

[54] **HINGE STRUCTURE**

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 [58] Field of Search 16/168, 169; 220/31 SR;
 49/449; 292/57

[56] **References Cited**

UNITED STATES PATENTS
 1,270,076 6/1918 Waitt 16/169

2,146,142 2/1939 Heasley 292/57

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[57] **ABSTRACT**

A hinge structure includes a pivot pin element having an elongated pivot portion and is axially insertable into a hinge pin hole formed in one of a pair of hinged members. The pivot pin element further includes a radially larger head portion that is engageable with one of the hinged members upon rotation of the pivot pin element for preventing axial movement of the pivot pin element from the operative position.

2 Claims, 5 Drawing Figures

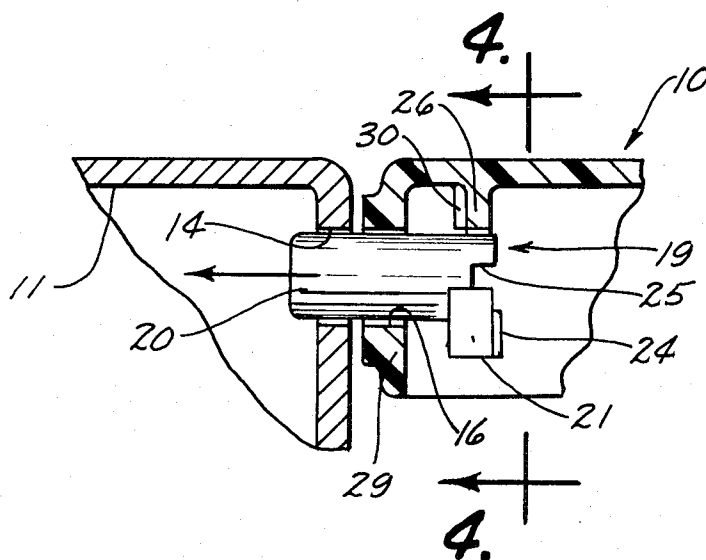


Fig. 1

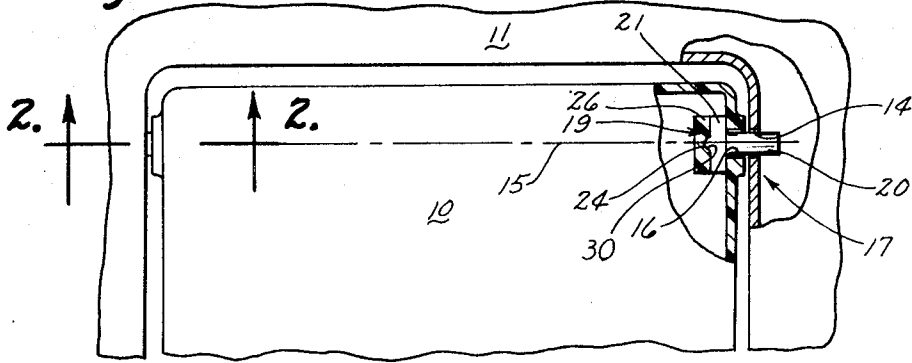


Fig. 2

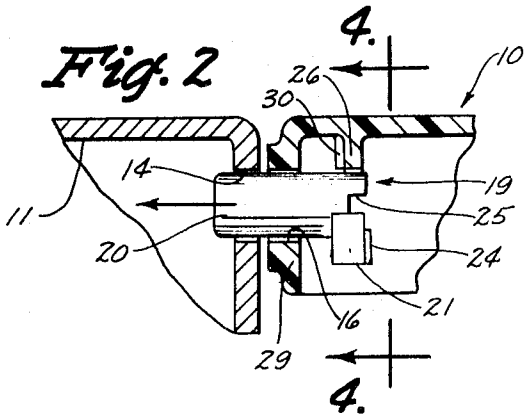


Fig. 3

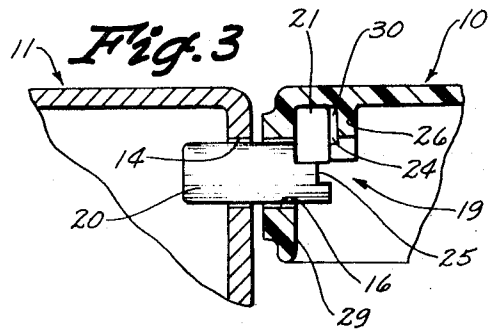


Fig. 4

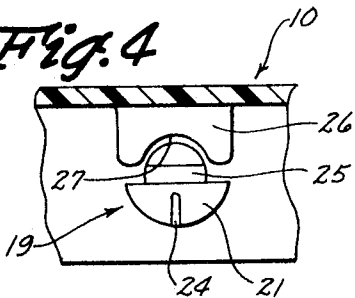
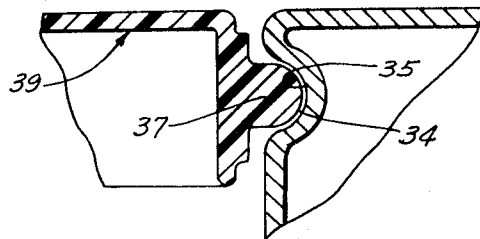


Fig. 5



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HINGE STRUCTURE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a hinge structure and more particularly to a loose hinge pin element axially insertable to an assembly position and rotatably movable to a detented operative position pivotally engageable with a pair of hinged members.

2. Description of the Prior Art

There is a continuing search for an inexpensive hinge construction permitting relatively easy assembly of the hinge while insuring effective and satisfactory long life operation. Previous patents, including U.S. Pat. No. 3,408,685, issued to T. B. Anthony, and assigned to the assignee of the instant invention, and also U.S. Pat. No. 2,660,273 issued to J. P. Rogers, disclose hinge structures related to the instant invention. Each of these prior constructions, however, require auxiliary insertable members for operatively retaining the hinge pivot element or the hinged member in operative position.

SUMMARY OF THE INVENTION

It is an object of this invention to provide an improved hinge structure having a novel insertable hinge pin element for operatively connecting a pair of hinged members.

It is a further object of this invention to provide an improved hinge structure having a separate hinge pin element axially insertable and rotatable to a detented operative position for interconnecting a pair of hinged members.

The instant invention achieves the above objectives in a hinge structure that pivotally joins a pair of hinged members, at least one of which includes a hinge pin hole at the pivot axis. A hinge pin element is axially insertable into the pivot hole and is pivotally engageable with the pair of hinged elements. The hinge pin is then rotatably movable relative to the hinged members for retaining the hinge pin element and effectively preventing axial or rotatable movement of the hinge pin from the operative position. Operation of the hinge structure and other objects and advantages thereof will become evident as the description proceeds and from an examination of the accompanying page of drawings.

