May 1, 1956 A. R. TURNER 2,743,476

LIFT HINGE FOR AUTOMOBILES

Filed July 20, 1950 2 Sheets-Sheet 1

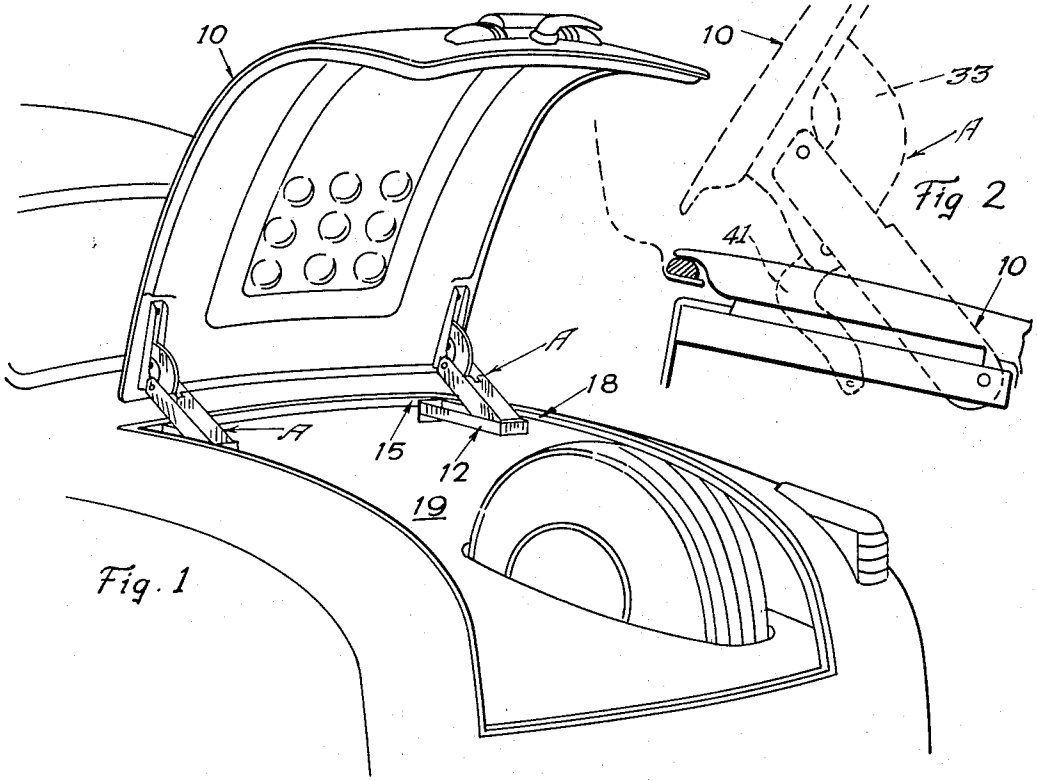


Fig. 1

Fig 2

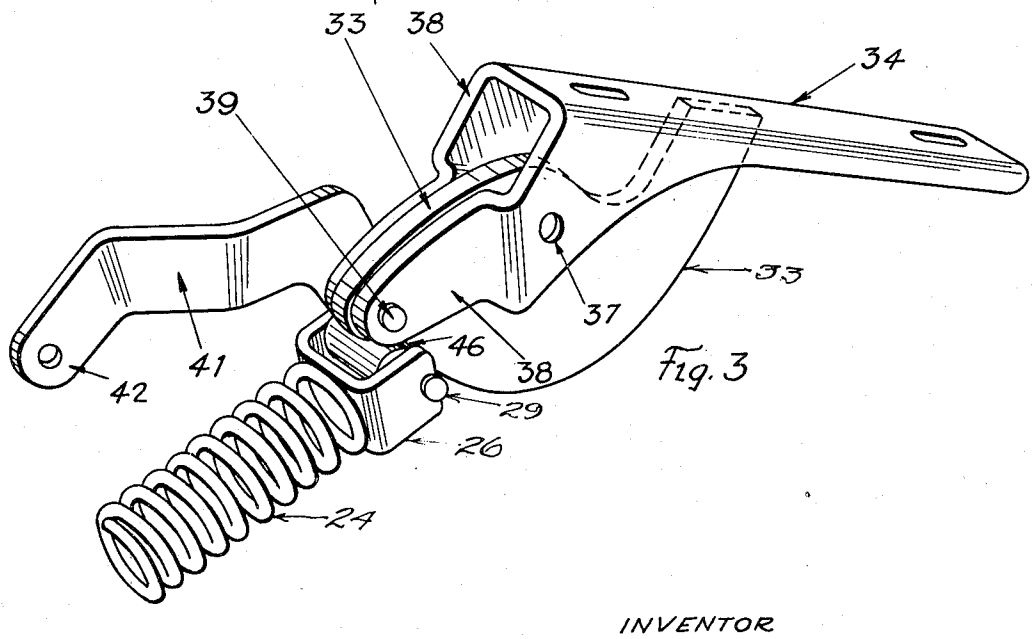


Fig. 3

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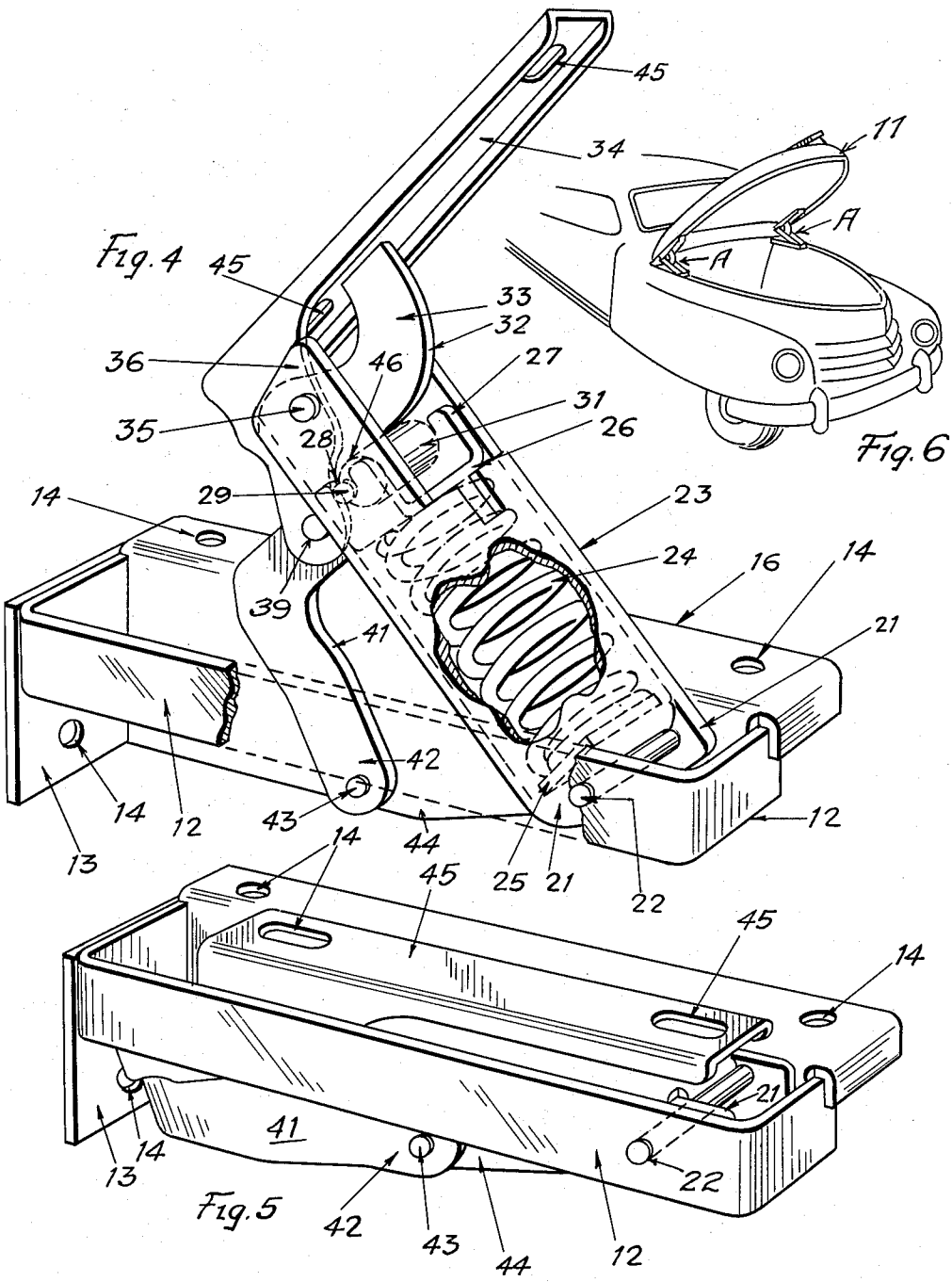
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LIFT HINGE FOR AUTOMOBILES

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6 Claims. (Cl. 16—141)

The present invention relates to a hinge construction and especially to a novel hinge assembly for pivotally mounting a cover member or closure such as those employed for the rear deck or trunk as well as the hood of an automobile.

