May 21, 1946. W. A. SHEARER 2,400,608

MULTIPLE HINGE STRUCTURE

Filed Sept. 25, 1943

FIG. 1

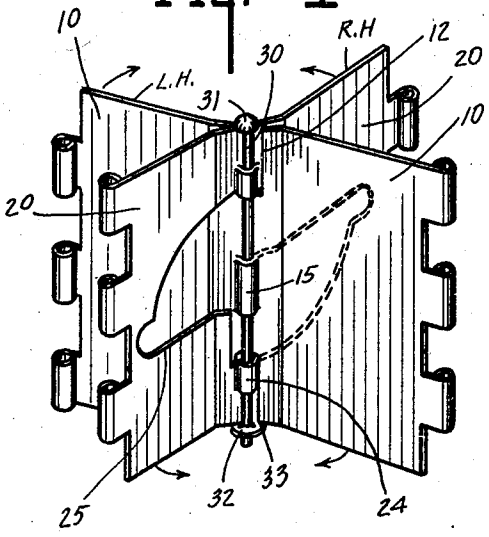



FIG. 2

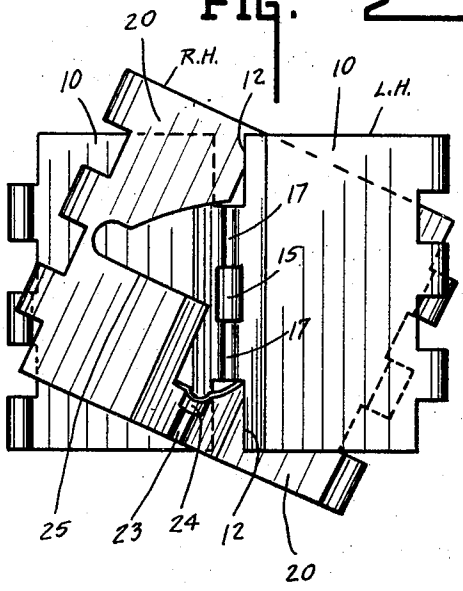
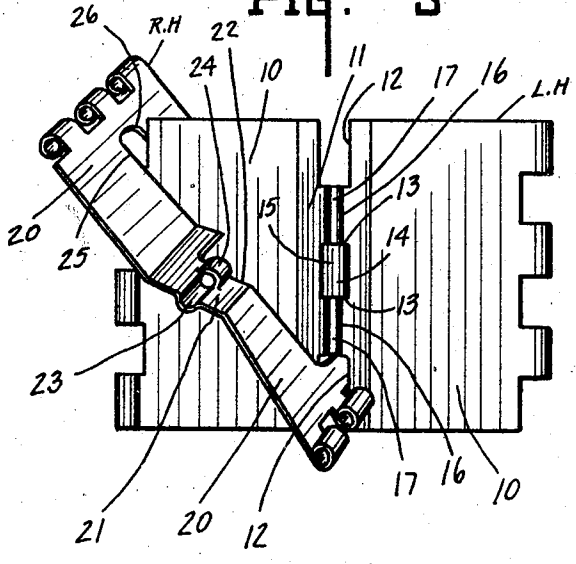



FIG. 3




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## MULTIPLE HINGE STRUCTURE

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Application September 25, 1943, Serial No. 503,752

2 Claims. (Cl. 16—162)

This invention relates to a multiple leaf, multiple hinge, single pivot structure capable of use in chairs, foldable closures, railings, and other articles of a collapsible and extensible type.

The chief object of this invention is to provide a structure of the aforesaid character and wherein the hinges are of interlocking character, that is one leaf passes through the other and the leaves when collapsed or extended have self included stops for limiting such movements.

The chief feature of the invention resides in the location of the leaf passage, stops and leaf connections at the center of the leaves.

The leaf can be of metal, alloy, plastic, or the like, as desired or required. When of sheet metal much lighter gauges may be utilized than are required for use in conventional hinges.

Other objects and features of the invention will be set forth more fully hereinafter.

The full nature of the invention will be understood from the accompanying drawing and the following description and claims.

In the drawing:

Fig. 1 is a perspective view of a pair of hinge leaves having a common pintle connection for the resulting four wings.

Fig. 2 is a similar view of the two leaves in a partially separated relation.

Fig. 3 is a similar view of the same in a further separated relation.

