July 26, 1938. J. H. ROETHEL 2,125,247

CHECK ARM

Filed June 22, 1936 2 Sheets-Sheet 1

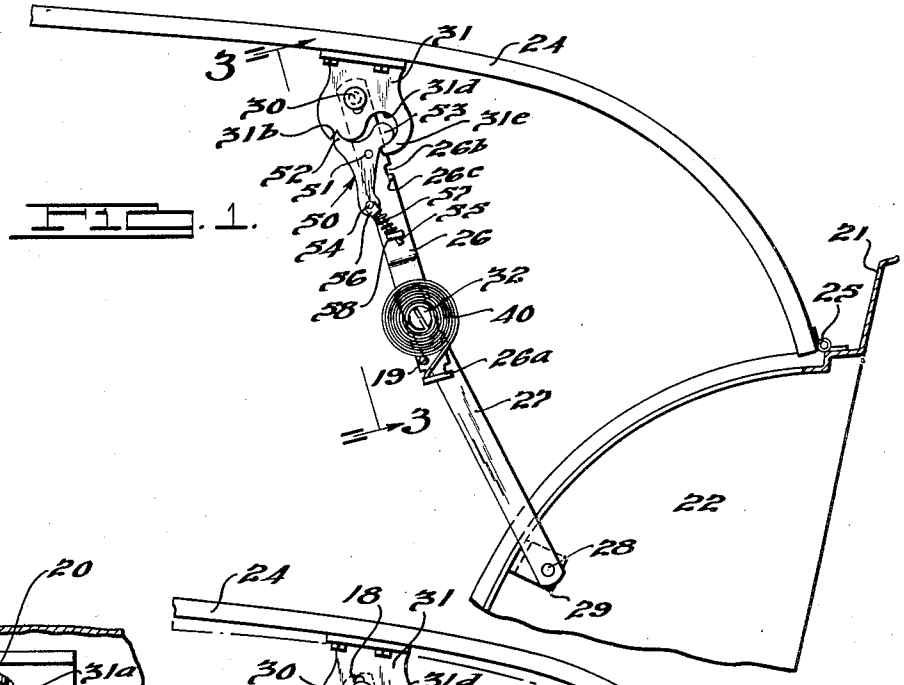


FIG. 1.

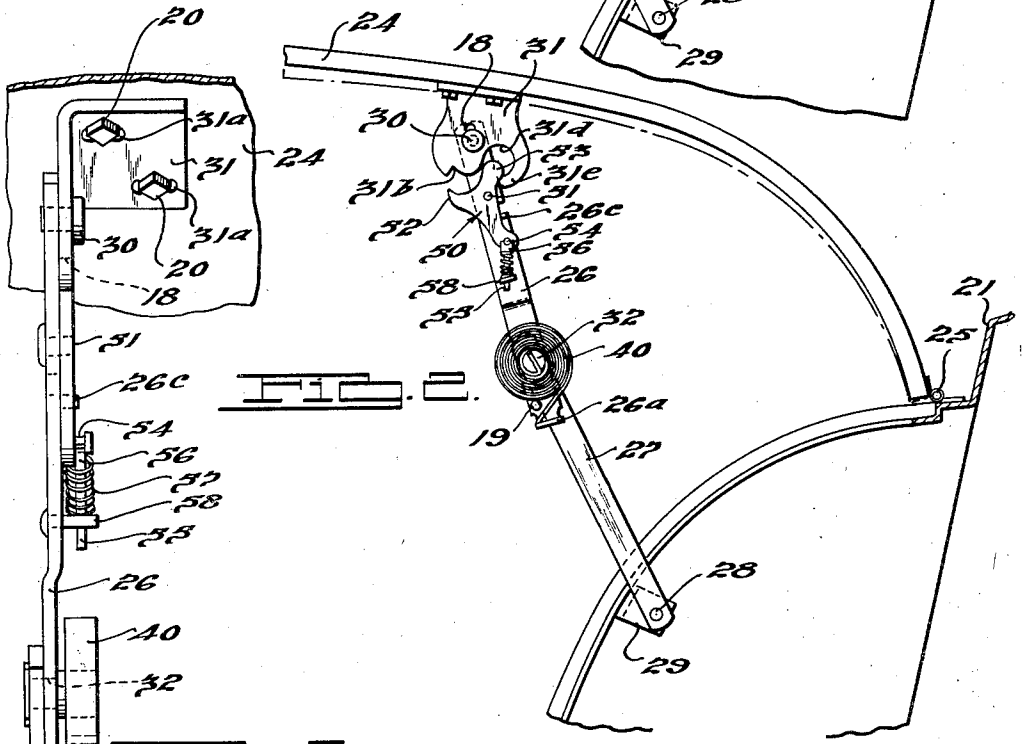


FIG. 2.