Among the objects of the present invention is the provision of a novel hinge assembly for pivotally mounting a cover member or closure for an automobile about a horizontal axis and automatically retaining this cover member or closure in any position or degree of opening.

The present invention further comprehends the provision of a novel counter-balanceing hinge construction that maintains the cover member or closure counter-balanced in any position between completely closed and fully open. By reason of this novel hinge arrangement, a positive finger-tip control is provided so that the cover member or closure may be easily and quickly elevated or lowered by the expenditure of a minimum of effort and positively maintained in its adjusted position.

In the novel embodiment of the present invention, the cover member or closure is spring-loaded in all positions of movement from closed to fully open position, but is maintained in any position to which it is moved until manual effort again moves it from that position. This cover member or closure functions as a lever to compress the spring when the cover or closure is moved to its lowered, closed position, and the compressed spring is employed to help or augment the lifting effort in the raising of the cover or closure when manually moved to an elevated, open position. Thus the effect of gravity is counter-balanced with the cover or closure automatically held in any position to which it is moved or adjusted, and only a small external force is required to raise or lower it from its closed or open positions or to change its position.

It will thus be evident that the present invention effectively eliminates any danger of the cover member or closure from swinging toward open position or from dropping toward closed position when released from a fully or partially open position.

Another important object of the present invention is the provision of a novel lift hinge construction which permits the cover member or closure to be moved from closed position through an arc of approximately 90° to open position and thereby give maximum access to the trunk or compartment when the cover member or closure is in fully open position. By reason of the novel construction and arrangement, when the cover member or closure is fully open, the greater portion of the weight thereof is disposed directly over the pivot point of the cam arm.

A further object is the provision in the novel lift hinge assembly of the present invention, of a novel means of pivotally mounting the cover member or closure in such manner that when it is moved from its closed position to an open position, its initial movement is in a substantially horizontal plane for a considerable height before it moves through an arcuate path to fully open position.

Thus when this novel hinge is used to pivotally mount a deck lid or closure for a trunk or hood the hinge assembly permits maximum utility of the available space beneath the closure.

Yet another object of the present invention is the provision of a novel hinge assembly that is extremely compact and is mounted upon the encompassing shell of the automobile body at the opposite sides of the opening of the trunk or compartment. As most hinge constructions and especially those now employed with the rear deck or lid for the trunk, require a pair of elongated springs and support mountings disposed beneath the shell of the body and beneath and rearwardly of the rear windows of the automobile, it has not been practicable to mount the rear window closely adjacent the rear deck or trunk lid. And in convertibles, the prior springs and their support mountings require space beneath the shell of the body that should be available to receive the convertible top when in lowered position. By the present invention this objection has been completely obviated as no part of the hinge extends beneath the space or shell of the body forwardly of the trunk opening, but is disposed in the opposite corners and laterally of the opening.

Another important feature of the present invention is that the hinge mounting and assembly is disposed laterally of the trunk or hood opening and adjacent the upper corners thereof so that the opening is unobstructed. Furthermore, no part of the hinge assembly in open or in closed position projects beneath the stationary mounting support. Thus there is provided an unobstructed interior which greatly augments the available space in the compartment of the trunk or beneath the hood of an automobile.

A further object is the provision of a novel means and manner of mounting this lift hinge assembly in the body of an automobile at the opposite sides of the opening adapted to be closed by the cover member or closure. This mounting is accomplished in the most rigid portion of the trunk area available where there is provided suitable means such as a channelled or ribbed bar or strap for reenforcing the shell of the automobile.

Further objects are to provide a construction of maximum simplicity, efficiency, economy and ease of assembly and operation, and such further objects, advantages and capabilities as will later more fully appear and are inherently possessed thereby.

The invention further resides in the construction, colbination and arrangement of parts illustrated in the accompanying drawings, and while there is shown therein a preferred embodiment, it is to be understood that the same is susceptible of modification and change, and comprehends other details, arrangements of parts, features and constructions without departing from the spirit of the invention.

In the drawings:

Figure 1 is a fragmentary view in perspective of the rear of an automobile with the trunk closure or deck lid in raised or open position to disclose the construction and arrangement of the present novel lift hinge assembly when applied to the trunk or rear compartment.

