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2,185,212

COMPENSATING HINGE STRUCTURE FOR AUTOMOBILE HOODS OR THE LIKE

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Fig. 1.

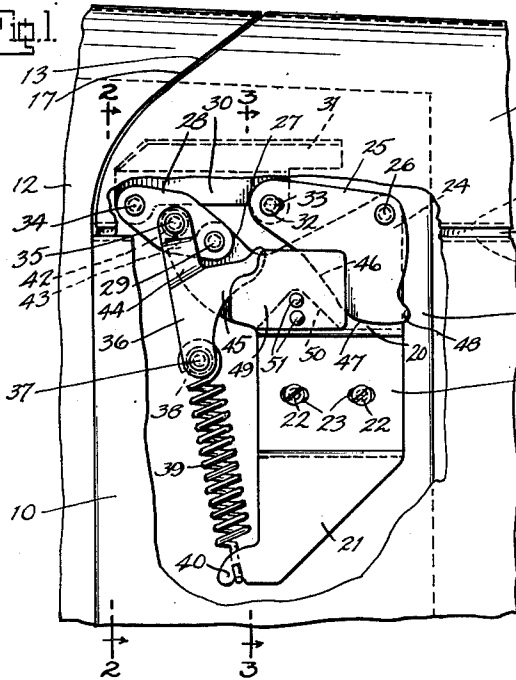


Fig. 2.

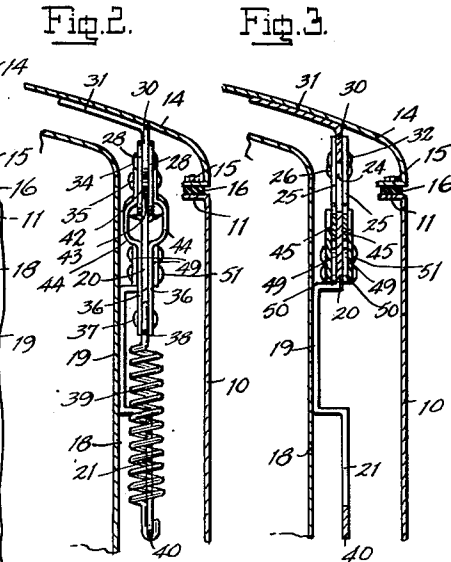


Fig. 3.

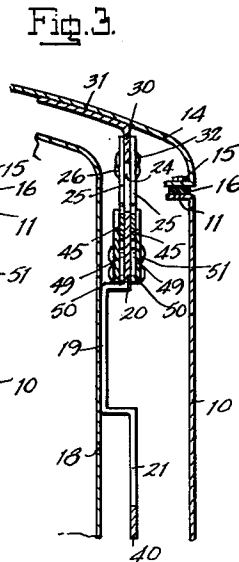


Fig. 4.

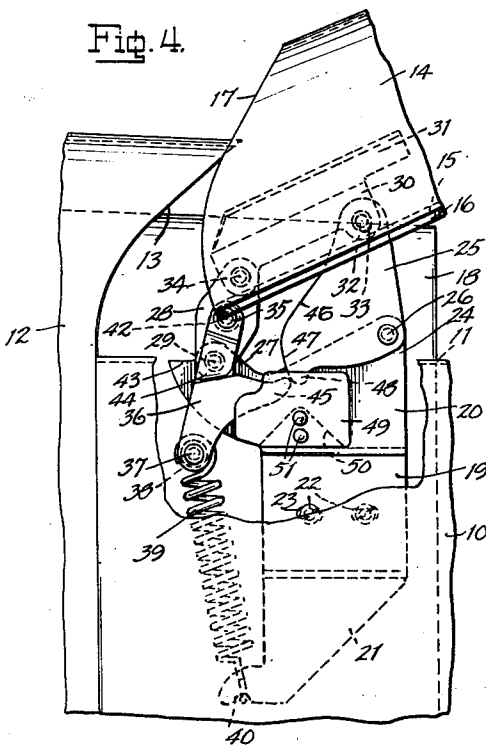
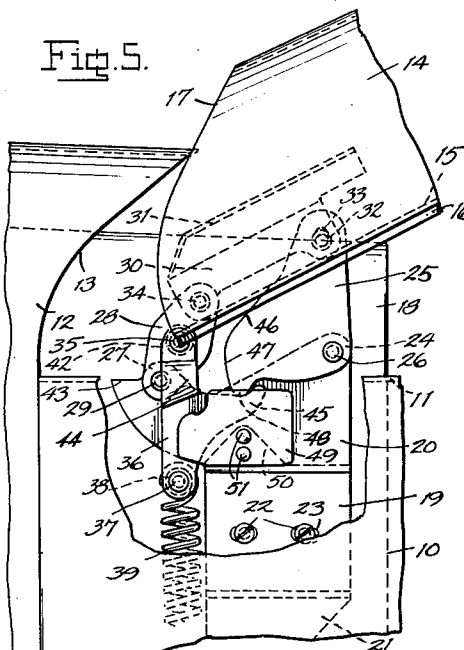


Fig. 5.



