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2,546,590

HINGE STRUCTURE

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Fig. 1.

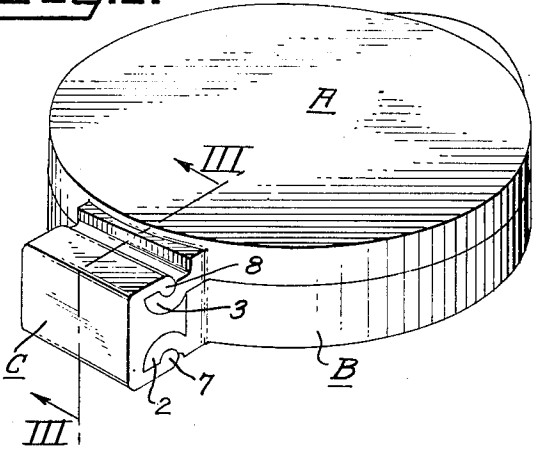


Fig. 2.

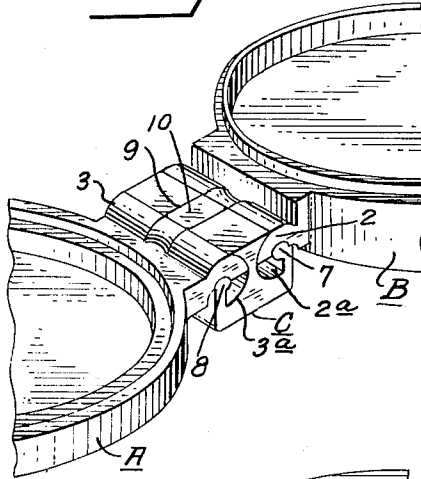


Fig. 3.

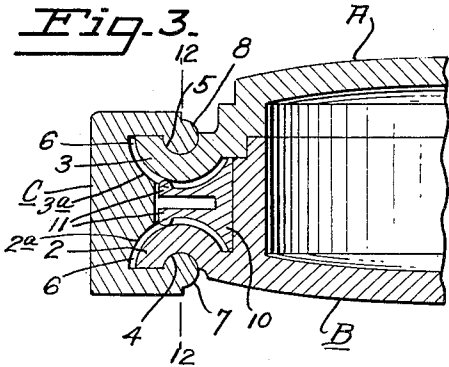


Fig. 4.

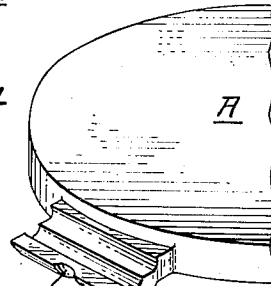


Fig. 6.

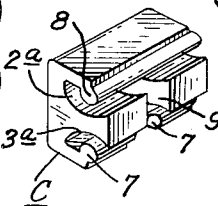
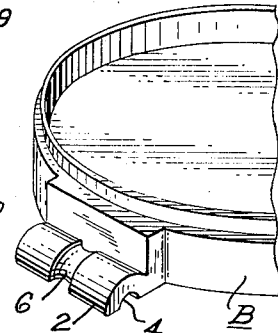


Fig. 7.



Fig. 5.



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HINGE STRUCTURE

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4 Claims. (Cl. 16—128)

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This invention relates to a hinge structure, which is adapted to be formed by moulding or die casting operations from different types of plastics and metals.

The object of the present invention is generally to improve and simplify the construction and operation of hinge structures; to provide a hinge which may be formed from plastics or metals and the like by moulding or die casting operations; to provide a hinge a portion of which may be formed integral with two members which are to be hingedly connected; to provide a moulded extruded or die cast hinge which requires no machining or finishing after being moulded or die cast; to provide a hinge which is quickly and readily assembled; to provide a hinge having an insertable keeper which prevents disassembly or accidental separation of the hinge parts after assembly, and further to provide a hinge which closes with a snap like action and in which a resilient member resists opening of the hinged parts.

The hinge structure is shown by way of illustration in the accompanying drawings in which,

Fig. 1 is a perspective view of a compact case to which the hinge structure is applied.

Fig. 2 is a perspective view partially broken away showing the cover of the compact case in open position.

Fig. 3 is an enlarged cross-section taken on line III—III Fig. 1.

Fig. 4 is a perspective view partially broken away showing a portion of the cover section and the hinge lug formed integral therewith.

