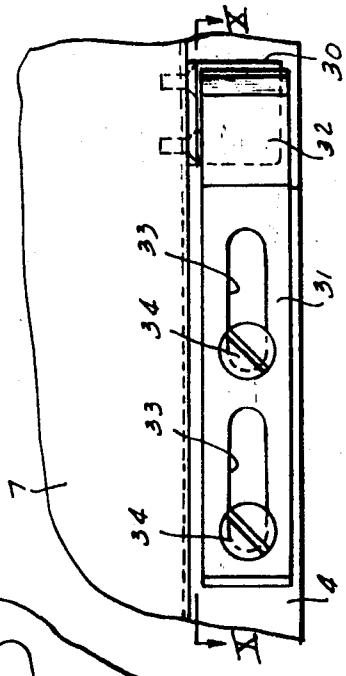

Fig. 9

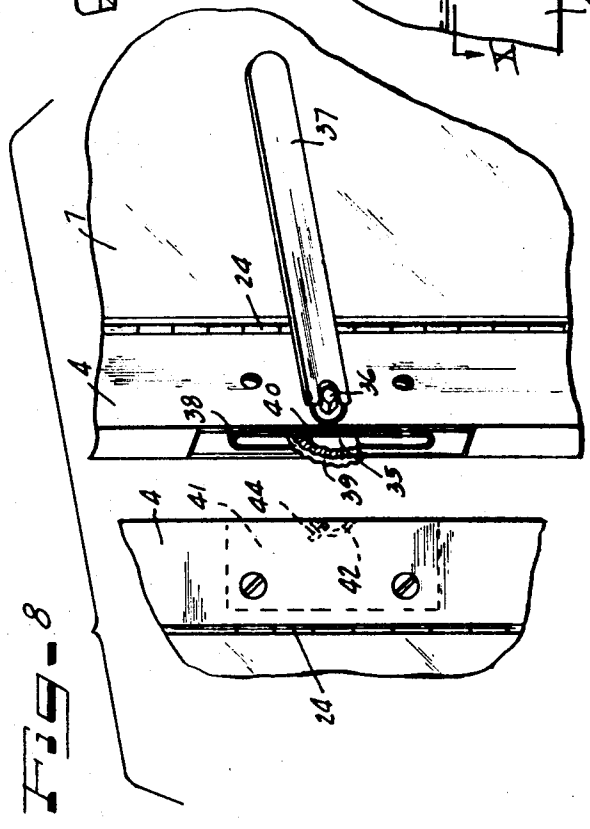

Fig. 8

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DISPLAY APPARATUS

SUMMARY OF THE INVENTION

In the past, insofar as I am aware, it has been customary when renting a booth for an exhibit at a trade show or the like to install display stands or whatever is needed to properly present an exhibit of specific products, requiring the employment of carpenters and quite frequently electricians and other help. After the exhibit or trade show is over, it is necessary to remove all of the apparatus and leave the booth space vacant. Such procedure is expensive and time consuming, and at times results in a particular exhibitor not being ready with his exhibit at the time the trade show is opened to the public, dealers, distributors, or others likely to attend.

With the foregoing in mind, the instant invention relates to a display unit in the form of a foldable light box, including a front frame carrying a translucent or transparent panel which can be removed and replaced by another panel in a matter of seconds. Behind the panel, each unit includes a pair of doors foldable into the panel frame, and each door carries its own individual lighting system for illumination of the panel. Each such unit is readily connectible to an adjacent unit so that the overall size of the exhibit may be varied as may be desired. Transparencies may be placed on the panels for illumination therethrough, or physical exhibits may be placed in front of the panels on suitable shelves or the like. It is simply necessary when setting up an exhibit to stand each unit on end, and open the doors at an angle to the vertically disposed panel, each door being provided with suitable leveling means, and the unit is self-sustaining. It is then only necessary to connect the lighting circuits to a convenient outlet commonly provided in a rented booth or space. No tools of any kind are required to set up or take down a unit or connect one unit to another unit. Consequently, a complete exhibit may be prepared in a matter of minutes for public view. Further, the translucent panels prepared for an ensuing exhibit, may be shipped ahead to be ready when the units arrive at the next exhibit location where they may be substituted for the panels used at the previous exhibit. When each unit is folded the units may be stacked one upon the other with nesting parts to maintain them in proper position, and easily loaded into a station wagon or similar light vehicle. The units are sufficiently light in weight that one man may carry a unit, although two men may be preferable due to the awkward size of the unit. Each unit is economical, long lived, and obviously extremely economical to use.