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COMPENSATING HINGE STRUCTURE FOR
AUTOMOBILE HOODS OR THE LIKEArthur Claud-Mantle, Trumbull, Conn., assignor
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4 Claims. (Cl. 16—146)

The present invention relates to a compensating hinge structure for automobile hoods or the like, and particularly hoods of the so-called alligator type which are hinged at their rearward ends and are held in closed position by the hood catch at the forward end. In hoods of this type the edges of the cowl and the hood are usually curved forwardly from the vertical side edges toward the center of the top, and in swinging the hood into open position it is important that the rearward edge of the hood have a movement forwardly and upwardly with respect to the forward edge of the cowl so that it will clear the cowl during the opening movement and there will be no chance of marring the finish. To this end it is an object of the invention to provide means which will cause the rearward edge of the hood to describe a predetermined and differential path.

A further object of the invention is to provide compensating hinge means which will effectively retain the hood in closed position under spring pressure, maintaining the hood tightly in relation to the side closure structure of the engine compartment against looseness and vibration, and which will permit the hood to be raised with facility. In particular it is proposed to provide hinge means which will offer only very slight resistance after the initial opening movement is imparted to the hood, and in which spring means employed to normally retain the hood closed will assist in moving the hood to open position after the opening movement has been manually started. It is also proposed to provide detent locking means which will support the hood in open position so that there will be no chance of it accidentally closing, but which may be released with relatively little manual effort.

With the above and other objects in view, an embodiment of the invention is shown in the accompanying drawing, and this embodiment will be hereinafter more fully described with reference thereto, and the invention will be finally pointed out in the claims.

In the drawing:

Fig. 1 is a side elevation of a portion of the engine compartment and cowl, and the rearward portion of the hood, the latter being partially broken away to show the hinge means at one side of the hood.

Fig. 2 is a vertical sectional view taken along the line 2—2 of Fig. 1.

Fig. 3 is a vertical sectional view taken along the line 3—3 of Fig. 1.

Fig. 4 is a side elevation, similar to Fig. 1, and showing the hood in an intermediate position during the raising operation.

Fig. 5 shows the hood fully raised and supported by the hinge means.

Similar reference characters indicate corresponding parts throughout the several figures of the drawing.

Referring to the drawing, the hinge structure according to the invention is adapted to be employed in connection with an alligator type hood for enclosing an engine compartment having fixed sides 10, provided at each of their upper edges with an inwardly bent ledge flange 11 disposed horizontally and upon which the respective lower edge of the hood at each side is adapted to seat in closed position, and a cowl 12, the upper portion of which extends over the rearward portion of the engine compartment and has its forward edge 13 curved forwardly toward the center line of the hood. The hood 14 is provided at each of its lower edges with an inwardly bent flange 15 to which a resilient sealing strip 16 is secured, and which strips are adapted to seat upon the ledges 11 of the sides 10, the rearward edge 17 of the hood being shaped to conform to the edge 13 of the cowl, so that in the closed position the hood is substantially continuous with the cowl surface. Within the rearward part of the engine compartment an inner cowl structure 18 is provided, the side walls of which are inwardly spaced from the sides 10 and the upper wall of which is downwardly spaced from the upper portion of the cowl 12 and the hood.

The hinge structures, according to the invention are mounted upon the side walls of the inner cowl structure 18 and are connected to the hood at each side, these hinge structures at each side being of identical construction but in reverse relation to each other. For the sake of clearness of illustration and description, therefore, only the hinge structure at one side is shown.

A bracket consisting of an inwardly offset portion 19 and upwardly and downwardly extending outwardly offset portions 20 and 21 is rigidly secured to the wall 18 by means of bolts 22 engaged through slots 23 in the portion 19, these slots being horizontally disposed so as to permit a slight longitudinal adjustment of the bracket. The upwardly extending portion 20 of the bracket is provided with a forwardly disposed upwardly projecting pivot supporting portion 24, at each side of which a link member 25 is pivotally secured by a rivet pin 26, and with a rearwardly

projecting pivot supporting portion 27, at each side of which a link member 28 is pivotally secured by means of a pivot pin 29. The link members 25 are pivotally connected to the forward end of a bracket 30 secured to the hood by means of a flange 31 bent from the upper portion of the bracket, which may be welded or otherwise attached to the under surface of the hood, the connection between the link members 25 and the bracket being provided by means of a rivet pin 32 in the bracket engaged in slots 33 in the link members 25, these slots being horizontally disposed in the closed position, as shown in Fig. 1. The link members 28 are pivotally connected to the rearward end of the bracket 30 by a rivet pin 34.