Fig. 5 is a perspective view similar to Fig. 4 showing a portion of the body of the case and the hinge lug formed integral therewith.

Fig. 6 is a perspective view of the connector, and

Fig. 7 is a perspective view of the keeper.

Referring to the drawings in detail and particularly Figs. 1 and 2 A indicates the cover, B the body or container portion of a compact case or the like and C a connector whereby the cover and body portion are hingedly connected. In the present instance the cover and body of the compact case are shown as being cylindrical shape, but these members may obviously be square, rectangular, hexagonal or otherwise shaped.

Formed integral with the body portion B of the case is an elongated lug 2 which is arcuate in cross-section and formed on the cover A of the case is an elongated lug 3 which is of similar shape. The lug on the cover faces upwardly while the lug on the body portion faces down-

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wardly. Each lug is grooved from end to end as indicated at 4 and 5 respectively and each lug is also provided with a groove 6 which is disposed at right angles to the grooves 4 and 5.

The lugs 2 and 3 form hinge lugs which are free to swing about respective pintle pins or lugs 7 and 8 forming a part of the connector generally indicated at C. The connector is of the same length as the hinge lugs 2 and 3. It has two grooves formed therein as indicated 2^a and 3^a, these grooves have a cross-sectional shape of the hinge lugs. The grooves are provided for the reception of the lugs as will hereinafter be described and a cut out portion 9 is formed in the connector to receive a keeper generally indicated at 10 (see Fig. 7). The keeper is provided with two resilient spring like legs 11. The keeper serves two main functions first, that of retaining the hinge lugs 2 and 3 from end-wise movement with relation to the connector and secondly, that of a spring which tends to retain the cover in closed position and causes the cover to close with a snap like action.

The hinge structure as a whole is particularly intended for use in connection with compact cases and like containers which are made from plastic or metallic materials by moulding, die casting or the like. The hinge lugs 2 and 3 are as previously stated formed integral with the cover and body portion of the case while the connector C and the keeper 10 are separately formed by the same method. If the compact case is made from plastics or metals of a suitable character by moulding or die casting, no machining or finishing of the parts after removal from the moulds or dies is required, thus the parts are ready for assembly when required and this is accomplished as follows.

The cover and body portions are placed in a horizontal position on a table or any suitable support as shown in Fig. 2, the connector is then grasped and slid endwise between them, thus causing the hinge lugs 2 and 3 to enter the grooves 2^a and 3^a formed for their reception. After the connector has been applied the keeper 10 is inserted in the opening 9 and when so inserted secures all parts against separation, that is, the inner ends of the resilient legs of the keeper enter the grooves 6 of the hinge lugs 2 and 3 as shown in Fig. 3 and as such secures the hinge lugs against endwise removal from the connector, also it will be noted that the resilient legs are of such length that they extend beyond a center line indicated at 12—12 which is drawn thru the pintle lugs (see Fig. 3). The resilient legs of the

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keeper are partially compressed or brought together when inserted in the opening 9 and as they extend beyond the center line 12—12 it is obvious that the keeper itself is retained against removal and that the legs of the keeper exert a pressure on the hinge lugs 2 and 3 at points beyond the center of swinging movement about the pintle lugs, thus tending to retain the cover in closed position and also causing the cover to close with a snap like action.

With a hinge structure of this character it is possible for the cover to swing 90 degrees with relation to its pintle lug, and it is also possible for the body to swing about the other pintle lug a distance of 90 degrees, hence a total swinging movement of 180 degrees is obtainable by the cover and body, or 90 degrees for each so that the cover may assume the position shown in Fig. 2.

The hinge structure as a whole is simple and substantial in construction; the only parts required being the connector C, the keeper 10, and the hinge lugs which are formed on the cover and body portions respectively, and as all parts required may be formed by moulding or die casting many different types of plastics and metals may be employed, and while this and other features of the invention have been more or less specifically illustrated and described, it should be understood that changes may be resorted to within the scope of the appended claim and that the materials and finish of the several parts employed may be such as the experience or judgement of the manufacturer may dictate or varying conditions or uses may demand.