Other objects, features and advantages of the invention will be readily apparent from the following description of a certain preferred embodiment thereof, taken in conjunction with the accompanying drawings, although variations and modifications may be effected without departing from the spirit and scope of the novel concepts of the disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 discloses a display exhibit embodying three separate units, each unit embodying principles of the instant invention, showing the same in operative position;

FIG. 2 is a fragmentary top plan view of the structure of FIG. 1 taken substantially as indicated by the line II—II of FIG. 1;

FIG. 3 is a view showing the three units stacked in folded position for transportation or storage purposes;

FIG. 4 is an enlarged fragmentary side elevational view of one of the units, indicating in dotted lines how a panel may be pivoted for removal and replacement thereof;

FIG. 5 is a fragmentary front elevational view of the structure of FIG. 4;

FIG. 6 is a fragmentary inside elevational view of one of the doors of a unit;

FIG. 7 is an enlarged fragmentary plan sectional view taken substantially as indicated by the line VII—VII of FIG. 5;

FIG. 8 is an enlarged fragmentary rear-face diagrammatic view illustrating how two adjacent units may be locked together;

FIG. 9 is an enlarged fragmentary rear elevational view indicating how a unit door may be secured in folded position for transportation; and

FIG. 10 is a fragmentary plan sectional view taken substantially as indicated by the line X—X of FIG. 9.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The instant invention is preferably made of sheet metal, metallic fastening and connecting means, and a translucent plastic panel. The invention embodies a single unit which may alone function as an exhibit assembly, and which may be connected to one or more identical units to form an exhibit of larger size.

In FIG. 1 there is shown an exhibit in operative position comprising units 1, 2 and 3. Since these units are identical in construction, only one need be specifically described. Each unit may be of any desirable size, and a unit approximately 7 feet high and approximately 40 inches in width has been found to be a very convenient size.

Each unit comprises a main frame 4 extending entirely around the structure, such frame preferably being of channel formation wherever needed for added strength and yet maintain lightness in weight. On the front side thereof, the main frame 4 carries a translucent panel 5, preferably made of a suitable plastic material having certain flexibility, such, for example, as a thermoplastic polymer of methyl methacrylate. Below the panel 5 is an opaque panel 6 which conceals lighting equipment as will later appear.

When in display position, the structure will appear as shown in FIG. 2, a pair of light-carrying doors 7 and 8 being hinged to the main frame and held in partially open position by suitable brace members 9 — 9. The unit then rests on suitable level adjusters 10 on the bottom of the main frame and on the bottom of the free end of each door. Generally, the doors will be cocked at an angle in the neighborhood of 30° to 40° relatively to the main frame so as to illuminate the panel 5 to the desired extent.

When not in use, or during transportation, the doors are folded into the main frame, and latched in position, as seen best in FIG. 3. Also, for transportation purposes, the units may be stacked one upon the other and disposed flat upon the floor of a vehicle. To this end, a unit is provided with a pair of handles 11—11 at each end, the handles being secured to the top and bottom portions of the main frame. As seen best in FIG. 3, it will be noted that the outer leg 12 is offset by a bend 13 and is longer than the inner leg 14. This permits the

end of the outer leg to assume a nested engagement at the bend in a handle therebelow on another unit, and the inner leg to rest on top of the handle of the adjacent unit. Thus, the inner handle legs **14** maintain a space **15** between superposed units so as to avoid any injury to the panels **5** and the outer legs by virtue of the nested relationship prevent lateral shifting of one unit relatively to another. Of course, the handles are used to expedite loading and unloading of the units.

In the showing of FIG. **1**, the panel **5** is illustrated at its full length, but it will be understood that should it be desired to put a shelf or table in front of the exhibit, the panel **5** may be made shorter and the panel **6** longer, depending upon the desires of the particular exhibitor.

Looking more particularly at the greatly enlarged showings in FIGS. **4**, **5** and **7** of the drawings, it will be seen that the translucent panel **5** is carried in a frame **16** which when closed is nested inside the main frame **4**. The frame **16** completely surrounds the edges of the panel **5** and the bottom portion of the frame is provided with a groove **17** into which one end of the panel seats, FIG. **7**. A similar groove **18** is provided in the upper portion of the frame as indicated in FIG. **5**. The panel **5** is sprung into the frame **16** by seating a marginal portion of the panel in one of the grooves **17** and **18** and flexing the panel intermediately until the opposite edge snaps into the other groove. The panel **5** may be removed from the frame simply by pressing on the intermediate portion thereof unitl one edge snaps out of its respective groove. This operation, of course, can be accomplished in a matter of seconds for the changing of panels. The frame **16** is pivoted adjacent its lower end to the main frame **4** by opposed pivot studs **19-19** so that it may be swung out of the main frame **4** as indicated by dotted lines in FIG. **4**, into a free position to permit ready changing of the panel **5**. When the frame **16** is inside the main frame **4**, in position for operation, it is held in such position against accidental outward pivoting by one or more female snap elements **20** engagable with one or more male snap elements **21** mounted within the frame **4**. As seen in FIG. **7**, when the frame **16** and panel **5** are pivoted to closed position inside the frame **4**, a spring **22** which extends the full length of the panel **5** and which is mounted in the frame **4** presses against the marginal portion of the panel **5** to stabilize it, and an allochiral spring **23** is mounted in the frame **4** at the opposite side. By "allochiral" is meant similarly constructed except for one being left and the other being right. Thus, the panel is maintained in fixed position during transportation and an exhibition. Each of the springs **22** and **23** are provided with reflector surfaces to aid in concentrating light against the back of the translucent panel **5**.