DESCRIPTION OF THE DRAWINGS

The drawings illustrate a preferred embodiment of the invention with similar numerals referring to similar parts throughout the several views, wherein:

FIG. 1 shows an overall view of the hinge structure for pivotally joining a pair of hinged members;

FIG. 2 is an enlarged sectional view of one of the hinges as taken along line 2—2 of FIG. 1 and showing the loose hinge pin element at an intermediate stage of assembly;

FIG. 3 is a view similar to that shown in FIG. 2 and showing the hinge pin element in fully assembled detented position;

FIG. 4 is a fragmentary sectional view showing the end of the hinge pin element as taken substantially along line 4—4 of FIG. 2; and

FIG. 5 is a fragmentary sectional view of one hinge location showing an alternate hinge structure useful with the invention as shown in FIGS. 1 through 4.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1, there is shown a hinge structure for pivotally mounting a movable door or lid 10 on a relatively stationary cabinet panel 11 as in a laundry appliance, for example. In the preferred embodiment, the cabinet panel 11 includes a pair of spaced-apart hinge pin holes, such as the hinge pin hole 14 positioned on the pivot axis 15. The lid 10 similarly includes a pair of spaced-apart hinge pin holes including hinge pin hole 16 aligned with and juxtaposed to the hinge pin hole 14 in the cabinet panel 11. This arrangement therefore provides at hinge location 17, for example, a pair of juxtaposed hinge portions including aligned hinge pin holes 14 and 16 adapted to receive an intermediate pivot element for completing the hinge structure.

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The pivot element pivotally connecting the lid 10 to the cabinet panel 11 at each of the hinge locations is in the form of a hinge pin element 19. As best shown in FIGS. 2 through 4, the hinge pin element 19 includes an elongated cylindrical pivot portion 20 insertable into the hinge pin holes 14 and 16 at the pivot axis 15. The hinge pin element 19 also includes a head portion 21 in the form of a flange that extends radially outwardly from the pivot surface of the pivot portion 20 and is substantially semi-circular as in FIG. 4. Located on the head portion 21 is a raised rib 24 operable as a detent member as will be more fully explained hereinafter. Also forming a part of the hinge pin element 19 is a slot 25 adapted to receive a tool, such as a screwdriver, for rotating the hinge pin element 19 from an intermediate position as generally indicated in FIG. 2 to the operative position as best shown in FIG. 3.