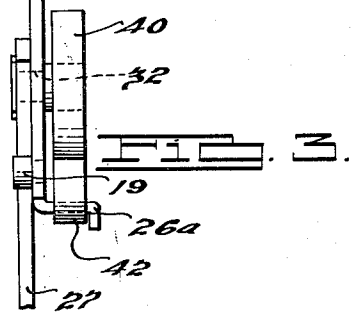


FIG. 3.

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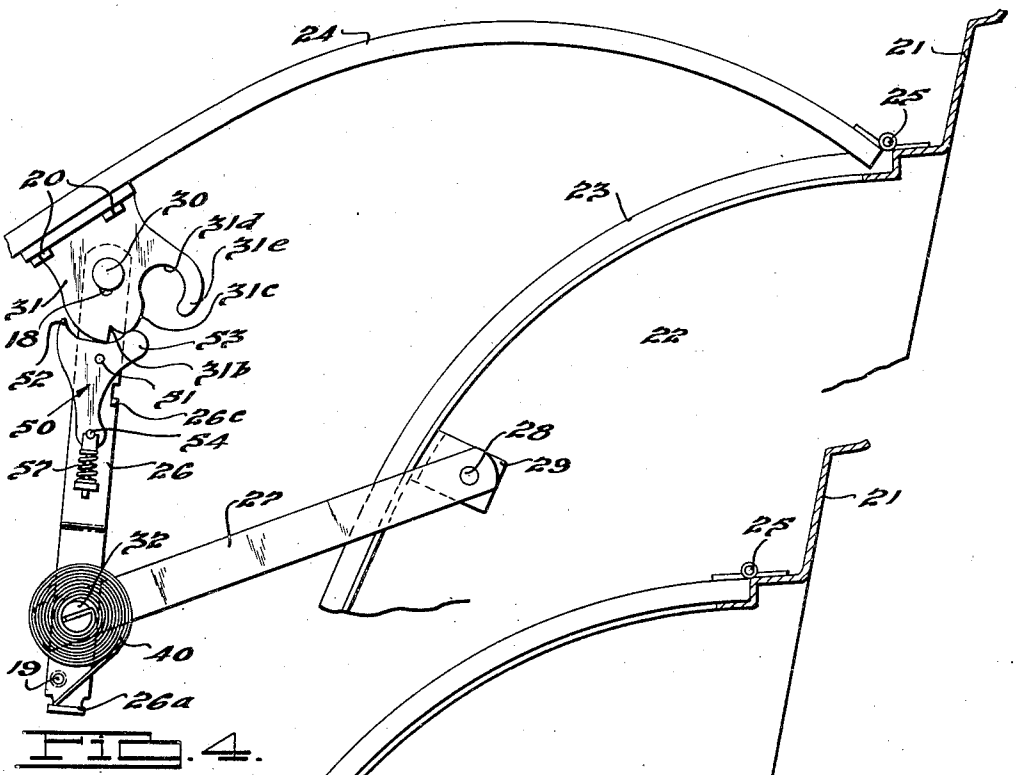


FIG. 4.

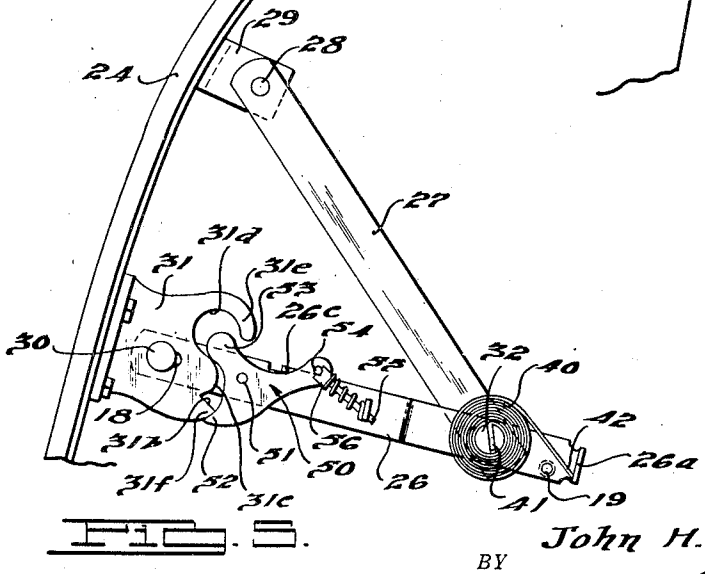


FIG. 5.

