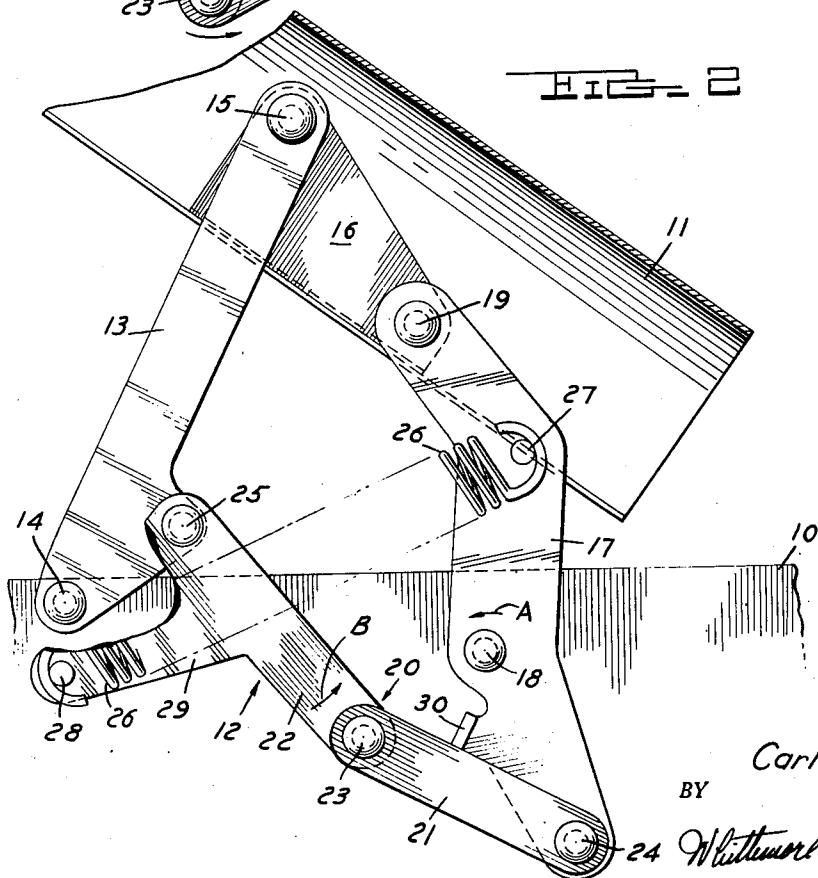


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## HINGE ASSEMBLY

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This invention relates generally to hinge assemblies, and refers more particularly to improvements in hinge assemblies having a plurality of articulated links arranged to afford a highly effective connection for a vehicle body hood or deck closure.

It is an object of this invention to provide a relatively simple, inexpensive hinge assembly for an upwardly swinging closure which causes one edge of the closure to shift forwardly as it is raised from its seat and which embodies spring controlled means for effectively holding the closure in its raised position.

It is another object of this invention to provide a hinge assembly of the above general type having linkage cooperating with the spring means to effectively hold the closure in its raised position, and at the same time, to enable lowering the closure with a minimum effort on the part of the operator.

The foregoing as well as other objects will be made more apparent as this description proceeds, especially when considered in connection with the accompanying drawing, wherein:

Figure 1 is a semidiagrammatic side elevational view, partly in section, of a hinge assembly embodying the features of this invention with the spring partly broken away and showing the several parts of the assembly in the relative positions they assume when the closure is in its closed position; and

Figure 2 is a view similar to Figure 1 showing the various parts of the hinge assembly in the relative positions they assume when the closure is swung to its open position, the spring and one of the links being broken away.

In the drawing the numeral 10 designates a fixed part of a vehicle body, and the numeral 11 indicates a closure such for example, as the hood for the engine compartment. The hood is pivoted to the body by hinge assemblies respectively supported at opposite sides of the hood. These hinge assemblies are of a design not only to permit upward swinging movement of the front edge of the hood, but also to compel the hood to shift forwardly sufficiently to enable the rear edge of the hood to clear the seat provided therefor on the body.

One hinge assembly embodying the features of this invention is designated in the drawing by the numeral 12. In detail the hinge assembly 12 has an arm 13 pivoted at its lower end to the body by a pin 14 and pivoted at its upper end to the hood by a pin 15 supported on a bracket 16. The bracket 16 is suitably secured to the hood at one

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side of the latter, and is spaced forwardly from the rear edge of the hood 11.

The hood 11 is also connected to the body 10 by a second arm 17 pivotally connected intermediate the ends to the body 10 by a pin 18 spaced rearwardly and downwardly from the pivot pin 14 for the arm 13. The upper end of the arm 17 is pivoted to the bracket 16 by a pin 19 spaced rearwardly and downwardly from the pivot pin 15 for the arm 13.