It will be noted that the pivot axes provided by the rivet pins 32 and 34 are disposed in a horizontal plane in the closed position of the hood, that the axis of the pivot pin 26 is in a plane above the plane of the pivot axis of the pin 29, and that the lengths of the link members 25 is greater than that of the link members 28. These points are predetermined to cause the rear edge of the hood as it is raised to move forwardly away from the edge 13 as the hood is raised, the lower ends of the edge 17 moving forwardly and upwardly in a relatively low angle outside arc and the central upper portion of the edge 17 moving first forwardly and upwardly and then slightly rearwardly in a relatively high angle inside arc.

Centrally of the link members 28—28 and at each of their outer sides there are pivotally connected by means of a rivet pin 35, the upper ends of a pair of detent levers 36—36 the lower ends of these levers being connected by a rivet pin 37 upon which there is provided between the levers a spacing washer 38, and over which there is engaged the upper hooked end of a helical spring 39, the lower hooked end of which is connected to the notched projecting finger portion 40 of the lower portion 21 of the bracket. A spacing washer 42 is provided upon the pivot pin 35 between the link members 28—28, and in the closed position of the hood is disposed above a projecting abutment portion 43 provided upon the rearward end of the upper portion 20 of the bracket, and which acts as a limit stop, after a predetermined compression of the sealing strip 16, this strip however normally preventing engagement of the washer 42 with the abutment portion 43. The detent levers 36 are outwardly bowed adjacent their upper ends, as at 44, so as to provide a clearance space for the head ends of the rivet pin 29 in the open position of the hood shown in Figs. 4 and 5.

The detent levers 36 are each provided with a forwardly projecting detent finger 45 having its forward end extending upwardly at a slight incline and which is adapted to cooperate with the link members 25 in the open position of the hood, the link members 25 each being provided for this purpose with a cam surface 46 which rises gradually with respect to the axis of the pivot pin 26 and terminates in a concentric portion 47, at the end of which there is provided a detent locking projection 48 for locking cooperation with the detent lever finger 45, as will hereinafter more fully appear.

It will be noted that the link members 25—25 and the detent levers 36—36 are disposed at each side of the bracket portion 20 and in order to maintain them in parallel sliding relation therewith there is provided at each side of the

bracket portion 20 a retaining plate 49 spaced outwardly from the portion 20 by spacer blocks 50, the plates and the spacer blocks being secured to the bracket portion 20 by means of rivets 51.

The operation is as follows:

In the closed position of the hood the spring 39 exerts a straight line pull upon the detent levers 36 which in turn draw the link members 28 downwardly about the pivot 29, this pull being sufficient to hold the hood securely at its rearward end, the forward end being held downwardly by means of the usual hood catch provided upon the forward end of the hood. Any slight irregularity in the seating relation between the sides 10 and the hood is compensated for by the slots 33 which permits of a slight movement of the hood about the pivot pin 34. In order to open the hood the forward end is swung upwardly causing the link members 25 and 28 to swing forwardly in clockwise direction.

As the hood approaches the open position the forward ends of the detent fingers 45 engage the cam surfaces 46 swinging the detent levers 36 in clockwise direction about the pivot pin 35 holding the levers as they move along the concentric cam portions 47 so that during the continued swinging of the link members 25 and 28 there is no appreciable spring resistance to the opening movement of the hood.

As the hood reaches the fully open position the locking projections 48 of the link members 25 snap past the ends of the detent fingers 45 releasing the detent levers 36 so that they are swung forwardly into detent locking position beneath the link members 25, and in which position they are held by the relatively strong pull of the spring 39, which pull is now a straight line pull along the detent levers 36, this straight line pull being forward of the center of the pivot pin 29, so that the link members 28 tend to rotate in clockwise direction thereby maintaining the hood in open position, the rearward end of the bracket 30 being pulled downwardly by the link members 28 and the link members 25 supporting the forward end of the bracket as fulcrums, these link members being in turn supported by the locking detent provided by the detent levers 36.

It will be noted that during the opening movement the pivot pins 32 engage with the outer ends of the slots 33 as shown in Fig. 4 but when released will seat upon the inner ends as shown in Fig. 5.