If the connector shown in Fig. 6 is made of certain types of plastic material the keeper 10 and the pocket 9 made for its reception may be eliminated as when the plastic material comes out of the mold or the extruder it is so soft or plastic that if pressure is applied at the point C see Fig. 3 a portion of the plastic material is forced into the grooves 6 of the hinges 3 and 4 thus permanently securing the connector against removal from the hinge lugs or vice versa.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A hinge for pivotally connecting two members comprising an elongated hinge connector having two, spaced, parallel, grooves semi-circular in cross sectional contour formed therein and extending longitudinally thereof in side by side relationship from end to end thereof with their concave sides facing oppositely outwardly, a pair of pintle pins integral with said connector and respectively spaced from the open side of each groove and extending parallel therewith, the side of each pintle pin being convexly curved in cross sectional contour on its side facing the groove adjacent thereto about the same radius as that of said groove, an elongated lug extending outwardly from each member to be connected having a cross sectional contour corresponding on two opposite sides with the concave and convex cross sectional contour respectively of each of said grooves and the pintle pin adjacent thereto for sliding of said lugs endwise into the space between said pintle pins and the groove adjacent thereto from one of the ends of each groove, and means releasable from said connector for securing said lugs against endwise removal from said grooves after their insertion into the latter.

2. A hinge for pivotally connecting two members comprising an elongated hinge connector having two, spaced, parallel, grooves semi-circular in cross sectional contour formed therein and

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extending longitudinally thereof in side by side relationship from end to end thereof with their concave sides facing oppositely outwardly, a pair of pintle pins integral with said connector and respectively spaced from the open side of each groove and extending parallel therewith, the side of each pintle pin being convexly curved in cross sectional contour on its side facing the groove adjacent thereto about the same radius as that of said groove, an elongated lug extending outwardly from each member to be connected having a cross sectional contour corresponding on two opposite sides with the concave and convex cross sectional contour respectively of each of said grooves and the pintle pin adjacent thereto for sliding of said lugs endwise into the space between said pintle pins and the groove adjacent thereto from one of the ends of each groove, transverse grooves respectively formed in the outer sides of said lugs at a corresponding point intermediate their ends, a recess formed in said connector between said grooves and at a point adjacent the position of said transverse grooves when said lugs are in said semi-circular grooves, a keeper removably secured in said recess and extending into the said transverse grooves for securing said lugs against endwise removal from said connector.

3. A hinge for pivotally connecting two members comprising an elongated hinge connector having two, spaced, parallel, grooves semi-circular in cross sectional contour formed therein and extending longitudinally thereof in side by side relationship from end to end thereof with their concave sides facing oppositely outwardly, a pair of pintle pins integral with said connector and respectively spaced from the open side of each groove and extending parallel therewith, the side of each pintle pin being convexly curved in cross sectional contour on its side facing the groove adjacent thereto about the same radius as that of said groove, an elongated lug extending outwardly from each member to be connected having a cross sectional contour corresponding on two opposite sides with the concave and convex cross sectional contour respectively of each of said grooves and the pintle pin adjacent thereto for sliding of said lugs endwise into the space between said pintle pins and the groove adjacent thereto from one of the ends of each groove, transverse grooves respectively formed in the outer sides of said lugs at a corresponding point intermediate their ends, a recess formed in said connector between said grooves and at a point adjacent the position of said transverse grooves when said lugs are in said semi-circular grooves, a keeper removably secured in said recess and extending into the said transverse grooves, for securing said lugs against endwise removal from said connector, said keeper including a pair of spaced legs of resilient material respectively adapted to yieldably engage said lugs in said transverse grooves against accidental removal from said transverse grooves.

4. A hinge for pivotally connecting two members comprising an elongated hinge connector having two, spaced, parallel, grooves semi-circular in cross sectional contour formed therein and extending longitudinally thereof in side by side relationship from end to end thereof with their concave sides facing oppositely outwardly, a pair of pintle pins integral with said connector and respectively spaced from the open side of each groove and extending parallel therewith, the side of each pintle pin being convexly curved in

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cross sectional contour on its side facing the groove adjacent thereto about the same radius as that of said groove, an elongated lug extending outwardly from each member to be connected having a cross sectional contour corresponding on two opposite sides with the concave and convex cross sectional contour respectively of each of said grooves and the pintle pin adjacent thereto for sliding of said lugs endwise into the space between said pintle pins and the groove adjacent thereto from one of the ends of each groove, a spring keeper extending into said connector between said semi-circular grooves and

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projecting into said grooves for resilient frictional engagement with the said lugs when the latter are in said grooves thereby tending to hold said lugs against removal from said grooves.

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The following references are of record in the file of this patent:

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