

Nov. 24, 1942.

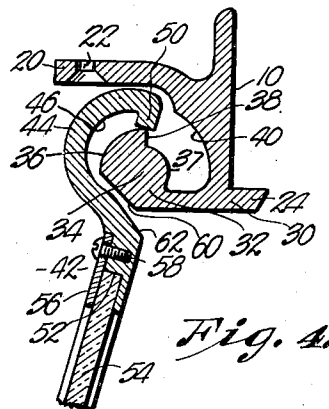
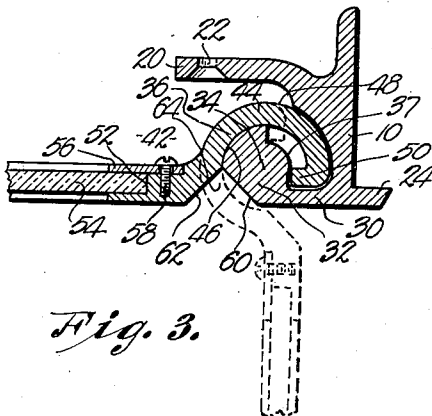
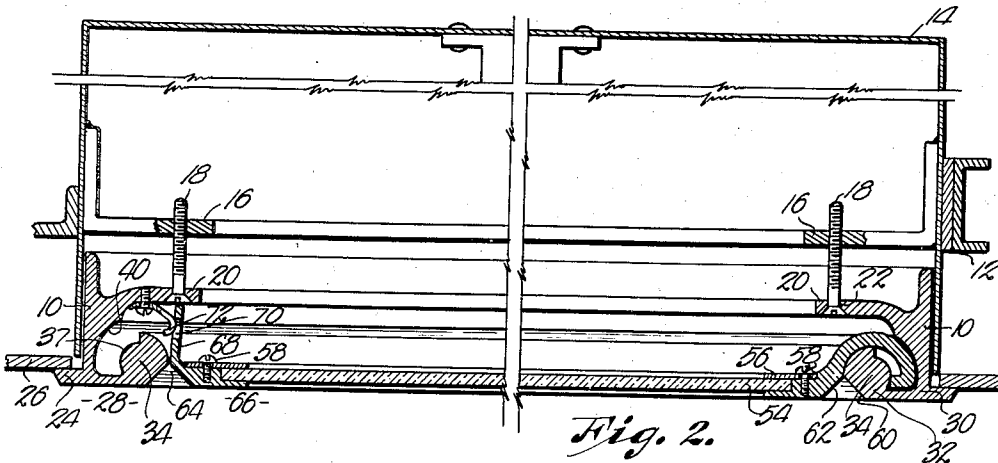
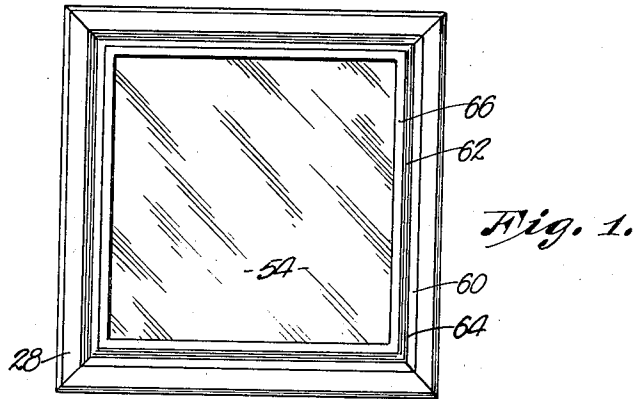
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2,302,661