The aforesaid doors **7** and **8** on the back of the unit are identical in construction, except for being allochiral. As seen best in FIGS. **6** and **7**, each door is hinged to the main frame **4**, preferably by a piano hinge **24**. On the inside thereof, each door is provided with a base box **25** which is disposed behind the opaque panel **6** below the translucent panel **5** so that the box is concealed from an observer of an exhibit on the translucent panel. Mounted in suitable sockets in the box **25** of standard construction, are a plurality of upstanding fluorescent lamp tubes **26**. The necessary ballast **27** for each pair of tubes is disposed within the box **25** and the necessary wiring is of well known construction. The weight of the ballast members **27** being at the base of each door stabilizes the door as well as the entire unit when set up for exhibition purposes. Substantially centrally thereof, each door is reinforced by a vertical channel **28**, which also may function as a conduit for wiring extending upwardly therethrough for a canopy light, if such is used on the unit during an exhibit. The door also carries a pair of opposed reflectors **29–29**, one extending along each side edge of the door lengthwise thereof. These reflectors are angled in a manner to cause more light from the tubes **26** to illuminate the translucent panel **5**.

As seen in FIG. **2**, each of the doors **7** and **8** carries an angle member **30** on each end thereof. When a door is in closed position a flange of an angle **30** overlies a portion of the main frame **4**, as best seen in FIGS. **9** and **10**. A slide latch **31** having an offset end portion **32** is mounted on the frame **4** to slide back and forth thereon, this latch being shown in closed position in FIGS. **9** and **10** with the offset end **32** disposed over the flange of the angle **30** so as to hold the door against accidental opening. The slide **31** is provided with one or more elongated slots **33** of a size to fit the shanks of a bolt or rivet **34** whereby the slide latch may be moved from locking to open position.

In FIGS. **7** and **8** there is shown means for connecting two of the display units together to provide a larger size unit as indicated in FIG. **1**. To this end, each unit is provided with one or more handle controlled cam latching members set in one side of the main frame **4** and one or more receiving receptacles set in the opposite side of the main frame **4**. In all units the latch means will be on the same side and the receiving receptacles on the same side. It is preferable to have one such interlocking arrangement near the bottom of a unit and another near the top of the unit.

With reference to the diagrammatic showing in FIG. **8**, it will be seen that the camming latch means in the frame **4** of a door includes a cam **35** mounted on a stud shaft **36** with a handle **37** pivotally connected to the shaft. The cam assembly is contained in a receptacle **38** secured in the frame **4**. The cam itself is shaped in the form of a 180° sector of a circle and having an enlarged circumferential rim **39** which is notched along at least one side thereof as indicated at **40**. When the handle **37** is in a straight downward position, none of the cam will be exposed beyond the edge of the frame **4**. With the handle in a vertical upright position, nearly all of the cam will be exposed. It is to be noted, as best seen in FIG. **7**, that the cam latch is eccentrically mounted on the pivot stud **36**. The other side of the main frame **4**, as well as the frame **4** on an adjacent unit, is provided with a receptacle **41** set into the frame through an opening therein. This receptacle has its side walls bent in centrally of the receptacle, as indicated at **42** to an extent that the intermediate portion of the cam latch **35** is passed through the narrowed opening, but the enlarged rim **39** of the cam will engage behind the recessed wall portions and cannot pass through the opening between those recessed wall portions. Accordingly, when the frames of two adjacent units, FIG. **7**, are disposed together, with the aid of the handle **37**, the cam latch may enter the receptacle **41** and when rotated the inner portion of the cam latch **35** will pass between the reduced portion defined by the recessed walls **42**, but the enlarged rim of the cam will remain outside that recessed wall portion, and due to the eccentric mounting of the cam, as the handle is further turned, the two unit

frames will be forced into tight contact with each other as indicated at **43**. In one of the recessed small portions **42** of the receptacle **41**, a detent is provided for engagement in the notches **44** of the cam latch. This engagement is not sufficiently strong to interfere with the rotation of the latch, but is sufficient to hold the engagement against unintentional movement of the handle **37**.

