July 2, 1957 T. VIGMOSTAD 2,797,434

HOOD OR DECK LID HINGE

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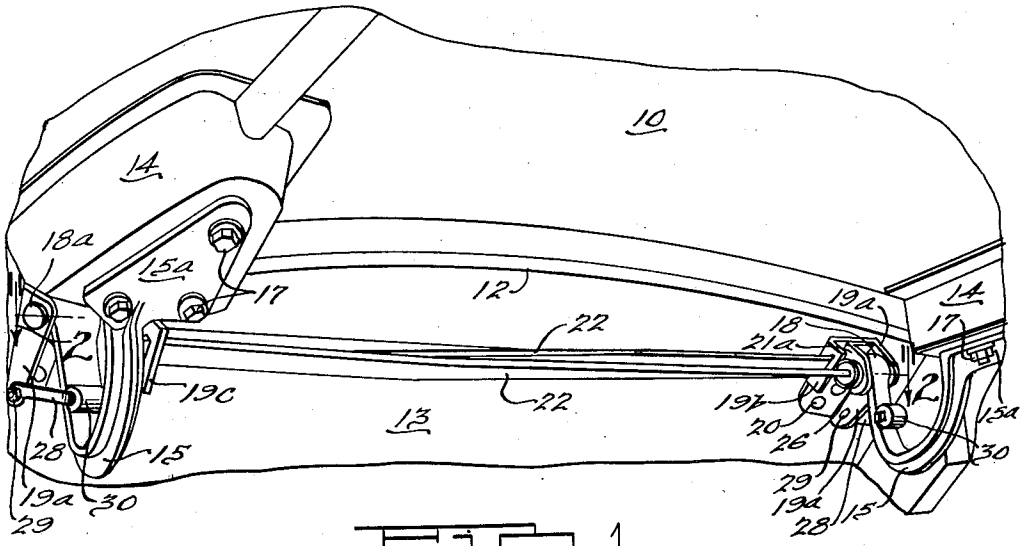


Fig. 1.

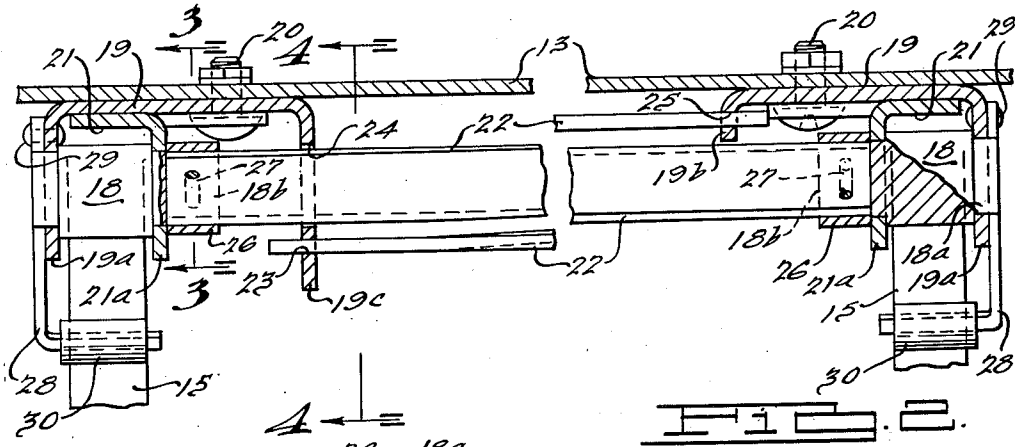


Fig. 2.

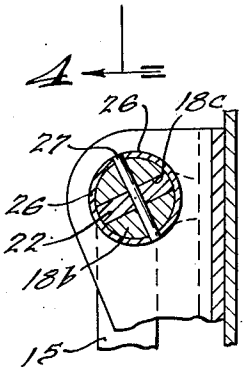


Fig. 3.

