Sept. 17, 1940. J. SOSS 2,215,088

CONCEALED HINGE

Filed April 22, 1938

Fig. 1.

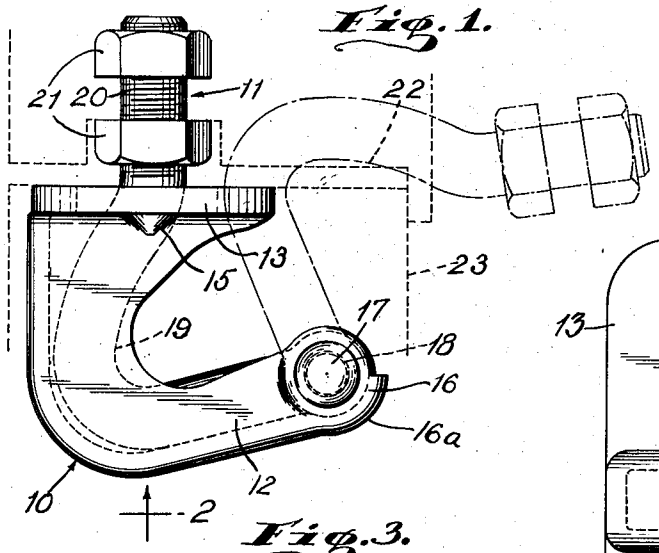


Fig. 2.

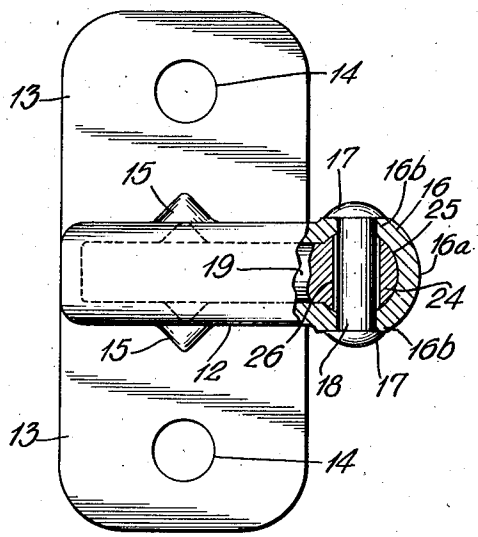


Fig. 3.

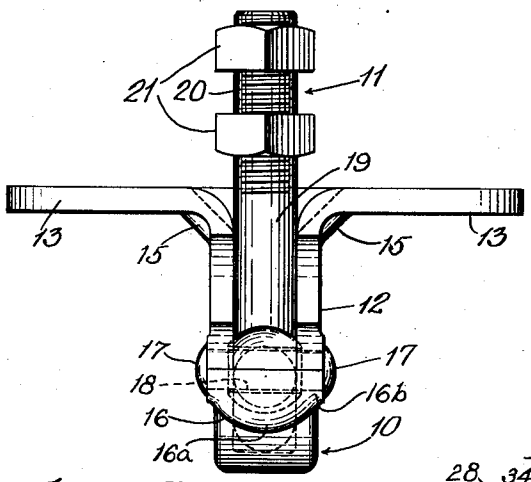


Fig. 4.

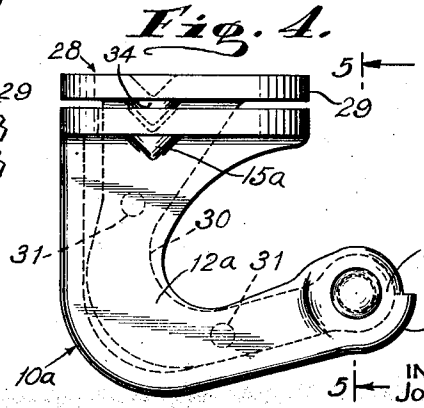
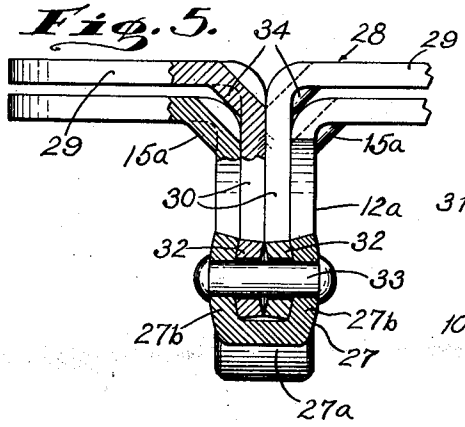


Fig. 5.