HINGE

Filed June 21, 1940

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

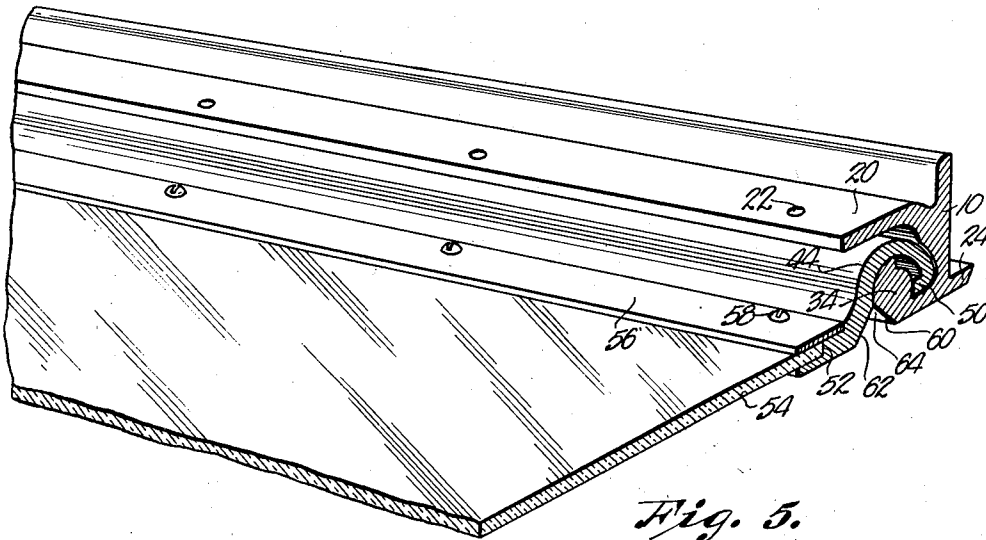


Fig. 5.

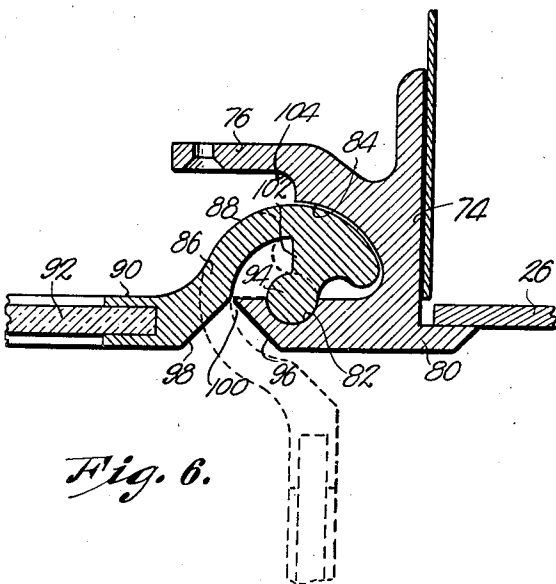


Fig. 6.

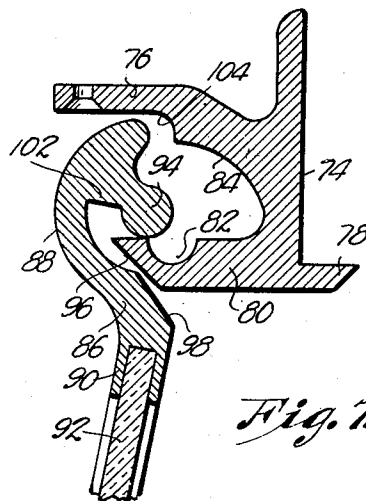


Fig. 7.

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UNITED STATES PATENT OFFICE

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HINGE

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5 Claims. (Cl. 16—178)

This invention relates to hinge constructions and has particular reference to a frame and closure structure having hinge parts detachably interconnected.

The principal object of the present invention is the provision of an elongated hinge comprising two members formed to permit of limited hinging action and adapted to be disengaged by a transverse relative movement of the parts.

Other objects are simplicity and economy of construction, ease of operation, and adaptability as a concealed two-piece hinge to form a structural part of the closure and the closure frame.

With these objects in view, reference will now be had to the drawings wherein:

Figure 1 is an inverted plan view of a ceiling closure and closure frame including the hinge embodied in this invention.

Fig. 2 is an enlarged sectional view of the structure showing the hinge members.

Fig. 3 is an enlarged fragmentary sectional view showing a cross section of the hinge parts closed in solid lines and open in the dotted lines.

Fig. 4 is a section similar to that shown in Fig. 3, with the hinge members in the disengaging position.

Fig. 5 is a perspective view of a portion of the elongated hinge parts.

Fig. 6 is a cross sectional view of a modified form of the hinge shown in the closed position, and in the open position in dotted lines; and

Fig. 7 is a view similar to that shown in Fig. 6 with the hinge parts in the disengaging position.

When the structure herein described and claimed is to be used in connection with a closure for recessed light compartments, there is a hinge part 10 secured to a building structure 12, into which is mounted a light-box 14 having an intumed flange 16 to which is secured hinge member 10 by means of screws 18.