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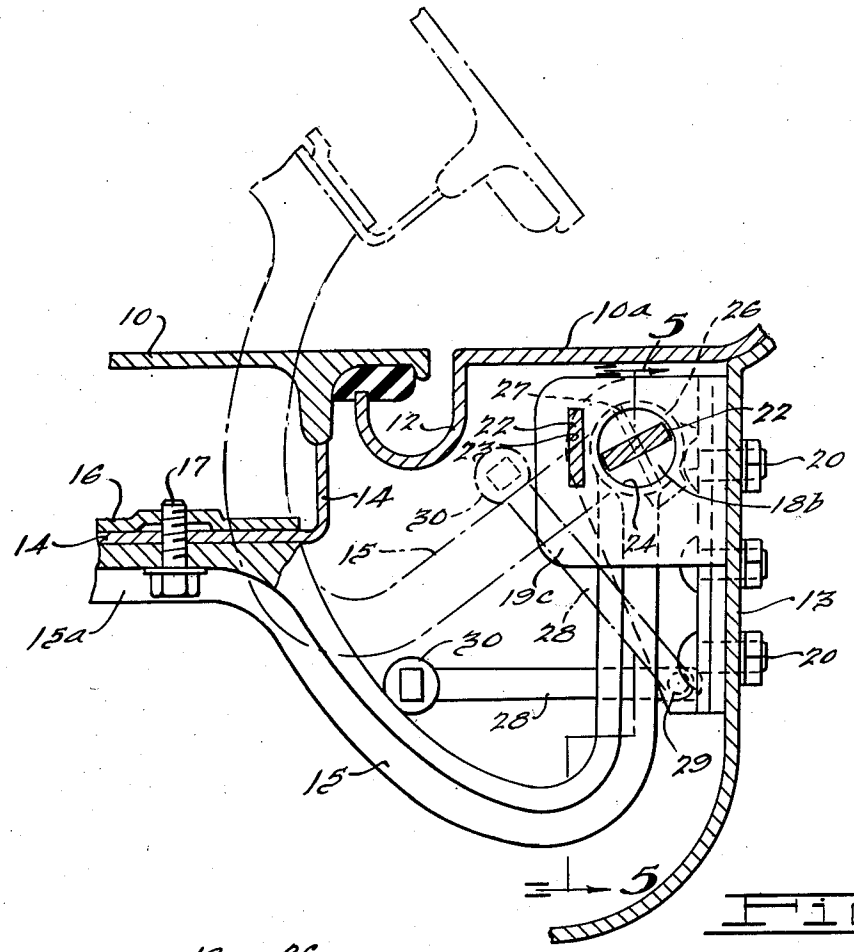


Fig. 4

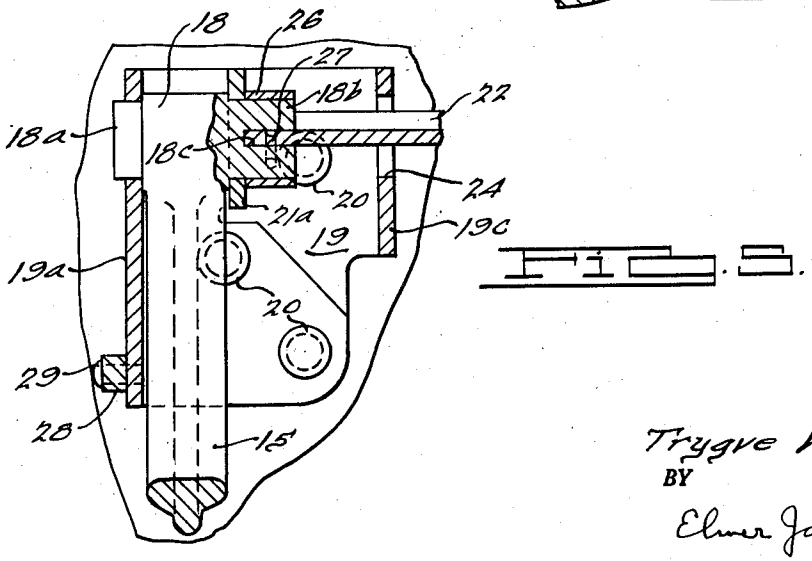


Fig. 5

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HOOD OR DECK LID HINGE

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4 Claims. (Cl. 16—184)

This invention relates to hinge structures for swinging lids or closures and in particular to a hinge structure that is especially useful for the hood or deck lid of an automobile body and which embodies spring means effective to raise or assist in raising the hood or deck lid and counterbalance the weight thereof.

An object of the invention is to provide a hinge structure for a swinging lid or closure, such as an automobile hood or deck lid, having swinging hinge arms means attached to the lid and torsional spring means acting on the hinge arm means to exert a lifting force effective to raise or assist in raising the lid to open position.

In accordance with the embodiment of the invention herein illustrated by way of example, a pair of pivotally mounted hinge arms are attached to the lid or closure adjacent opposite sides thereof. Each of a pair of transversely extending torsion bars or blades is connected at one end to one of each of the hinge arms to swing the same and is secured against rotation at its other end to a fixed bracket or body member. Thus at each side of the lid or closure a rotatable end of one of the torsion bars or blades is attached to the hinge arm at that side and a fixed end of the other torsion bar or blade is attached to a part of the body. The pair of spring torsion members comprising the rods or blades are initially twisted to a predetermined angular degree so as to exert a rotative effort on the hinge arms, which is translated into a lifting force on the lid tending to raise the latter from its closed position. Hence, when the lid is unlatched, the torsional spring means acting through the hinge arms will swing or assist in swinging the lid upwardly to the open position.

