

Feb. 26, 1946.

C. J. PETERSEN

2,395,501

CONCEALED DOOR HINGE

Original Filed July 12, 1937

Fig. 1.

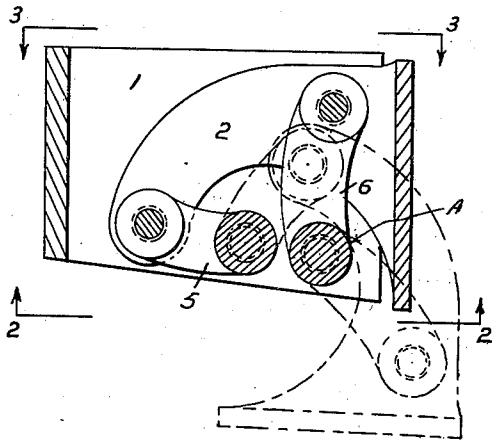


Fig. 2.

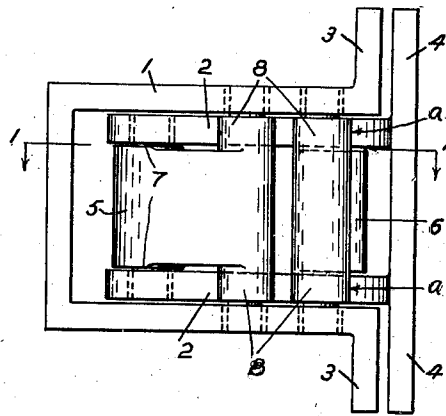


Fig. 3.

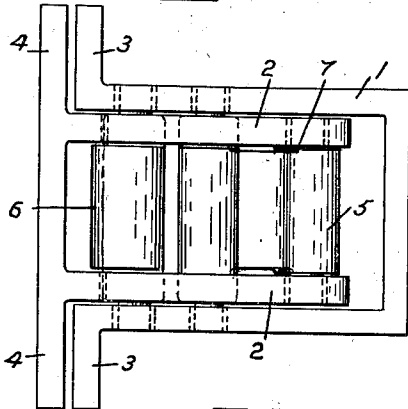


Fig. 4.

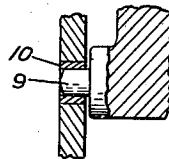


Fig. 5.

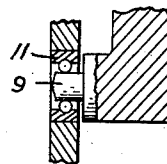


Fig. 7.

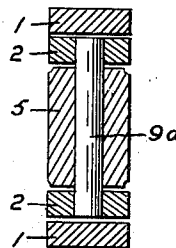
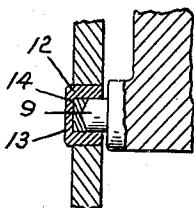


Fig. 6.



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UNITED STATES PATENT OFFICE

2,395,501

CONCEALED DOOR HINGE

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Substituted for abandoned application Serial No. 153,189, July 12, 1937. This application January 30, 1943, Serial No. 474,195

1 Claim. (Cl. 16—164)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to me of any royalty thereon.

The present application is a substitute for my previously filed application for Letters Patent, Serial Number 153,189, filed July 12, 1937.

My present invention relates to door hinges and more particularly to door hinges of the concealed type, being designed especially for use upon motor vehicle doors but adapted also for refrigerators, house and office doors, etc. Among the objects of this invention are to provide a hinge of the type indicated which will be especially strong and sag-proof; to provide a hinge of the character indicated which will be entirely invisible when the door is closed and yet will permit the door to swing outwardly and completely clear the body of the machine or other structure, as it swings; to provide a hinge of the type indicated which is so proportioned and constructed that the door is permitted to close without the external cover thereof coming in contact with the metal cover of the body and yet the two will fit so closely together that there is substantially no opening through which rain can get into the body of the vehicle or other structure upon which this hinge is used; to provide a hinge for the purpose indicated in which, in event of wear of hinge parts, replacement of an inexpensive part may be made, avoiding the necessity of substitution of a whole new hinge; and such further objects, advantages, and capabilities as will hereafter appear and as are inherent in the construction disclosed herein. A further object of the invention is to devise a hinge of the character described implemented with means which forms part of the hinging mechanism, adapted to limit the extent of turning or opening of the door portion of the hinge relative to the fixed-casing portion. My invention further resides in the combination, construction, and arrangement of parts illustrated in the accompanying drawing and, while I have shown therein what is now regarded as the preferred embodiment of this invention, I desire the same to be understood as illustrative only and not to be interpreted in a limiting sense.