A flange 20 formed inwardly from the inner portion of part 10 is perforated at 22 to receive the screw 18 so that as the screws are tightened, the outwardly projecting flange 24 of hinge member 10 will be drawn tightly against the wall structure 26, as shown in Fig. 2. In this type of light fixture, the rectangular frame 28 formed by four strips of hinge member 10 mitered and secured together, is disposed in a horizontal position in the ceiling; however, it may be used in a vertical position in a side wall, or at any oblique angle.

The outer portion of hinge part 10 is provided with an inwardly projecting flange 30 terminating in a longitudinally extending arcuate hinge head 32 with its axis 34 disposed parallel with and within the outer surface of hinge part 10. Head 32 has an outer arcuate bearing surface 36 and an inner bearing surface 37 concentric with said first named bearing surface, but of a smaller radius, thus forming a radial shoulder 38 therebetween.

Shoulder 38 is preferably disposed in a plane perpendicular to the outer face of the hinge part 10. An internal arcuate wall 40 concentric with arcuate surface 36, but of greater radius, is formed in part 10 intermediate flanges 20 and 30, and serves to maintain the hinge parts in operative relation. This hinge part is preferably made of extruded metal and can be of any desired length. The other hinge part 42 comprises an extruded metal strip having an arcuate portion 44 with an inside arcuate wall 46 adapted to operatively engage bearing surface 36 as the outside wall 48 thereof engages the arcuate wall 40, to maintain the hinge parts in operative relation when the closure is in the closed position.

The outer extremity of hinge part 42 has an intumed bead 50 which normally contacts the inner arcuate bearing surface 37 and serves as a stop to engage shoulder 38 for limiting the swinging action of the hinged closure. The inner end of member 42 is offset at 52 to receive the diaphanous sheet 54, which is secured in position by strip 56, secured by screws 58.

The outer end of flange 30 is beveled at 60 and the hinge part 42 is beveled at 62 to present a groove 64 which terminates in a horizontal plane determined by the axis 34.

When the hinge parts are in the operative position shown in Fig. 3, they are coaxially related and are normally secured against disengagement. When the closure is in the open position as shown in dotted lines in Fig. 3, it is impossible to raise the hinge, part 42 vertically to disengage it from part 10. However, by moving the closure to a partially closed position, as shown in Fig. 4, then the hinge part can be raised to permit bead 50 to disengage shoulder 38 so that the hinge parts may be separated by a simple, relative movement of the parts. With this construction, it is apparent that all necessary operations for opening, closing and removing the closure is confined to a space described by and directly below the frame, thus precluding any possible interference from adjacent walls or posts as the closure is removed.

With all sides of the closure formed of hinge member 10, it is apparent that a hinge member 42 may be interconnected to any of its four sides for operation therewith.

The frame shown by joining together members 10, is of a square shape, but might be of any other polygonal shape with a closure made to fit.

The closure frame member 66 is provided with an inwardly extending lip 68 provided with an opening 70 into which the spring detent 72 carried by hinge part 10 engages to secure the closure in the closed position.

It is very apparent that this closure can be easily removed without the removal of any pintle and furthermore, the hinge is concealed from view in the recess.

Reference will now be had to the modified form

shown in Figs. 6 and 7, wherein the hinge part 74, which is preferably extruded and of uniform cross sectional area.

An inturned flange 76 integral with part 74 serves to anchor the hinge member to flange 16 and to draw the out-turned flange 78 against the ceiling surface. The outer portion of hinge part 74 is provided with a relatively thick inturned flange 80 having a longitudinal groove 82 of semi-cylindrical cross sectional area. The body portion of part 74 is formed with an arcuate wall 84 disposed concentrically with groove 82.

This hinge part 86 has an arcuate portion 88 and a bifurcated end portion 90 adapted to receive the glass closure member 92. Arcuate portion 88 is provided with a bead 94 of cylindrical form adapted to operatively engage groove 82 to provide a hinge joint. The outer surface of portion 88 is concentric with bead 94 and fits snugly within wall 84 when the closure is in the closed position (see Fig. 6).

Edge portions 96 and 98 of parts 74 and 86 respectively, are beveled to form a groove 100 which terminates in a horizontal plane determined by the common axis of the hinge parts.