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CHECK ARM

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Application June 22, 1936, Serial No. 86,441

2 Claims. (Cl. 217—60)

This invention relates to supporting and locking arms, preferably of the toggle type, sometimes called check arms, particularly although not exclusively adapted for use on swinging deck or trunk lids for automobile or other vehicle bodies.

An object of the invention is to provide a check arm or device of the foregoing kind characterized by its simplicity and sturdiness of construction and wherein positive latching means of improved character is provided for maintaining the jointed parts of the arm in extended position when the lid is raised, the improved construction being such that the latch may be readily and easily released to lower the lid with complete safety to the operator so that the danger, as heretofore, of injury to the fingers or hand by being pinched between the folding parts of the arms is eliminated.

Another object of the invention is to provide a check arm which is operated and controlled solely by the movement of the deck or trunk lid to which it is attached, and in which the locking and/or releasing of the check arm is effected by said lid movement without the necessity of handling the check arm mechanism.

A further object of the invention is to provide a check arm of the foregoing character which automatically counterbalances the weight of the deck lid, not only assisting in raising the same but also resisting lowering thereof under the weight of the lid.

Other objects of the invention will appear from the following description and appended claims when considered in connection with the accompanying drawings forming a part of this specification.

Fig. 1 is a fragmentary elevation, partly in section, illustrating the check arm mechanism with the lid in open locked position.

Fig. 2 is a view similar to Fig. 1 showing the lid in elevated and unlocked position ready to be lowered into closed position.

Fig. 3 is a detail elevational view, on an enlarged scale, of the check arm mechanism, taken substantially along the line 3—3 of Fig. 1, looking in the direction of the arrows.

Fig. 4 is a view similar to Figs. 1 and 2, showing the lid in partially closed position.

Fig. 5 is a view of the parts shown in the preceding views with the lid in closed position.

Before explaining in detail the present invention 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, and it is not intended to limit the invention claimed herein beyond the requirements of the prior art.

In the drawings there is illustrated, merely by way of example, one embodiment of the present invention adapted for use in connection with the trunk lid of an automobile body. The body (not shown) includes a back panel 21 pressed outwardly and rearwardly to form a trunk compartment 22 having an opening 23 adapted to be closed by means of a trunk lid or cover 24 hinged at 25 to the back panel along the upper edge of the opening 23.

The lid 24 is preferably maintained in closed position by means of a conventional lock (not shown) and is adapted to be held in open elevated position by means of a check arm device or mechanism preferably attached to the left wall or end of the trunk compartment and to the lid adjacent its left edge. The check arm comprises preferably a pair of toggle links or bars 26 and 27. The lower bar 27 is pivoted at 28 to a stationary bracket 29 fixed to the body panel. The upper bar 26 is pivotally connected to a bracket 31, fixed to the inner face of the trunk lid 24, by means of a pin or rivet 30 secured to the bar and having a limited sliding connection in a slot 18 formed in the bracket 31. The inner end of the bar 27 is pivotally connected to the bar 26 at a point spaced from its inner end through the medium of a pivot pin or rivet 32 which is fixed to the bar 27 to move with said bar. The pin is journalled in the bar 26 to permit relative movement thereof. The inwardly projecting end of the pin 32 is provided with a transverse slot to receive the inner end 41 of a band spring 40, the opposite end 42 of the spring being secured to a portion 26a of the bar 26 which projects beyond the pivot 32. As shown, the spring is wound or coiled around the pivot pin 32 in a clockwise direction and with the parts in the positions in which they are shown in Fig. 5, with the deck lid closed, the spring is wound up or loaded. Thus, when the lid is moved upwardly toward open position, the spring 40 expands or unwinds and thus helps to counterbalance the weight of the lid and facilitate the raising thereof. As the lid is lowered, with the end 26a of the bar 26 moving outwardly away from the end of the bar 27 (see Fig. 4) the spring 40 is

again wound up and thus counterbalances the weight of the lid and by its resistance permits it to be lowered gradually into closed position.

