June 23, 1970 E. F. JOYCE 3RD 3,516,114

HINGE

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Fig. 1.

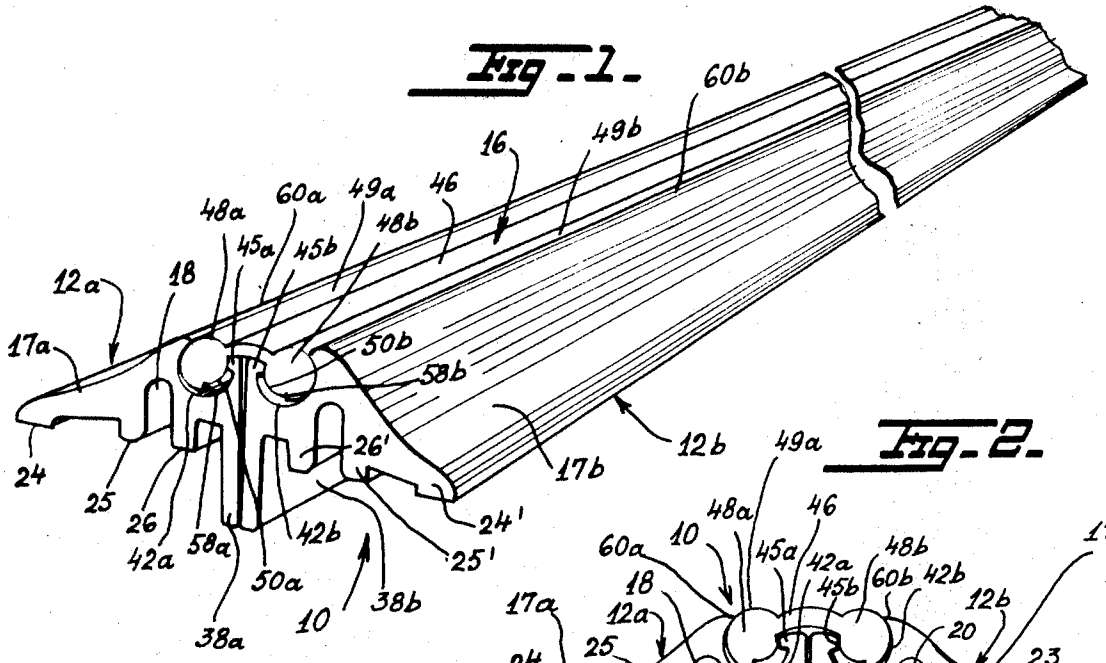


Fig. 2.

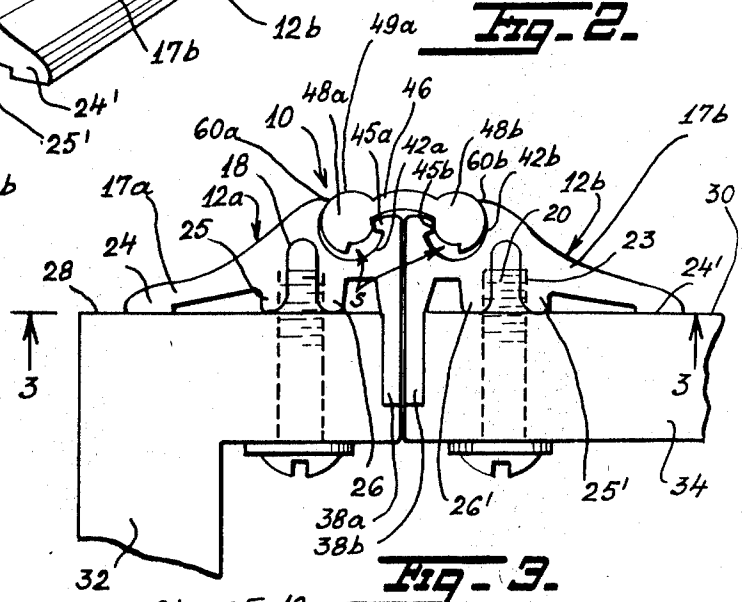


Fig. 4.