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CONCEALED HINGE

Joseph Soss, Roselle, N. J.

Application April 22, 1938, Serial No. 203,519

3 Claims. (Cl. 16—135)

This invention relates to what are commonly termed concealed hinges, that is to say hinges wherein the butts are disposed between adjacent edges of a stationary support and swinging member; for example between the door frame and door of a motor vehicle; and the object of the invention is to provide a hinge of the character described composed of two economically formed butt parts, one of which consists of a hook-shaped housing of channelled cross sectional form including integral attaching plates at the outer surface thereof, and the other butt being in the form of a hook-shaped arm which nests within the channel or housing of the first named butt when the butts or hinge are in closed position; a further object being to provide means for reinforcing and stiffening the hook-shaped portion of the first named butt with respect to the attaching plate portions thereof and further to provide corresponding means for reinforcing the attaching plates of the other butt when such plates are employed; a further object being to provide the free end of the channelled hook arm of the first mentioned butt with a ball socket or rounded portion forming a swivel bearing for the free end of the arm of the second mentioned butt therein to compensate for slight irregularities which may prevail in door alinement, the free end of the hook-shaped arm having a ball or rounded portion seating in the socket of the first named butt, and with these and other objects in view the invention consists in a hinge of the class and for the purpose specified, which is simple in construction, efficient in use, and which is constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:

Fig. 1 is a plan view of a hinge made according to my invention showing the parts in closed position and indicating in dotted lines the open position of the hinge.

Fig. 2 is a view of the hinge shown in Fig. 1 looking in the direction of the arrow 2 of said figure with part of the construction broken away and in section.

Fig. 3 is a side edge view of the hinge as seen in Fig. 1.

Fig. 4 is a view similar to Fig. 1 showing a modification, and

Fig. 5 is a section on the line 5—5 of Fig. 4 showing other parts of the structure broken away and in section.

In Figs. 1 to 3 inclusive I have shown one form of hinge consisting of two butt parts 10 and 11, part 10 being formed from a single sheet of metal shaped to form a hook-shaped housing portion 12 of channelled cross sectional form throughout its length to provide spaced top and bottom walls which are of the shape illustrated in plan in Fig. 1 of the drawing. The outer end of the housing 12 terminates in laterally extending attaching flanges or plates 13, each having one or more screw or bolt apertures 14. These plates are reinforced and stiffened with respect to the hook-shaped housing 12 by inwardly pressed corrugated portions 15 substantially V-shaped in form which give strength and rigidity to the butt plates as well as to the housing 12.

The free end portion of the hook-shaped housing 12 is shaped to form what is termed a ball end 16. That is to say, the perpendicular wall of the housing is curved or bulged outwardly as seen at 16*a*, and this continues into correspondingly bulged or curved upper and lower portions 16*b* which extend into the top and bottom plates of the channel-shaped housing, as will appear from a consideration of Fig. 2 of the drawing. It is preferred, however, that the latter rounded portions be flattened as seen at 17 to receive the heads of a rivet pin 18 forming the pintle of the hinge.

The other butt 11 of the hinge consists, in the construction shown, of a rod or bolt fashioned to form a hook-shaped portion 19 of such contour as to nest within the housing 12 in the manner illustrated in Fig. 1 of the drawing. One straight end 20 of the bolt is threaded to receive one or more nuts 21 employed to secure the butt to its support. The outermost nut is preferably countersunk in the surface of the support 22, indicated in dotted lines in Fig. 1 of the drawing, which would constitute the door or swinging member. The other support is indicated at 23 in dotted lines in said figure.

The other end 24 of the hook-shaped arm 19 of the butt 11 terminates in what might be termed a ball end which seats snugly in the socket 25 formed by bulging or enlarging the end of the housing 12. An aperture 26 extends through the head 24, and it is preferred that sufficient clearance be allowed around the pin 18 to provide for a slight swivel movement of the head 24 within the socket 25 especially when the hinge is in open position.

While the arm 19 is shown as fitting closely

within the top and bottom walls of the housing 12, it will be understood that slight clearance may be provided between these surfaces. However, the slight swivel action of the butt is desirable in the operation of moving the door from an open to a closed position. In this connection, it will be understood however, that the question of swivel action may be dispensed with. This is especially true when using a pair of the hinges of the type and kind herein shown for supporting the vehicle door. When the swivel action is provided, it is usually intended to use one hinge of the type here indicated in conjunction with a conventional hinge commonly employed for hanging vehicle doors of the class under consideration.