Fig. 2 is a fragmentary view, part in side elevation and part in vertical cross-section, showing in full lines the trunk closure or deck lid and lift hinge in closed position and in dotted outline the closure or lid and lift hinge in fully open or elevated position.

Fig. 3 is a partially disassembled view in perspective of the novel hinge construction.

Fig. 4 is a perspective view of the complete hinge assembly with parts of the spring housing and mounting or supporting bracket broken away for clearer illustration, and showing the position of the component parts when the lid or closure is in a raised or open position.

Fig. 5 is a perspective view of the hinge assembly and showing the position of the component parts when the lid or closure is in its lowered or closed position.

Fig. 6 is a fragmentary perspective view showing the novel lift hinge applied to the hood of an automobile.

Referring more particularly to the disclosure in the drawing and to the novel embodiment selected to illustrate the present invention, the novel lift hinge assembly is shown as employed in pivotally mounting a cover member or closure such as the trunk deck lid **10** or the hood **11** for an automobile (Fig. 6). The novel hinge construction A comprises a hollow mounting frame or supporting bracket **12** having a rear mounting plate **13** provided with one or more openings **14** for attachment to a tranverse supporting member **15** by bolts, screws or other attaching means. The mounting frame or supporting bracket is provided with a laterally projecting and longitudinally extending anchoring flange **16** adapted to be attached to the underside of the shell of the automobile body along an edge **18** of the access opening of the trunk compartment **19**, and provided with suitably spaced openings **14** for the reception of anchoring bolts, screws or other attaching means.

Pivotally mounted by means of its spacing bifurcations or ends **21** within the hollow of the mounting frame or supporting bracket **12** and upon a transverse pivot pin **22** journalled in the spaced sides of the frame or bracket, is a housing **23**. This housing provides an enclosure for receiving a compression or coil spring **24** seating at its lower end against a flange or abutment **25** provided at the base of the housing and disposed adjacent the pivot **22**. At its upper end the coil spring seats against a cam follower shown as comprising a substantially U-shaped slide or yoke **26** having its opposite, spaced arms **27** slotted at **28** to freely receive the ends of a pin **29** carrying a roller or follower **31** maintained in contacting engagement with the cam face **32** of a cam **33**.

The cam **33** is secured to and carried by a cam arm **34** pivotally mounted adjacent one end upon a pivot pin **35** carried by the bifurcations or spaced members **36** of the housing **23**. This pivot pin **35** projects through aligned openings **37** in the bifurcations or spaced projecting ends **38** of the cam arm **34** and which bifurcations or ends are bent inwardly to conformably receive and retain the cam **33** in the manner shown in Fig. 3. A pivot pin **39** projects through the ends of the bifurcations or spaced projecting ends **38** and to an end of this pin **39** is pivotally secured an end of a control arm **41**, the other end **42** of this control arm being pivotally mounted upon a pivot pin or rivet **43** in a depending side wall **44** of the mounting frame or supporting bracket **12**.

The cam arm **34** is attached to the underside of the cover member or closure **10** for the trunk, and to permit limited longitudinal adjustment of this mounting the arm **34** is provided with spaced slots **45** for the reception of attaching bolts, screws or the like.

The face **32** of the cam **33** is so contoured and related to the cam follower that the cover member or closure is maintained counter-balanced in any position between closed and fully open position, and to lock the cover member or closure in fully open position the cam is provided with a concavity **46** in which the roller or cam follower **31** seats or dwells. If desired, a concavity adjacent the end of the cam where it abuts the underside of the cam arm **34** may be provided if it is desired to lock the cover member or closure in fully closed position. By adjusting the position of the pivot **43** of the control arm or link **41** along the side wall **44**, it will be appreciated that the degree of opening of the cover member or closure may be altered as this control arm or link governs the path of movement of the movable parts.

From the above description and the disclosure in the drawings, it will be appreciated that the present invention comprehends a novel lift hinge in which the cover member or closure may be quickly elevated or lowered by the expenditure of a minimum of manual effort and positively maintained in any desired adjusted position between closed and fully open.

Having thus disclosed the invention, I claim:

1. A lift hinge assembly for pivotally mounting a cover member upon the body of an automobile in such manner as to retain the cover member counter-balanced in any position between fully closed and fully open positions, said hinge assembly including a hollow mounting frame adapted to be fixed to the body, a housing pivotally mounted adjacent one end within the hollow and adjacent one end of the mounting frame, a cam arm adapted to be affixed to the cover member, means for pivotally connecting the cam arm adjacent one end thereof to an end of the housing, a cam carried by the cam arm and provided with a cam face, a cam follower slidably mounted in the housing and provided with a roller in contacting engagement with the cam face, a compression spring carried in the housing and in engagement with said cam follower to force the roller against and maintain it in continuous pressure engagement with the cam face, said cam, cam follower and spring being so constructed and arranged as to counter-balance the weight of the cover member and maintain it in any position to which it is manually moved, and a concavity in the cam face to receive the roller when the cover member is moved to closed position.