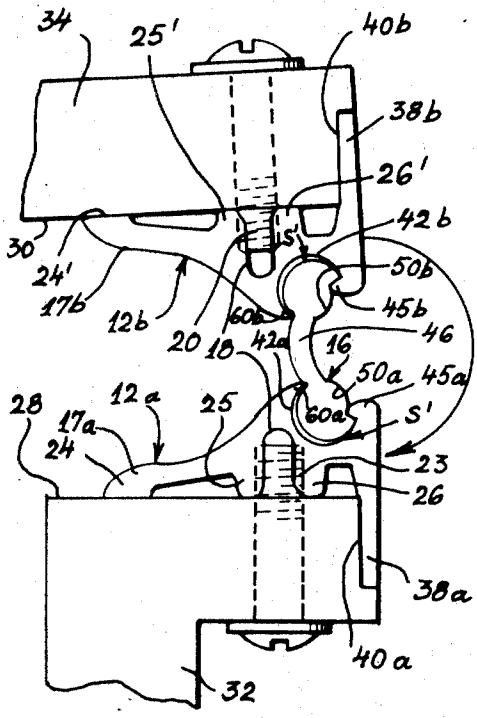
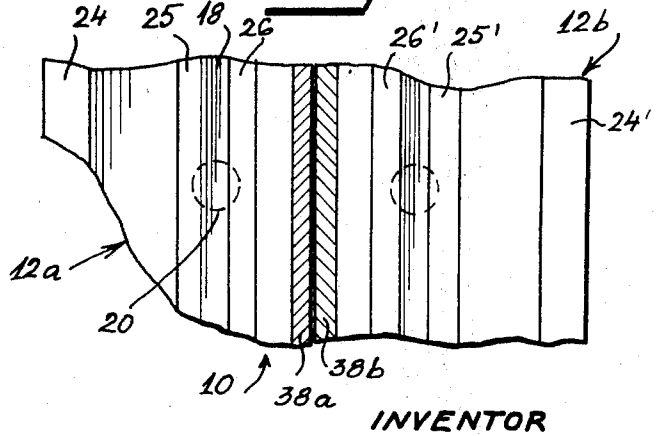


Fig. 3.



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Fig. 6.

