March 4, 1941. W. BOBEK 2,233,882

SELF-LOCKING CONCEALED HINGE

Filed Jan. 24, 1938

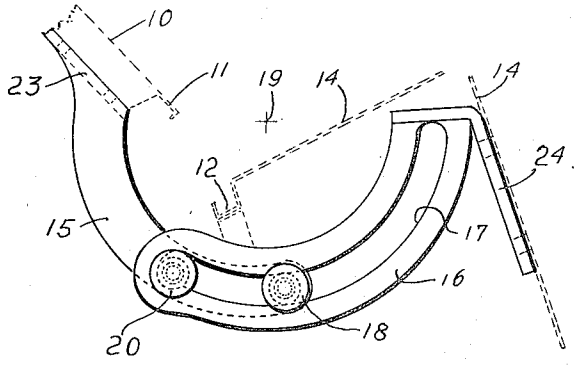


Fig. 1.

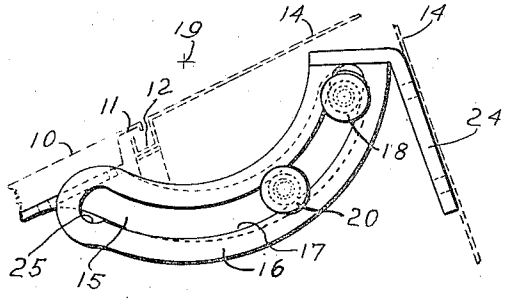


Fig. 2.

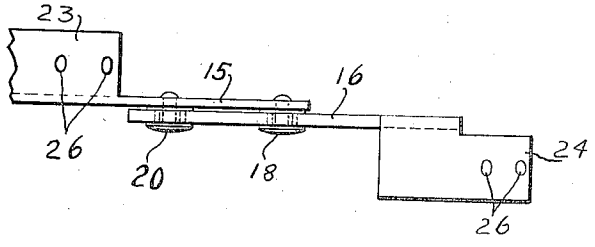


Fig. 3.

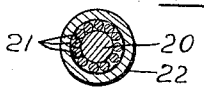


Fig. 4.

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## SELF-LOCKING CONCEALED HINGE

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3 Claims. (Cl. 16—143)

This invention relates to improvements in concealed hinges especially adapted for automobile deck lids, hood lids, ventilators, windshields, and similar closure elements.

In the automobile body art, especially in conjunction with streamlined body designs in which curved panels are common practice, it is desirable to employ a concealed type of hinge in order to maintain a thoroughly finished appearance to avoid unsightly and air-flow resisting projections. It is also essential to provide ample clearance between adjacent parts of the closure element and its frame member as the former swings to open position, especially where large clearance is required because of curved formation of the frame and closure elements.

One object of the present invention is to improve the art of concealed hinges.

Another object of the invention is to provide a concealed hinge embodying very few parts all of simple formation and easily constructed.

Another object of the invention is to provide a concealed type of hinge which automatically locks the closure element in its fully open position.

Another object of the invention is to provide a concealed hinge which permits ease of operation, ready locking of the hinge when the closure element has been extended to its fully open position, and permits the hinge to be readily unlocked in order to shut such closure element.

Other objects, features and advantages will become apparent from the following description and appended claims.

For the purpose of illustrating the genus of the invention, reference may be had to the accompanying drawing in which:

Figure 1 is a side elevation of a hinge constructed in accordance with the principles of the present invention, the hinge being illustrated in extended position and associated closure elements and frame elements being indicated in broken lines;

Fig. 2 is a similar view of the hinge depicted in closed position;

Fig. 3 is a top plan view of the hinge construction shown in Fig. 1; and,

Fig. 4 is a detail section of a part shown in the preceding figures.

In Figs. 1 and 2 of the drawing, the numeral 10 designates a closure element which may be an automobile decking lid, ventilator, windshield frame, or similar closure part. The closure element 10 is provided with a peripheral overlap flange 11 adapted to cooperate with a water drain channel 12 of a frame indicated generally by the numeral 14. The channel 12 may be employed for the reception of a sealing strip of compressible material, such as sponge rubber or the like, where a more perfect seal of the closure element is desired.

The improved hinge, as shown, is depicted in the relationship in which it would occur when employed in conjunction with an automobile deck lid and comprises broadly, a pair of substantially arcuate members 15 and 16, the latter being provided with an arcuate slot 17 described about the point 19 as a center, and the former member being provided with a pair of spaced studs 18 and 20 disposed within such slot 17. The studs 18 and 20 are restricted to movement lengthwise of the slot 17 and to facilitate such movement, these studs are preferably provided with anti-friction elements which, as illustrated in Fig. 4, may be in the form of a roller bearing comprising a plurality of roller elements 21 and a retaining sleeve 22.