In order to close the hood a downward force is exerted upon the forward open end, this force being sufficient to overcome the pull of the spring 39, so that the link members 25 and 28 move in counter-clockwise direction. This first releases the detent lock provided by the detent fingers 45, and as soon as the pull of the spring is past the dead center of the pivot pin 29 the spring exerts its force to swing the links 25 and 28 in counter-clockwise direction to bring the hood to closed position.

I have illustrated and described a preferred and satisfactory embodiment of the invention, but it will be understood that changes may be made therein, within the spirit and scope thereof as defined in the appended claims.

Having thus described my invention what I claim and desire to secure by Letters Patent is:

1. A hinge structure for an automobile hood or the like, comprising a supporting bracket adapted to be secured to a fixed part, a swinging

bracket adapted to be secured to the hood near its rearward edge, a pair of link members longitudinally spaced with respect to the hood pivotally connected to said supporting bracket at longitudinally spaced points and pivotally connected to said hood bracket at longitudinally spaced points, the rearward link member being shorter than the forward link member whereby differential swinging movement is imparted to the forward and rear ends of said swinging bracket, a detent lever pivotally connected to said rearward link member at a point spaced from its pivotal connection with said supporting bracket, spring means connected to said detent lever normally retaining said link member in hood closing position through force exerted in a line at one side of said pivotal connection and adapted in the open position of the hood to exert a force at the other side of said pivotal connection to maintain the hood in open position, a detent catch part carried by said detent lever, and a detent catch part carried by said forward link member adapted to be engaged by said detent catch part of said detent lever in said open position under the force of said spring means.

2. A hinge structure for an automobile hood or the like, comprising a supporting bracket adapted to be secured to a fixed part, a swinging bracket adapted to be secured to the hood near its rearward edge, a pair of link members longitudinally spaced with respect to the hood pivotally connected to said supporting bracket at longitudinally spaced points and pivotally connected to said hood bracket at longitudinally spaced points, the rearward link member being shorter than the forward link member whereby differential swinging movement is imparted to the forward and rear ends of said swinging bracket, a detent lever pivotally connected to said rearward link member at a point spaced from its pivotal connection with said supporting bracket, spring means connected to said detent lever normally retaining said link member in hood closing position through force exerted in a line at one side of said pivotal connection and adapted in the open position of the hood to exert a force at the other side of said pivotal connection to maintain the hood in open position, a detent projection carried by said detent lever in spaced relation to its pivoted connection, disposed substantially at an angle to the normal force line of said spring, and a detent catch part carried by said forward link member adapted to be engaged by said detent projection in said open position under the force of said spring means.

3. A hinge structure for an automobile hood or the like, comprising a supporting bracket adapted to be secured to a fixed part, a swinging bracket adapted to be secured to the hood near

its rearward edge, a pair of link members longitudinally spaced with respect to the hood pivotally connected to said supporting bracket at longitudinally spaced points and pivotally connected to said hood bracket at longitudinally spaced points, the rearward link member being shorter than the forward link member whereby differential swinging movement is imparted to the forward and rear ends of said swinging bracket, a detent lever pivotally connected to said rearward link member at a point spaced from its pivotal connection with said supporting bracket, spring means connected to said detent lever normally retaining said link member in hood closing position through force exerted in a line at one side of said pivotal connection and adapted in the open position of the hood to exert a force at the other side of said pivotal connection to maintain the hood in open position, a detent projection carried by said detent lever in spaced relation to its pivotal connection, disposed substantially at an angle to the normal force line of said spring, a cam part carried by said forward link member adapted to engage said detent projection to swing said detent lever in one direction during opening of said hood against the force of said spring means, and a detent catch part at the end of said cam part adapted to be engaged by said detent projection through swinging of said detent lever in the other direction under the force of said spring means.

4. A hinge structure for an automobile hood or the like, comprising a supporting bracket adapted to be secured to a fixed part, a swinging bracket adapted to be secured to the hood near its rearward edge, a pair of link members longitudinally spaced with respect to the hood pivotally connected to said supporting bracket and swinging bracket at longitudinally spaced points, the pivotal connection of the rearward link member with said swinging bracket being a fixed connection and the pivotal connection of the forward link member with said swinging bracket being a floating slot and pin connection, whereby said hood has a limited swinging movement about said fixed connection with respect to said floating slot and pin connection. the rearward link member being shorter than the forward link member whereby differential swinging movement is imparted to the forward and rear ends of said swinging bracket, spring means connected to said rearward link member at a point spaced from its pivotal connection with said supporting bracket normally retaining said link member in hood closing position through force exerted in a line at one side of said pivotal connection and adapted in the open position of the hood to exert a force at the other side of said pivot connection to maintain the hood in open position.

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