It will be apparent that the torsional spring means provides a simple, efficient and economical lifting or counterbalancing means for a hood or deck lid. Moreover, by utilizing the torsion members comprising rods or blades of spring material extending transversely of the vehicle body at the region of the hinge arms, a very compact and economical construction is provided. It will also be seen that by virtue of this construction, equivalent lifting forces will be applied to opposite sides of the lid and the latter will be raised smoothly and evenly.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

Fig. 1 is a fragmentary perspective view showing an automobile hood hingedly mounted on the vehicle body by means of a pair of transversely spaced goose-neck hinges and counterbalanced by torsion blades embodying the present invention, as viewed from the front and below the hood.

Fig. 2 is a fragmentary enlarged section taken substantially in the direction of the arrows along the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary section taken in the direction of the arrows substantially along the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary section taken in the direction of the arrows substantially along the line 4—4 of Fig. 2, the hood being shown in open position in phantom.

Fig. 5 is a fragmentary section taken in the direction of the arrows substantially along the line 5—5 of Fig. 4.

It is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

In the drawings, the hinge structure embodying the present invention is illustrated in association with the vertically swinging front hood or closure **10** of an automobile body **11**. It will be understood that this is but illustrative of one use of the invention, since the same can be applied equally well for example to the deck or rear compartment lid of an automobile body. The cowl panel **10***a* of the body is crowned transversely and terminates at its forward edge in a transverse trough or gutter **12** underlying the rear edge of the hood. Beneath the cowl **10***a* is a rigid transverse body frame member **13**. Suitably secured to the under side of the hood at opposite lateral sides thereof are a pair of depending brackets **14**.

The hinge means supporting the hood **10** for vertical swinging movement comprises a pair of similar goose-neck hinge members **15** mounted beneath the cowl at opposite lateral sides thereof. The hinge member **15** at each side is provided with a forwardly extending arm portion **15***a* underlying the bracket **14** at the same side and rigidly secured thereto and to a reinforcing plate **16** overlying the bottom of the bracket **14** by means of a plurality of bolts **17**. The goose-neck portion of each hinge member provides clearance with respect to the trough **12** when the hood is swung upwardly to its open position as shown in dotted lines, Fig. 4, and terminates upwardly in an integral hub **18** pivotally mounted on a suitable support. The support for each hub **18** comprises a channel bracket **19** secured to the frame portion **13** by a plurality of bolts **20** and having a lateral forwardly extending vertical flange or plate **19***a*. Each support also includes an angle bracket **21** suitably secured to the base of the bracket **19** by the bolts **20** and provided with a forwardly projecting flange or plate **21***a* spaced inwardly from the plate **19***a* and parallel thereto. The inner portion of the channel bracket **19** at the right side in Fig. 2 comprises a short forwardly extending flange or plate **19***b* adjacent and parallel to the plates **19***a* and **21***a* and spaced inwardly from the latter. At the left in Fig. 2, the inner portion of the channel bracket **19** extends forwardly in a flange or plate **19***c* spaced inwardly from the adjacent plate **21***a*, the plate **19***c* being somewhat longer than the plate **19***b* and parallel thereto.

The body of each hub **18** spaces the juxtaposed plates **19***a* and **21***a* at each side of the hood and is provided with oppositely directed coaxial cylindrical extensions **18***a* and **18***b* of reduced diameter journaled in the plates **19***a* and **21***a* respectively. The extensions **18***b* at opposite sides of the hood extend coaxially inward toward each other, each being provided with an axial inwardly opening diametrical slot **18***c*, Fig. 3.

The spring means acting on the hinge members **15** comprises a pair of transversely extending torsion rods or blades **22** of uniform rectangular section, Figs. 3 and 4, each having one end splined within the slot **18***c* of one of each of the extensions **18***b*. In the present instance, one

of the blades **22** is a forward blade having a pivotal end secured within the slot **18***c* at the right in Fig. 2 and passing forwardly of the short plate **19***b*, Fig. 2. The opposite end of the forward blade **22** is secured at the left in Fig. 2 within a slot **23** located in the plate **19***c* forwardly of the other or rearward blade **22**. The latter has a pivotal end secured within the slot **18***c* at the left in Fig. 2 and extends freely through a circular opening **24** in the plate **19***c*. The opposite end of the rearward blade **22** is secured at the right within a slot **25** located in the plate **19***b* rearwardly of the forward blade **22**. Thus at each side of the hood, one torsion blade **22** is splined within the slot **18***c* at that side to swing the corresponding hinge arm **15**, the other torsion blade **22** being splined within a fixed part of the body at that side and being thereby held against pivotal movement with respect to the body.