Either member 15 or 16 may be secured to the closure element 10 while the other member is secured to a frame part 14. In the illustrated embodiment, the arcuate member 15 is provided with an attaching plate 23 for fastening the same to the closure element 10 while the arcuate member 16 is provided with a similar attaching plate 24 for fastening the member 16 to a portion of the frame 14. The arcuate slot 17 of member 16 terminates at the outer end thereof, in a laterally disposed notch 25 into which the stud 20, or its anti-friction bearing when such is provided, may drop when the closure element 10 is moved to its fully open position. Movement of the studs 18 and 20 lengthwise of slot 17 causes the closure member 10 to swing about an imaginary horizontal axis passing through the point 19. The weight of the closure element 10 tends to rotate the same together with the arcuate member 15 about the stud 18 as a center causing the stud 20, or its anti-friction bearings, to remain within the notch 25 and thus automatically hold the closure element 10 in its fully open position. It is noted, however, that if the arcuate members 15 and 16 were extended in length so that the closure element 10 would swing to and beyond a vertical plane that the notch 25 would be disposed radially inwardly with reference to the outer terminal end of the slots rather than outwardly as in the illustrated embodiment. To release the closure element 10 from its locked condition at the fully opened position thereof, it is merely necessary to lift the closure element

10 slightly and then push the same toward the frame elements 14 until the stud 20, or its antifriction bearing, clears the notch 25. The closure element 10 then can swing or be manually lowered to its closed position.

Referring to Fig. 1, it is noted that the closure element 10 and its overlap flange 11 have a large clearance with reference to adjacent parts of the frame 14 and that such clearance would be ample to prevent interference between the closure and frame parts even though the latter be of curved formation. The ends of the slot 17 are closed so that the stud 18 limits movement of the member 15 in but one direction when the hinge is in closed position while the stud 20 in conjunction with the holding means or notch 25 holds the arcuate member 15 against movement in either direction relative to the member 16 until the stud 20 is swung upwardly to clear the notch 25. The studs 20 and 18 are fixed to the arcuate member 15, preferably by riveting, but may be secured thereto by threading, welding, or other desired expedient. The plates 23 and 24 are provided with suitable openings 26 through which bolts, rivets, screws or similar fastening means may be projected for securing the arcuate members 15 and 16 to the closure and frame elements.

In the operation of the hinge, the closure member 10 swings open about a horizontal imaginary axis which passes through the point 19 as the studs 18 and 20 travel lengthwise of slot 17. As the stud 20 reaches the closed outer end of slot 17, release of the closure member 10 will allow the latter to swing about an axis passing horizontally through the center of the stud 18, and permits the stud 20 or its antifriction bearing to drop into the notch 25. To close the closure element 10, it is only necessary to lift the outer end of the same which swings it about the axis of stud 18 as a center until stud 20 clears notch 25, and then push the closure element toward the illustrated parts of frame 14 to cause the closure element to swing about the imaginary axis which intersects point 19. Once the stud 20 is inside the notch 25, the closure element 10 will continue to swing about the imaginary axis as a center under the influence of gravity until in fully closed position.

As many changes could be made in the above described construction, and many apparently widely different embodiments could be had without departing from the scope of the present invention, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A concealed hinge for a closure element comprising a pair of members, one member being provided with an arcuate slot terminating at one end in an outwardly disposed notch and the other member having fixed thereto a pair of studs disposed in said slot for movement lengthwise thereof, one of said studs being adapted to drop into said outwardly disposed notch of said slot to lock the hinge in open position.

2. A concealed hinge for a substantially horizontally pivoted closure element comprising a pair of substantially arcuate members, one of said members being provided with a substantially arcuate slot terminating at one end in a laterally disposed notch and the other member having fixed thereto a pair of spaced studs disposed in said slot for movement lengthwise thereof, one of said studs being adapted to drop into said laterally disposed notch of said slot to lock the hinge in open position.

3. In a concealed hinge for a substantially horizontally pivoted closure element, the combination with two plates adapted to be secured to adjacent edges of a relatively stationary frame and such closure element, respectively; of two substantially arcuate members each integral with one of said plates, one member being provided with an arcuate guide means including holding means at one end thereof and the other member having a plurality of bearing means fixed thereto in spaced relation to each other and arranged so that said guide means restricts movement thereof to movement lengthwise of the guide means, said guide and bearing means causing said closure element to swing about an imaginary axis as a center, which axis intersects no parts of said hinge, and said holding means locking said members against relative lengthwise movement in either direction at one limit of movement of one member relative to the other, said closure element swinging about the axis of one of said bearing means as a center to cause another of said bearing means to engage said holding means to lock said members against relative movement.

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