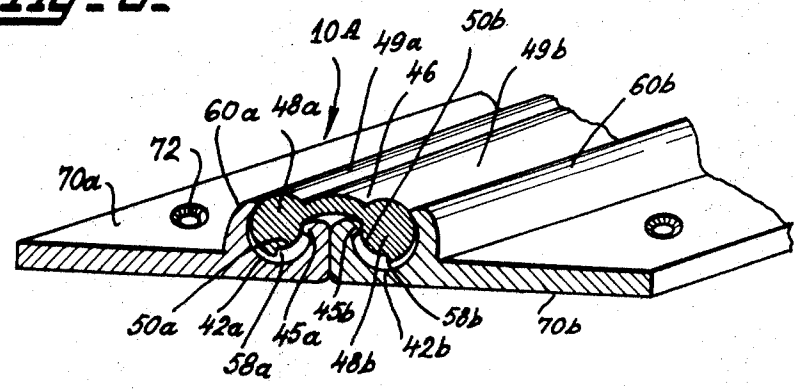
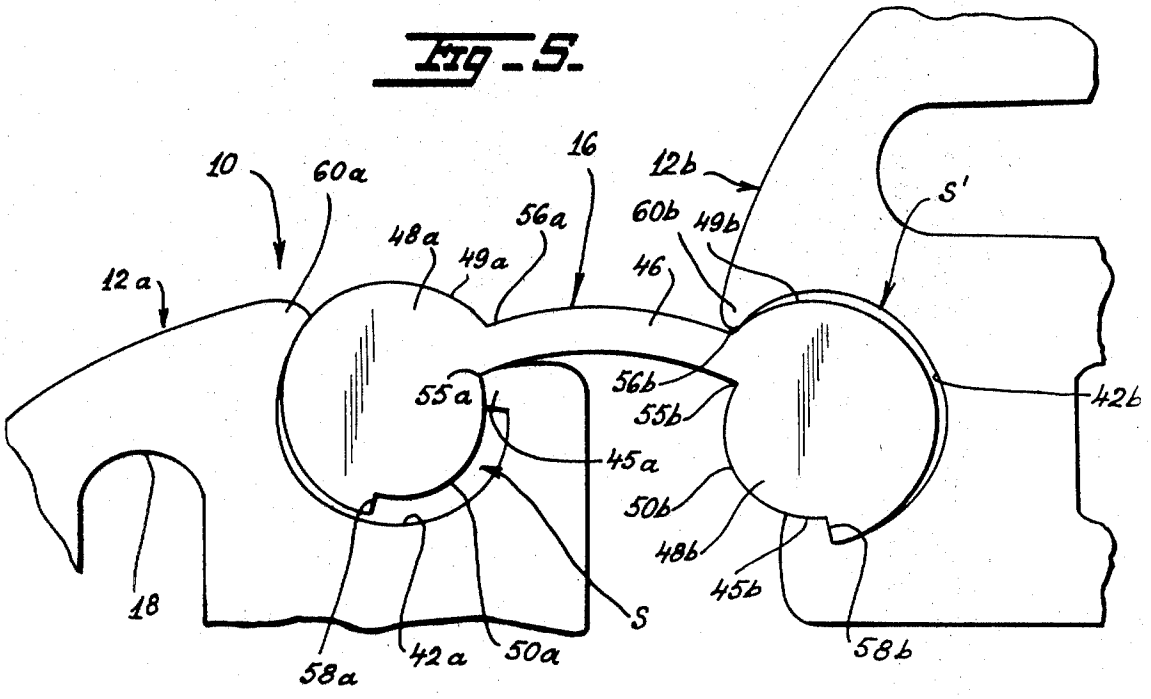


Fig. 5.



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HINGE

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U.S. Cl. 16—150 8 Claims

ABSTRACT OF THE DISCLOSURE

A hinge assembly has a bridge type pintle formed with cylindrical edges having two radii of curvature to define radial abutments. The edges of the pintle rotate in cylindrically curved sockets of hinge members. The sockets are formed with radial abutments. When the hinge is closed opposite edges of the sockets engage edges of the pintle. When the hinge is opened, abutments of the pintle and hinge members engage in cooperation with engagement of edges of the hinge members with edges of the bridge of the pintle.

The present invention is directed at providing an improved hinge construction which more effectively joins lids of a cabinet, or many other applications.

In my prior Pat. No. 2,318,362, I have described a hinge for a chest-type cabinet which has a pair of hinge members joined by a pintle having cylindrical side edges engaged in cylindrical sockets in the hinge members. The pintle has a curved narrow bridge joining its two cylindrical edges. This bridge engages edges of the hinge sockets when the hinge is opened and closed respectively. If the lids of the chest joined by the hinge assembly do not fit properly, or if the hinge is subject to extreme strain on being open or closed, the hinge is liable to break at the bridge of the pintle.

A principal object of the invention is to provide an improved hinge having a bridge type pintle, wherein the pintle and hinge members have abutments to cooperate with the bridge in resisting strain on opening and closing.

A further object is to provide an improved hinge of the type described, wherein the hinge adapts and conforms more readily to poorly fitting lids, or other applications.

Another object is to provide an improved hinge as described, wherein there is greater play permitted between hinge members when the hinge is opened to allow for irregularities in cabinet structure.

A further object is to provide a hinge having a bridge type pintle wherein opposite edges of the pintle are not constrained to rotation on axes precisely parallel to axes of the sockets in which edges of the pintle are engaged.

Various objects, features and advantages of the invention will become apparent upon reading the following specification together with the accompanying drawing forming a part thereof.