The lower end of the arm 17 is connected to the arm 13 by toggle linkage 20 having a pair of links 21 and 22 pivotally connected at adjacent ends by a pivot pin 23. The outer end of the link 21 is pivoted to the lower end of the arm 17 by a pin 24, and the outer end of the link 22 is pivoted to the arm 13 intermediate the ends of the latter by a pin 25.

The hood 11 is yieldably held in its raised position shown in Figure 2 of the drawing by a coil spring 26 having the rear end anchored on a pivot pin 27 supported on the arm 17 intermediate the pivot pins 18 and 19. The front end of the spring 26 is anchored on a pin 28 supported on the toggle link 22. In this connection it will be noted that the toggle link 22 has a forwardly extending part 23 intermediate the ends and the pin 28 is fixed to this part.

It is apparent from Figure 2 of the drawing that when the closure or hood 11 is in its raised position, the toggle linkage 20 assumes a substantially extended or straight line position determined by the stop 30 provided on the arm 17 between the pivot pins 18 and 24. Also in the raised position of the hood 11, the spring 26 tends to swing the arm 17 about the pivot pin 18 in the direction of the arrow A, and tends to swing the adjacent pivoted ends of the toggle links in the direction of the arrow B. Thus the spring 26 yieldably urges the toggle linkage to its extended or substantially straight line position, and holds the hood in its raised position.

In Figure 1 of the drawing, it will be noted that in the closed position of the hood 11, the anchor pin 28 assumes a position above the pivot pin 25 and forwardly of the pivot pin 14. The anchor pin 27 on the other hand is spaced above the fixed pivot pin 18 to the rear of the latter, so that the line of action 32 of the spring actually extends above both pivot pins 18 and 25. Such an arrangement causes the spring 26 to impart a force on the arm 17 tending to swing this arm about the pivot pin 18 in a direction to raise the hood 11. However, it will be observed that the pivot pin 25 is spaced a greater distance below

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the line of action 32 of the spring than the pivot pin 18, so that the spring force applied to the anchor pin 28 resists upward swinging movement of the toggle link 22 and counteracts the force applied by the spring 26 on the pin 27 tending to raise the hood. Thus the hood is actually held in its closed position by the spring 26.

The advantage obtained by the above arrangement is that very little effort is required on the part of the operator to raise and lower the hood. Also the above pivot arrangement, together with the toggle linkage 20, renders it possible to provide highly satisfactory operation with a lighter spring and reduces the extent of spring travel during operation of the hinge.

What I claim as my invention is:

1. A hinge assembly for connecting a closure part to a supporting part permitting vertical swinging movement of the closure part relative to the supporting part, comprising first and second arms extending in fore and aft relationship one above the other in the closed position of said closure part, a first pivot for pivotally connecting the front end of the first arm to the supporting part, a second pivot for pivotally connecting the rear end of the first arm to the closure part, a third pivot for pivotally connecting the second arm intermediate the ends thereof to the supporting part; a fourth pivot for pivotally connecting the rear end of the second arm to the closure part, a toggle joint between said arms arranged in its folded position in the closed position of the closure part and comprising first and second links having the adjacent ends pivotally connected together, a fifth pivot for pivotally connecting the outer end of said first toggle link to the first arm intermediate the ends thereof, a sixth pivot for pivotally connecting the outer end of the second toggle link to the front end of the second arm, a coil spring having its rear end connected to the second arm between the third and fourth pivots, and means connecting the front end of the spring to the first toggle link intermediate the ends thereof at an elevation spaced above the fifth pivot in the closed position of the closure part whereby the line of action of the coil spring in the closed position of the closure part extends above both the third and fifth pivots.

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tion of the closure part whereby the line of action of the coil spring in the closed position of the closure part extends above both the third and fifth pivots.

2. The hinge assembly defined in claim 1 wherein the fifth pivot is spaced a greater distance below the line of action of the coil spring than the third pivot when the closure part is in its closed position to counteract the force applied by the spring to the second arm tending to raise the closure part.

3. The hinge assembly defined in claim 1 wherein the first toggle link has a portion intermediate the ends thereof which extends forwardly beyond the first pivot in the closed position of the closure part and wherein the front end of the coil spring is anchored on said portion of the first toggle link forwardly of said first pivot.

4. The hinge assembly defined in claim 1 wherein the fourth pivot is spaced rearwardly and downwardly from the second pivot in the closed position of the closure part.

5. The hinge assembly defined in claim 1 wherein the toggle joint is moved toward its extended position when the closure part is swung to its raised position and wherein the line of action of the coil spring moves across the fifth pivot to a position below the latter upon initial movement of the closure part toward its raised position.

6. The hinge assembly defined in claim 5 having a stop on one of the arms in a position to engage the toggle joint and limit the extent of movement of the closure part toward its raised position.

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