Referring still to FIGS. 2 through 4, it is seen that one of the hinged members, the lid 10 in the embodiment shown, includes a depending retaining member 26 as in FIG. 2. The retaining member 26 includes an arcuate recessed 27, as shown in FIG. 4, to permit axial movement of the hinge pin element 19 into an assembly position. The spacing between the depending member 26 and the side flange 29 of the hinged lid 10 is sufficient to receive the head flange portion 21 of the hinge pin element 19 upon rotation of the hinge pin element 19 to the operative position as in FIG. 3.

The hinged lid 10 may be assembled to the cabinet panel 11 by means of a pair of the hinge pin elements as follows. The hinge pin element 19 is partially inserted into the hole 16 defined by the lid 10. Then, with the hinge pin element 19 aligned on the hinge axis 15, the elongated pivot portion 20 is axially moved into the hole 14 until the head portion 21 contacts the wall of the lid flange 29. The hinge pin element 19 is then rotated, with the use of a screwdriver positioned in the slot 25, to locate the semi-circular head portion 21 between the lid flange 29 and the depending retainer 26. The raised detent 24 on the end of the head portion 21 moves into recess 30 formed in the depending retainer 26, as best shown in FIGS. 1 and 3 and retains the hinge pin element 19 in the operative position.

Though the embodiment in the drawings shown the hinge element 19 as being insertable from the lid side of each hinge location, it is of course possible that the adjacent cooperating hinge portions be revised so that the hinge pin element 19 is insertable from the cabinet panel side of the hinge. This particular reversal of elements would offer advantages from the standpoint of preventing tampering of the lid hinge pin elements.

Referring to FIG. 5, there is shown an alternate construction for use with a hinge construction as shown in FIGS. 1 through 4. FIG. 5 actually shows two alternate features that can be independently combined with the instant invention. First, the hinge pin element may include a spherical surface 34 at the end of the elongated portion engageable with a depression 35 in the cooperating hinged member rather than passing through a hinge pin hole in the cabinet panel as shown in the previous figures. The hinge pin element would be inserted through a hole in the lid as in FIGS. 1—4.

Further, FIG. 5 shows an integrally formed hinge element 37 that could be used at one side of a lid 39 that used a loose hinge pin at only one side. In such a construction, the integral hinge projection 37 could be positioned either into a depression 35 as shown in FIG. 5 or into a pivot hole as shown in the other figures. A separate hinge pin element embodying the features of the instant invention could then be axially inserted at the other hinge location and rotatively moved into the operative position as shown in FIG. 3.

It is therefore seen that the instant invention provides an improved hinge structure that utilizes a separate hinge pin element insertable between a pair of members by an improved installation and retention system. The construction provides for an economical hinge easily assembled and disassembled.

In the drawings and specification, there has been set forth a preferred embodiment of the invention, and although specific terms are employed, these are used in a generic and descrip-

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tive sense only, and not for purposes of limitation. Changes in form and the proportion of parts, as well as the substitution of equivalents are contemplated, as circumstances may suggest or render expedient, without departing from the spirit or scope of this invention as further defined in the following claims.

I claim:

1. A hinge structure for pivotally connecting first and second members at a pivot axis, comprising: a first hinge portion attached to said first member; a second hinge portion attached to said second member and located in aligned juxtaposition to said first hinge portion at said pivot axis, said first hinge portion comprising a wall substantially normal to said pivot axis and defining a hinge pin hole penetrating said wall; a pivot element axially insertable into said hinge pin hole and rotatable to an operative position for pivotally connecting said first and second hinge portions; a flange portion connected to and extending radially outwardly from a partial circumference of said pivot element at one end thereof; and a retaining

member on said first member axially spaced from and generally parallel to said wall and extending toward the pivot member to at least partially overlap the radial extent of said flange portion, said flange portion being rotatable to an operative position abutting said wall portion adjacent said hinge pin hole and said retaining member with detent means therebetween for maintaining said pivot element in said operative position.

2. A hinge structure as defined in claim 1 wherein said pivot element includes an elongated portion axially insertable into said hinge pin hole, said retaining member includes an arcuate recess to permit axial insertion of said pivot element and wherein said flange portion extends radially outwardly from circumferentially less than half of said pivot element and is rotatable into a position between said wall portion and said retaining member for axially retaining said pivot element in said operative position.

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