Referring to the drawing:

FIG. 1 is a perspective view of a hinge assembly embodying the invention.

FIG. 2 is an end view of the hinge shown in closed position and engaged to a lid of a cabinet and to a wall of the cabinet, or other application.

FIG. 3 is a horizontal sectional view taken on line 4—4 of FIG. 2.

FIG. 4 is an end view of the hinge, lid and wall of the cabinet with lid and hinge shown in fully opened position.

FIG. 5 is an enlarged end view of parts of the hinge assembly in partially open position.

FIG. 6 is a perspective view, partially in section of another hinge assembly embodying the invention.

Referring first to FIGS. 1–5, there is shown a hinge assembly **10** having two hinge members **12***a*, **12***b* and

a pintle **16**. The hinge members have identical shapes and can be formed as extrusions of aluminum, plastic or other suitable materials. The pintle has a symmetrical shape and can also be formed as a metal or plastic extrusion of any desired length.

Each hinge member has a flange **17***a* or **17***b* with a channel **18** on its underside which can receive threaded shanks of screws **20**, **22** (see FIGS. 2–4). The screws can be inserted in tapped holes **23** or can be of self-tapping type to tap their own holes. Ridges **24**, **25** and **26** and **24'**, **25'** and **26'** of the hinge members bear on and frictionally engage upper surfaces **28**, **30** of the cabinet wall **32** and lid **34**, respectively. Facing lateral flanges **38***a*, **38***b* of the hinge members engage in recesses **40***a*, **40***b* formed in facing edges of the wall **32** and lid **34**. Generally cylindrical sockets **42***a*, **42***b* are formed in outer sides of the hinge members. The sockets extend circumferentially more than 180° and at their inner edges are formed with rails **45***a*, **45***b* defining radial abutments.

The pintle **16** has an arcuate bridge **46**. Opposite edges of the bridge are integrally with lateral cylindrical ridges **48***a*, **48***b* of the pintle. Each pintle edge has a major cylindrical portion **49***a* or **49***b* of greater radius of curvature and a minor cylindrical portion **50***a* or **50***b* of smaller radius of curvature. The major cylindrical portions extend more than 180° while the minor portions extend about 120° (see FIG. 5). The remaining circumferential extent of the ridges **48***a*, **48***b* is occupied by the ends of the bridge **46**. Inner corners **55***a*, **55***b* of the bridge coincide with inner edges of cylindrical portions **50***a*, **50***b*. Outer corners **56***a*, **56***b* of the bridge coincide with outer edges of cylindrical portions **49***a*, **49***b*. Radial abutments **58***a*, **58***b* are defined at steps between the major and minor cylindrical portions of the pintle ridges **48***a*, **48***b*.

When the pintle is closed with respect to the hinge members, as shown in FIGS. 1, 2, and 3 and at the left hinge member **12***a* in FIG. 5, the pintle is held in sockets **42***a*, **42***b* by engagement of outer socket edges **60***a*, **60***b* with major cylindrical portions **49***a*, **49***b* while rails **45***a*, **45***b* engage the inner cylindrical portions **50***a*, **50***b* at bridge **46**. A space S extends circumferentially between the ridges of the pintle and the inner walls of the sockets because the radii of the socket are greater than those of the ridges so that a certain amount of play is permitted between the pintle and hinge members. This permits the hinge members to conform to a cabinet and lid or other application whose upper surfaces **28**, **30** are not coplanar and may be somewhat skewed with respect to each other. This contrasts with the hinge construction referred to in my prior Pat. 2,318,362 in which the hinge accommodates to wall and lid surfaces which are parallel and slightly offset, but wherein the hinge will not accommodate to wall and lid surfaces slightly skewed to each other.