It will be noted, with reference to FIG. **7**, that the frames are bent slightly outwardly to provide the confronting portions at **43** and outwardly thereof there is a small space **45** between the adjacent frames **4—4** of connected units. That space **45** is extremely narrow so as not to interfere with the overall appearance of the unit, and, in effect, the space is so narrow that when connected units are illuminated the narrow junction between adjacent panels is invisible to the casual observer. Notwithstanding the narrowness of the space **45**, there is still room to permit insertion of supporting brackets for shelving and the like in a row of apertures **46** extending lengthwise on each side of the frame as indicated more clearly in FIG. **5**. In many cases it is desirable to place a shelf across the front of the unit to support a physical exhibit. With the instant invention, supporting means may be engaged with the unit in the extremely narrow space **45**.

It will be understood that the wiring for each unit is of a known character, and preferably on the opaque panel **6** of a unit there is provided a convenience outlet **47**, and an indicator light **48**, each unit having a thermal circuit breaker and the light **48** is illuminated should the circuit breaker open. A pair of rocker switches **49** and **50** are also provided to control the illumination of the translucent panel **5** and the illumination of a canopy, if such is used over the exhibit assembly. A convenience outlet **51**, FIG. **2**, is provided on one of the doors **7** or **8** for canopy-illuminating purposes, as well.

From the foregoing, it will be apparent that I have provided a self-sufficient portable and foldable display unit which includes an interchangeable translucent front panel and illuminating means therebehind. The unit may be set up for display purposes without the use of any tools, and in a matter of minutes is ready for public observance. For transportation purposes a number of units may be stacked one upon the other, and as many units as may be desired for an exhibit may be connected together. The units are extremely economical, especially in labor saving, are long lived and highly attractive.

I claim as my invention:

1. In a portable display unit for disposition in an upright position standing on its lower edges,
- a main frame,
- a translucent panel in the front side of said frame,
- a pair of allochiral doors each hinged at one side to said frame adjacent the outer side thereof to permit said doors to be swung into and out of said frame,
- brace means to hold said doors at an angle to said main frame to make said unit self-sustaining in an upright position when in use, and
- illuminating means carried by each said door to light up said panel and an exhibit thereon.

2. The display unit of claim **1**,
- wherein said illuminating means are upright fluorescent tubes with ballast therefor at the lower end of each said door to add to the stability of the unit when in use.

3. The display unit of claim **1**, including
- handle means on each end of said frame projecting laterally beyond the frame and shaped for engagement with similar handle means on another unit,
- whereby when a plurality of closed units are stacked flat one above the other, the handles will maintain a slight space between adjacent units.

4. The display unit of claim **1**, including
- a subframe carrying said translucent panel pivoted at one end to said main frame to swing into and out of said main frame,
- upper and lower channels in said subframe to receive opposed marginal portions of said panel, and
- said panel being bodily flexible sufficiently to permit snapping one of said marginal edges into and out of the respective groove with the opposite marginal portion disposed in its groove.

5. The desplay unit of claim **4**, including an elongated spring member extending along each side of said main frame to bear against the side margins of said translucent panel when said subframe is in said main frame to hold said translucent panel rigid during an exhibition and in transit.

6. The display unit of claim **5**, wherein said spring members have inward light reflecting surfaces.

7. The display of claim **1**, including a pair of generally U-shaped handles on each end of the unit,
- the outer leg of each handle having an outward bend therein and being longer than the inner leg,
- whereby when a number of units are stacked one upon the other the outer leg of an upper handle will nest in the bend of a lower handle and the inner leg of an upper handle will rest upon the upper part of a lower handle.

8. The disply unit of claim **1**, wherein said main frame has on each side thereof an outstanding channel portion spaced inwardly from the front edge of the frame for confronting contact with an adjacent unit, and
- the front face of said channel portion having a row of spaced apertures therealong to receive supporting brackets for shelving.

9. The display unit of claim **1**, including an elongated light reflector at each side of each door.

10. In a multiple-unit display assembly,
- a plurality of units connected in edge-to-edge relationship, each unit comprising
- a main frame having a projecting portion on each side thereof for face-to-face contact with an adjacent unit,
- said portion having a series of apertures therealong to receive supporting brackets for shelving,
- a translucent panel in said frame, and
- closure means pivoted to the rear of said frame, illuminating means carried by said closure means, and
- the space between adjacent units in front of said projecting portions being so narrow as to be substantially unnoticeable to an observer and yet permit the entrance of thin supporting brackets.

* * * * *