2. A lift hinge for pivotally mounting a cover member for an access opening upon a support whereby the cover member is adapted to be lowered to close said opening or to be raised and permit access to said opening, said lift hinge comprising a hollow frame adapted to be mounted on the support, a housing member pivotally mounted at one end within said frame and provided with an abutment, a compression spring and a cam follower carried by and slidably mounted in said housing member with one end of the spring bearing against the follower and the other end against the abutment, a cam arm adapted to be carried by the cover member, means for pivotally connecting an end of the cam arm to said housing member, and a cam carried by the cam arm and having a cam face with the cam follower maintained in continuous pressure engagement with the cam face by said compression spring whereby to maintain the cover member counter-balanced in any position between fully closed and fully open positions.

3. A lift hinge adapted for pivotally mounting a closure for an access opening upon a fixed support whereby the closure is adapted to be lowered to close said opening or to be raised and permit access to said opening, and maintained in any position to which it is manually moved, said lift hinge comprising a hollow supporting bracket adapted to be mounted on the support, a member pivotally mounted at one end in one end of the bracket, a compression spring and a cam follower carried by and slidably mounted in said member, a cam arm adapted to be carried by the closure and having spaced projections at one end, means for pivotally connecting the projections on said arm to said member, a cam carried by the arm between said projections and having a cam face along one edge with the cam follower maintained in continuous pressure contact with the cam face by said compression spring, and a movable control arm pivotally connected at one end to the cam arm at a point spaced from the pivotal connection connecting the cam arm to said member and at its other end said control arm is pivotally connected to said supporting bracket whereby to govern the path of movement of the cam arm as said closure is raised and lowered.

4. A lift hinge for pivotally mounting a cover member for an opening in the body of an automobile, comprising a stationary frame adapted to be secured to the body, a housing member pivotally mounted at one end in the

frame, a spring carried in the housing member, a cam follower slidably mounted in the housing member and actuated by the spring, an arm member adapted to be secured to the cover member and pivotally mounted adjacent one end upon the other end of the housing member, a cam carried by the arm member and having a cam face in engagement with the cam follower and maintained in continuous pressure engagement by the spring, and a movable control arm pivotally connected at one end to the frame and at its other end to the cam arm at a point spaced from the pivotal mounting of the arm member upon the housing member for governing the movement of the cam arm and the degree of opening of the cover member, said cam face, cam follower and spring being so constructed and arranged as to counterbalance the weight of the cover member and maintain it in any position to which it is manually moved, and a concavity in the cam face for receiving the cam follower when the cover member is closed.

5. A lift hinge for pivotally mounting a closure upon a support whereby the closure is adapted to be lowered to close an access opening to a compartment or to be raised and permit access to said opening and maintained in any position to which it is manually moved, said lift hinge comprising a supporting bracket adapted to be mounted on the support, a member pivotally mounted upon the bracket, a compression spring and a cam follower slidably mounted within and carried by said member, an arm adapted to be carried by the closure and provided with depending projections at one end thereof, means for pivotally connecting the depending projections of said arm to said member, a cam carried by the arm between said projections and provided with a cam face with the cam follower maintained in continuous pressure contact with the cam face by said compression spring, and a movable control arm connected at one end to the supporting bracket and at its opposite end to the depending projections of said arm at a point spaced from the pivot connecting said arm to said member for governing the path of movement of the arm.

6. A lift hinge for pivotally mounting a cover member upon a support whereby the cover member is adapted to be lowered to close an opening or to be raised and permit access to said opening, said lift hinge comprising a hollow frame adapted to be fixed to the support, a housing member pivotally mounted at one end in said frame, a compression spring and a cam follower carried by said housing member with the cam follower slidable therein, a cam arm adapted to be adjustably mounted upon the cover member, means for pivotally connecting the cam arm to the other end of said housing member including depending bifurcations on an end of said cam arm mounted within spaced sides of the housing members, and a cam mounted on said cam arm between its bifurcations and having a cam face with the cam follower maintained in continuous pressure contact with the cam face by the compression spring whereby to maintain the cover member counter-balanced in any position between fully closed and fully open positions.

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