In order to hold the blades **22** within their respective slots **18***c* and to prevent the latter from enlarging in consequence of the resilient forces described below, an annular collar member **26** is sleeved over each projection **18***b* and is keyed thereto by a pin **27**, Fig. 7, which extends diametrically through the collar **26** perpendicular to the broad surface of the blade **22**, Fig. 3. Movement limiting means comprising in the present instance a pair of swinging levers **28** pivoted at **29** to the plates **19***a* respectively terminate in inbent portions having gliders or rollers **30** thereon which overlie the hinge arms **15** at opposite sides of the hood and limit upward pivoting thereof, phantom view, Fig. 4.

When the hood is closed, the torsion blades **22** are under resilient tension yieldingly urging the hood upward toward its raised position. Thus in Figs. 1 and 2 wherein the hood is shown in the closed position, the foremost blade **22** is stressed clockwise looking from left to right and the rearmost blade **22** is stressed counterclockwise looking from right to left, thereby counterbalancing the weight of the hood and tending to swing the hinge members **15** upward when the hood is unlatched. The magnitude of the torsional force applied to the hood is preferably predetermined so as to cause the torsion blades to counterbalance the weight of the hood and to hold the same at its open position, phantom view, Fig. 4.

I claim:

1. In a hinge structure for a vertically swinging lid or closure of a vehicle body, a pair of coaxial transversely spaced hinge members for hingedly mounting said lid on the body, a pair of torsional spring blades extending transversely between said hinge members, each having a pivotal end connected coaxially to one of each of said hinge members to turn therewith and having a fixed end connected to a fixed portion of said body, said blades being of rectangular cross section and the fixed ends thereof being offset from the axis of said hinge members on opposite sides of said axis, the broad sides of said blades at said fixed ends being parallel to each other, and said blades being initially torsionally deflected angularly to exert a turning effort on said hinge members yieldingly urging the lid upwardly from its closed position toward its open position.

2. In a vehicle body having a vertically swinging lid or closure, a pair of transversely spaced hinge members pivoted on said body to swing about a common transverse axis, each of said hinge members being attached to the lid or closure to provide for vertically swinging

movement thereof, a pair of transversely extending torsion blades of rectangular cross section, each blade having a pivotal end secured coaxially with said axis to one of each of said hinge members and having a fixed end secured to a fixed portion of the body adjacent the other hinge member, the fixed ends of said blades being offset from said axis at opposite sides thereof and their broad sides at the fixed ends thereof being parallel to each other, said blades being initially torsionally deflected to exert turning effort on said hinge members tending to swing the lid upwardly toward open position.

3. In a vehicle body having a vertically swinging closure, a pair of transversely spaced hinge members for hingedly mounting said closure on said body, each hinge member having an axially extending hub portion coaxial with the hinge axis of the closure, a pair of torsion blades, each blade having a pivotal end splined within an axial slot in the hub portion of one of each of said hinge members to turn therewith and extending transversely toward the other hinge member to a fixed end, said blades being initially torsionally deflected to exert turning effort on said hinge members tending to swing the closure upwardly toward open position, and a pair of fixed brackets secured to said body at one side of said blades, one of said brackets having a recess therein, one of said blades extending through said recess, the fixed end of the other blade being splined in said one bracket at the side of said one blade opposite said one side, the other bracket terminating short of said other blade at said one side and having the fixed end of said one blade splined therein at said one side of said other blade.

4. In a vehicle body having a vertically swinging lid or closure, a pair of transversely spaced supports fixed to the body, a pair of transversely spaced hinge members having coaxial hub portions pivotally mounted on said supports to swing about a common transverse axis, each of said hinge members being attached to the lid or closure to provide for vertically swinging movement thereof, torsional spring means comprising a pair of torsion blades of rectangular cross section, each blade having a pivotal end splined within an axial slot in the hub portion of one of each of said hinge members to turn therewith and having a fixed end splined within a portion of the support for the other hinge member to be held against turning, said blades being initially torsionally deflected to exert turning effort on said hinge members yieldingly urging the closure upward toward open position, the broad sides of the fixed ends of said blades being at opposite sides of said axis and parallel to each other at the fixed ends thereof.

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