At this time it will also be apparent, however, that while I have described, above, the invention as applied to motor vehicle doors, it will be understood that the hinge may be used in conjunction with any type or kind of door, or for any purpose whatever where hinges of the concealed type and kind are practical and desirable.

In Figs. 4 and 5 of the drawing I have shown a slight modification. In this figure the butt part 10*a* differs from the butt part 10 of Figs. 1 to 3 simply in the transverse dimensions of the channelled housing 12*a* and in substituting for the ball-like end 16 an end 27 having an outer bulged or rounded portion 27*a* and upwardly and downwardly bulged portions 27*b* on the top and bottom walls of the housing, as will appear from a consideration of Figs. 4 and 5 of the drawing.

Substituted for the butt part 11 is a butt part 28 consisting of two similar L-shaped plate portions as viewed from the side, each having an attaching plate part 29 and a hook arm part 30. The hook arm parts are arranged one upon the other and riveted or otherwise secured together as indicated by the dotted lines 31 in Fig. 4 of the drawing to form a unitary construction of the butt 28. The outer ends of the hook arm portions 30 have outwardly bulged portions 32, note Fig. 5, which seat in the recesses formed by the bulges 27*b*, and a rivet pin or bolt 33 passes through the portions 27*b* and 32. By providing slight clearance of the parts 32 on the rivet or pintle pin 33, a slight swivel action will be obtained as with the structure shown in Figs. 1 to 3 inclusive, especially when the butt parts are in open position. However, as previously stated, this action is not at all essential in certain uses of the hinge.

It will also appear that the attaching plate portions 29 of the butt 28 join the hook arms in V-shaped reinforcement corrugations 34 similar to the corrugations 15*a* employed in the butt 10*a*. The butt part 28 forms the subject matter of a separate application, Serial No. 203,521, filed April 22, 1938, which has since matured into a Patent No. 2,163,713 dated June 27, 1939, and for this reason no further detailed description of this butt is deemed necessary in this case.

It will appear upon a consideration of Figs. 1 and 4 of the drawing that the top and bottom plates of the channelled housings 12, 12*a*, where they join the attaching plates are of a width substantially equal to the width of the attaching plates thereby supporting the hook-shaped channelled housings throughout the full width of the hinge mounting.

By reason of the manner of constructing the separate butt parts, it will appear that the manufacturing cost of producing the hinge is materially reduced as compared with other hinges of the type and kind here under consideration, while at the same time a strong and durable hinge is produced. It will also be apparent that the specific contour and dimensions of the hook portions of both butt parts may be varied or modified to suit the different uses to which the unit is applied and to care for the necessary swinging movement which is desired.

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

1. In a concealed hinge of the character described comprising pivotally coupled hinge butts, each having hook-shaped arm portions, one of said butts being formed from a single sheet of metal, the hook arm portion of said butt being in the form of a housing of channelled cross sectional form throughout its length, the channel formation of said butt part providing spaced top and bottom walls, said top and bottom walls being parallel substantially throughout the major portion of the length thereof, the attaching end of said butt having laterally extending attaching plates, the hook-shaped housing portion of the butt comprising a part extending substantially at right angles to said attaching plates, a free end part extending in its entirety at an angle less than 90° to the first named part and being offset in the direction of the attaching plate end of said butt to dispose the pivot end of the butt in closer proximity to the attaching plate end of the butt than the inner end of said first named part, and the free end of the second mentioned part of said housing terminating in a domed socket apertured to receive the pintle of the hinge.

2. In a concealed hinge of the character described comprising pivotally coupled hinge butts, each having hook-shaped arm portions, the hook arm portion of one butt being in the form of a housing of channelled cross sectional form throughout its length, the attaching end of said butt having laterally extending attaching plates, said housing comprising a part extending substantially at right angles to said plates, another integral part extending in its entirety at an angle less than 90° to the first part and offset in the direction of said plates, the free end of the last named part terminating in a domed apertured socket for the pivot pin of the hinge.

3. In a concealed hinge of the character described comprising pivotally coupled hinge butts, each having hook-shaped arm portions, the hook arm portion of one butt being in the form of a housing of channelled cross sectional form throughout its length, the attaching end of said butt having laterally extending attaching plates, said housing comprising a part extending substantially at right angles to said plates, another integral part extending in its entirety at an angle less than 90° to the first part and offset in the direction of said plates, the free end of the last named part terminating in a domed apertured socket for the pivot pin of the hinge, the top and bottom plates of the housing adjacent the attaching plates being of a width equal to the width of said attaching plates, and upper and lower surfaces of the domed end of said housing being flat.

JOSEPH SOSS.