When the hinge assembly is fully opened as shown in FIG. 4 and at the right hinge member **12***b* of FIG. 5, edges **60***a*, **60***b* of the hinge members engage at corners **49***a*, **49***b* of the bridge **46** while rails **45***a*, **45***b* of the hinge members engage at radial abutments **58***a*, **58***b* of the pintle ridges. The strain at the bridge **46** is relieved and reduced by the cooperating engagement of the rails and abutments, as clearly shown in FIG. 4. This contrasts with the hinge construction of my prior patent where the corner joints of the bridge bear the full strain of a fully opened lid, so that the hinge is subject to breakage at the bridge. Circumferential space S' accommodates the hinge to warped or skewed lids.

FIG. 6 shows a hinge assembly **10A** which has the same basic construction as hinge assembly **10** and corresponding parts are identically numbered. In assembly **10A** the flanges **70***a*, **70***b* of the hinge members **12***a*, **12***b*

are flat and may be provided with countersunk holes **72** to receive screws for mounting on a flat cabinet wall and lid, respectively. Operation of the hinge member in closed and open positions is the same as described in connection with hinge assembly **10**.

The hinge assemblies **10** and **10A** will bear greater lid weights and will withstand rougher handling than my prior hinge assembly. At the same time, the benefits of economy of manufacture and ease of assembly are retained.

In assembling the hinges, the pintle ridges **48***a*, **48***b* are slid longitudinally into the sockets. Permanent locking of the hinge members and pintles against relative longitudinal movement can be effected by forming recesses (not shown) in the pintle edges and upsetting adjoining edges of the sockets in the same manner as described in my prior patent.

What is claimed is:

1. A hinge assembly adapted for pivotally joining to a lid or cabinet wall or any two objects to be hinged, comprising a first elongated hinge member having a first flange adapted for connection to a surface of said wall, said hinge member having a first cylindrical socket extending the full length of said member, said socket being open laterally and extending circumferentially more than 180° but less than 360°, said socket having a first rail extending radially inward thereof at one edge of the socket; a second elongated hinge member; a second flange adapted for connection to a surface of said lid, said second hinge member having a second rail extending radially inward thereof at one edge of the second socket, said members having lateral sides facing each other when the hinge members are in open position; and a pintle coupling the two hinge members, said pintle having generally cylindrical ridges at opposite lateral edges and an arcuate center longitudinally extending bridge integrally joining the ridges, each ridge having a major cylindrical portion of greater radius of curvature extending the full length of he pintle and extending circumferentially more than 180°, each ridge having a minor cylindrical portion of smaller radius of curvature extending the full length of the pintle and extending circumferentially less than 180°, so that a radial abutment is defined between the minor and major cylindrical portions, said ridges being rotatably engaged in the first and second sockets, respectively, whereby when the hinge members are in fully open position the rails of the hinge members engage opposite inner corners of the bridge at said minor cylindrical portions of the ridges while outer corners of the bridge at said major cylindrical portions of the ridges engage at other edges of the sockets.

2. A hinge assembly as defined in claim **1**, wherein the radius of curvature of each socket is greater than the radii of curvature of the ridges so that a circumferentially extending space exists between the ridges and sockets in both open and closed positions of the hinge members to permit the hinge members to accommodate to irregularities in the surfaces of the wall and lid.

3. A hinge assembly as defined in claim **1**, wherein each flange has a plurality of other ridges formed at one side thereof for frictionally engaging on the surfaces of said wall and lid.

4. A hinge assembly as defined in claim **3**, wherein the radius of curvature of each socket is greater than the radii of curvature of the ridges so that a circumferentially extending space exists between the ridges and sockets in both open and closed positions of the hinge members to permit the hinge members to accommodate to irregularities in the surfaces of the wall and lid.

5. A hinge assembly as defined in claim **1**, wherein each flange has a flat side for abutting substantially parallel surfaces of the wall and lid.

6. A hinge assembly as defined in claim **1**, wherein each of the hinge members and said pintle are formed as continuous extrusions of indefinite length.

7. A hinge assembly as defined in claim **6**, wherein said hinge members and said pintle are made of metal.

8. A hinge assembly as defined in claim **3**, wherein each of the hinge members and said pintle are formed at continuous metal extrusions of indefinite length.

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U.S. Cl. X.R.

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