The neck 102 interconnecting bead 94 with arcuate portion 88 serves as a stop to limit the opening movement of the closure. When it is desired to disengage the hinge parts, the closure member is moved slightly toward the closed position from the open position, and then raised to move bead 94 from groove 82 with the outer extremity of arcuate portion 86 extending into the offset recess 104.

By making slight changes in the hinge parts, the degree of opening of the closure might be increased or decreased to suit the requirements. A 90° opening of the closure is usually sufficient for a ceiling closure, however, when the hinge is used in a vertical position, it may be convenient for the closure to move through a greater arc.

While the structure shown and described provides for an elongated concealed two-piece hinge that is simple in construction and easily assembled, yet many minor changes might be made without departing from the spirit of the invention, and it is therefore desired to be limited only by the scope of the claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A hinge comprising a stationary hinge member having an elongated head with an arcuate bearing face and an internal arcuate wall concentric with and spaced apart from said arcuate bearing face of greater radius than the radius of said bearing face; a closure member having an edge member formed to present an arcuate portion adapted to be positioned on said bearing face with its outer extremity adjacent said arcuate wall when the closure is in the closed position, a substantially radially disposed shoulder formed on said stationary member adapted to cooperate with a bead formed on said arcuate portion of said edge member to limit the opening movement of said closure, said arcuate edge portion being of sufficient degree of curvature to engage opposite sides of said head when the closure is fully open to secure the hinge parts against transverse separation.

2. A hinge comprising a hinge member having an arcuate bearing face and an arcuate wall concentric with and spaced apart from said bearing face, and a hinge member mounted on the edge of a planar closure and formed to operatively

engage said bearing face for pivotal movement thereon and to substantially engage said wall when the closure is in the closed position and to move out of engagement therewith when the closure is disposed at slightly less than 90° from its closed position whereby the hinge parts may be separated by relative movement of the hinge parts transversely of their axis of rotation.

3. A hinge comprising an elongated stationary hinge member having a head provided with an arcuate bearing face, an arcuate wall formed in said hinge member concentric with said bearing face and of greater diameter disposed in arcuate offset relation thereto, a radial shoulder extending inwardly from the edge of said arcuate bearing face, a closure hinge member having an arcuate edge portion adapted to rest on said arcuate bearing face with its free edge disposed downwardly adjacent said arcuate wall and a radially disposed inturned bead extending along the lower edge of said arcuate portion whereby when said closure hinged member is moved to the fully open position said arcuate hinge portion will move from its position relative to said arcuate wall with said bead resting against said shoulder as the arcuate portion of said movable hinge engages the opposite side of said head, said relatively movable hinge members being beveled to permit the transverse separation thereof when the closure member is in a partially open position.

4. A hinge comprising a stationary part having an elongated head with concentric offset bearing surfaces, a radial shoulder joining said bearing surfaces, an internal arcuate wall formed in said stationary part spaced apart from and concentric with the innermost of said bearing surfaces to form an arcuate recess therebetween, a bottom wall at the lower extremity of said head, a movable hinge part having an arcuate edge portion terminating in a radially inturned bead and adapted to be positioned in said arcuate recess to rest on said bearing surfaces, said radially inturned bead being adapted to rest on said inner bearing surface and to engage said shoulder to limit the hinging movement as the inner portion of said arcuate edge portion is positioned below said bottom wall to prevent upward movement of the movable hinge member when said member is in the fully opened position, and said movable hinge member being adapted to be moved transversely relative to said head when the movable hinge member is in the partially open position.

5. A hinge comprising a stationary part having a head with an outer arcuate bearing surface and an inner bearing surface of less radius and concentric with said outer bearing surface with a radial shoulder joining said outer and inner bearing surfaces, an internal arcuate wall formed in said stationary part spaced apart from and concentric with said inner bearing surface to form an arcuate recess therebetween, a bottom wall extending below said head, a flange extending in spaced apart relation above said head, a movable hinge part having an arcuate edge portion adapted to be positioned in said arcuate recess to rest on said outer bearing surface, a radially inturned bead at the free end of said arcuate edge portion adapted to rest on said inner bearing surface and to engage said shoulder as the inner portion of said arcuate edge portion is positioned below said bottom wall to prevent upward movement of the movable hinge member when said member is in the fully opened position.