In the drawing annexed hereto and forming a part hereof, Fig. 1 represents a horizontal section through a hinge in accordance with my invention, the same being represented as taken substantially along the plane indicated by the line 1—1 of Fig. 2;

Fig. 2 represents an elevation of a hinge con-

structed in accordance with my present invention, the same being taken in the direction indicated by the arrows 2—2, Fig. 1;

Fig. 3 represents an elevation similar to Fig. 2 but taken in the opposite direction, as indicated by the arrows 3—3, Fig. 1;

Fig. 4, 5, and 6 represent different types of bearings which may advantageously be used in a hinge constructed in accordance with my invention, these figures representing fragmentary sections through two parts of a construction in accordance with my invention;

Fig. 7 represents a transverse section of a modified construction in which the bearing bushings are omitted.

The present hinge comprises a pair of U-shaped body members 1 and 2 connected by blocks 5 and 6, the body member 1 being provided with attaching flanges 3 at the free ends of the arms of the U-shaped member, and the member 2 being provided with flanges 4 at the closed end of the U-shaped member. As shown in Fig. 1, the arms of the U-shaped member 2 are not straight but are somewhat hook-shaped in order to permit the necessary amount of swinging of the hinge parts in order to permit the desired amount of opening of the door.

As shown clearly in Figs. 2 and 3, one of the U-shaped members fits within the other one and is pivoted to swing therein, as shown in Fig. 1. The blocks 5 and 6 are provided at their corners with bosses 7 and 8 from which extend the pintles 9. Bushings 10, 11, and 12, which are shown in Figs. 4, 5, and 6 in accordance with various forms which they may take, are pressed into openings in the U-shaped members 1 and 2 and cooperate with the pintles 9 in forming bearings between the members 1 and 2 and the blocks 5 and 6. The bushings have a press fit in the openings in the members 1 and 2 so that they will not rotate therein. The pintles 9 have their cylindrical surface finished reasonably accurately so that the bearings will be substantially frictionless when the door swings to open or closed position.

In Fig. 4 there is shown a simple bearing of a pintle 9 within a bushing 10. In Fig. 5 this is shown as a ball bearing by involving a large bushing 11 having a ball race in its internal surface and balls mounted in the space between the pintle 9 and the bushing 11. In Fig. 6 the bushing 12 is in the form of a cup which has a closed end 13 and within which is a felt-like material 14 which is saturated with a lubricant.

In manufacturing the parts, the U-shaped

members are made somewhat V-shaped in form so that the pintles 9 of the blocks 5 and 6 may be inserted in the openings in the arms of the U-shaped members. After this has been done, the U-shaped members are bent into true form so that the arms thereof nearly engage the bosses 7 and 8. The bushings which it is intended to use are then pressed into the openings to the proper extent and the hinge is completed. Forming the hinge in this way avoids the expense of drilling the openings through the blocks 5 and 6 and providing pivot pins to extend through these blocks and the arms of the U-shaped members. In the form used in the construction shown in Fig. 6, the lubricating means will lubricate the bearings substantially indefinitely. With any of the forms, it is possible to remove the bushing, if the latter gets unduly worn so as to permit sagging of the door. However, it is believed that this will never be necessary, within the life of the ordinary motor vehicle.

In the construction shown in Fig. 7, the pintles 9 are replaced by pins 9a which extend through the blocks 5 and 6 and the parallel arms of the U-shaped members 1 and 2. In this construction, the bushings 10, or their equivalents, are entirely omitted.

It should perhaps be noted that, by changing the relative positions of the pintle bearings in the arms of member 1, a change can be accomplished in the distance which the door moves outwardly away from the body when opening. This is utilized to compensate for differences in body curvature.

The aforescribed parts of the hinge are so designed that they provide a positive stop to the turning or opening movement of the body member 2 relative to the fixed body member 1. That is to say, the improved hinge is inherently

adapted to limit or check opening movement of the hinge without the need of providing separate or further stop means. The capability of the hinge parts to serve as an inherent stop or check is best seen in the dot-and-dash position of body member 2, Fig. 1 when fully turned to open position. In this position its two parallel arms 2 abut the extremities of the boss 8 of the pivot of block 6 on the parallel arms of member 1; this abutting point between the arms 2 and the said pivot of block 6 is designated "A" in Fig. 1. The manner in which the parallel arms 2 contact the extremities of the pivot, or rather the bosses 8, is best seen in Fig. 2, where the two points of abutment are designated "a."

It will of course be understood that the specific description of structure set forth herein may be departed from without departing from the spirit of this invention as set forth in this specification and the appended claim.

I claim:

In a concealed door hinge having substantially no exposed operating parts when in closed position and including a stationary member adapted to be secured in a casing and a second member adapted to be fastened to a swinging member and to be swung therewith in the opening and closing of said hinge, means for pivotally connecting said stationary and said second members, including a boss on said connecting means, a pivot extending from said boss and means forming a bearing in said stationary member adapted to cooperate with said pivot in the opening and closing of said hinge, said boss providing a positive stop for said second member to limit the movement thereof relative to said stationary member in the opening of said hinge.

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