In the drawing there is illustrated a pair of hinge plates, one designated RH or right hand and the other designated LH or left hand. Since these plates are individually illustrated to a greater degree in Fig. 3 reference will be had thereto.

The left hand plate includes two leaf portions 10 which lie parallel and offset to each other being connected by the biased or inclined portion 11 which at opposite ends is notched out as at 12. The intermediate portion is slit as at 13 which between the roots of notches 12 herein forms three connectors between the leaves.

The central connector 14 is formed into a substantially semi-cylindrical bearing 15 and the other connectors 16 are similarly formed except that these bearings 17 therein are oppositely directed to the bearing 15 and thus a pintle is retainable by the semi-cylindrical bearings of the left hand plate.

The right hand plate includes two leaf portions 20 which lie parallel and offset to each other being connected by the biased portion 21 which is cut out at 22 to form a central opening to seat the aligned pintle receiving bearing portions 15 and 17 of the left hand leaf. The biased portion 21 at each end includes two oppositely directed substantially semi-cylindrical elongated portions 23 and 24, so that the right hand plate is capable of fully retaining a pintle by its semi-cylindrical bearings.

Each leaf 20 includes a triangular extension 25 of opening 22 and same terminates in a semi-circular end 26.

In mounting the two plates together the one plate (LH) is passed half through the opening 22 and elongations 25—26 as illustrated in Fig. 3. This initial entrance is effected by notch 12 properly associating with opening 26 so the remote diagonally opposite corner of leaf 10 can pass through the opposite opening 26.

When the two plates are approximately transverse to each other, the plate (LH) can be turned so that notches 12 follow the hypothenuse of openings 25 in plate RH until the several bearings are aligned in said plates. Note this turning can only be in one direction relatively.

Then a pintle 30 with head 31 is passed through the aligned bearing and a friction locking, double tongue washer 32 with pintle gripping tongue 33 is applied to hold the same in place.

To disassemble the hinge unit the washer and pintle are successively removed, the plate LH is turned approximately 90°, following the aforesaid hypothenuse of opening 25 and then that plate is tilted in that plane to pass the plate from the right hand plate.

These hinges may be suitably connected to other elements by any suitable means. They may be pivotally connected to other hinge elements or other identical units. Herein opposite leaves of the same plate at opposite edges have curled extensions E forming pintle bearings, three to each side edge, one edge being devoid thereof at one end and the opposite edge being devoid thereof at the diagonally opposite end as illustrated. These extensions of adjacent units, when aligned, receive pintles similar to 30, etc. and thus an articulated series of units may be assembled together.

The plates are shown in Fig. 1 as having their biased portions crossed and nearly abutting thus forming a stop. Fig. 1 represents the parts in extended position. When the two rearward laaves, Fig. 1, are caused to move towards each other as shown by the arrows the forward leaves have similar movement and this movement may be continued until the leaves contact each other, if desired. This is the fully collapsed position. Plates of this character can be stamped from

sheet material such as metal plate, etc. as initially described herein.

While the invention has been illustrated and described in great detail in the drawing and foregoing description, the same is to be considered as illustrative and not restrictive in character.

The invention claimed is:

1. In combination a pair of plates each including oppositely directed wing or leaf portions, one of said plates, between the leaves at opposite edges having inwardly directed notches, and pivot bearing portions therebetween, and all in longitudinal alignment, the other of said plates having a central elongated opening between the leaves thereof for accommodation of the pivot bearing portions of the first mentioned plate, and lateral extensions of said opening, in each of the wing or leaf portions of the second mentioned plate to facilitate plate association into and disassociation from intersecting position, the second mentioned plate in longitudinal alignment with the opening and between the leaves thereof including pivot bearing portions, alignable with the same of the first mentioned plate, and pintle means associated with said pivot bearing portions.

2. In combination a pair of plates each including oppositely directed wing or leaf portions, one of said plates, between the leaves at opposite edges having inwardly directed notches, and pivot bearing portions therebetween, and all in longitudinal alignment, the other of said plates having a central elongated opening between the leaves thereof for accommodation of the pivot bearing portions of the first mentioned plate, and lateral extensions of said opening, in each of the wing or leaf portions of the second mentioned plate to facilitate plate association into and disassociation from intersecting position, the second mentioned plate in longitudinal alignment with the opening and between the leaves thereof including pivot bearing portions, alignable with the same of the first mentioned plate, and pintle means associated with said pivot bearing portions, each plate between the leaves thereof including a biased portion including the said pivot bearing portions.

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