The bracket 31 is provided with slots 31a which cooperate with bolts 29 so that the bracket may be adjusted upon the inner face of the lid 24 to permit the proper positioning of the check arm with respect to the trunk and its cover.

The inner or free end of the depending portion of the bracket 31 is provided with a notch 31b, a cam or convexly curved portion 31c, a concave portion or recess 31d and a curved finger 31e. The bracket 31 provides a keeper for a latch member 50 pivoted at 51 to the inner face of the bar 26. The latch member has at its outer end a pointed finger portion or pawl 52 and a rounded opposite end 53. The inner end of the latch member carries a pin or headed stud 54 which engages the notched outer end 56 of a spring projected locking plunger 55, the stem of which is surrounded by a spring 57. The upper end of the spring engages the under face of the head 56 and its lower end rests upon an apertured retainer 58 fixed to the bar 26. The spring plunger 55 is oscillatable in the retainer 58 and provides a snap-over spring device for positioning the latch 50 in operative or inoperative position.

The bar 26 is cut away at 26b and the metal thereof turned inwardly at an angle to the bar to provide a lug or stop 26c with which the pivoted latch 50 engages when in its position of Figs. 2 and 5. The bar 26 carries adjacent its inner end 26a a stop pin or stud 19 which engages the bar 27 (see particularly Fig. 3) to prevent the bars from moving to the right beyond their positions of Figs. 1 and 2. As seen in Fig. 1, when the lid is in elevated locked position the pointed portion or pawl 52 of the latch is in engagement with the notch 31b. In this position the inner end of the latch is positioned to the left, the spring pressed rod or plunger 55 serving to maintain the pointed end 52 in the notch 31b, thus locking the parts together and holding the lid positively in open position. In this position the rounded end portion 53 of the latch member is located within the recess 31d and the lower edge of the rounded portion 53 is in contact with the inner edge of the finger 31e.

When it is desired to lower the lid 24, the lid is grasped and elevated slightly above its position of Fig. 1 to its full line position of Fig. 2. This movement of the lid causes the finger 31e to engage the portion 53 of the latch and oscillate the latch about its pivot 51 so that its inner end is snapped over to the right of its dead center position, as shown in Fig. 2. In this position the pawl or finger 52 has been withdrawn from the locking notch 31b. The lid may now be freely lowered toward closed position, during which movement the cam surface 31c rides over the adjacent edge of the pivoted latch (see Fig. 4) with the bars swinging downwardly together and with the bar 26 moving toward the bar 27. This action winds up the band spring 40 placing it under tension. When the lid has been moved into fully closed position as shown in Fig. 5, the rounded end 53 of the latch is again located within the recess 31d and the pawl 52 engages the nose 31f. The inner end of the latch is now held toward the right of the bar 26. When it is desired to raise the deck lid the reverse action takes place, the cam portion 31c and the nose 31f riding over the adjacent edge of the latch 50 until the pawl 52 thereof engages in the notch 31b to lock the parts together in elevated position. During this operation, the latch is oscillated from the right of its dead center position to the left and is held in the latter position in the manner shown in Fig. 1.

From the foregoing it will be seen that I have provided a check arm device or mechanism for a trunk lid which operates automatically upon movement of the lid to lock the parts together with the parts in open position and to release the locked parts to permit the lid to be lowered, without the necessity of the operator touching the check arm mechanism. The counterbalancing spring interconnecting the ends of the pivoted links or bars of the check arm mechanism serves to lift a portion of the weight of the lid during its elevating movement and to counterbalance the weight of the lid as it is being lowered into closed position.

I claim:

1. A check arm for a swinging lid or the like comprising an upper bar and a lower bar, the lower bar having a fixed pivot pin at its inner end and the upper bar being swingably mounted upon said pivot at a point removed from its adjacent inner end, a bracket carried by said lid, the outer end of said upper bar being pivotally connected to said bracket and the outer end of said lower bar being adapted to be pivoted to a support, said bracket having a notch formed in an edge thereof, a spring pressed latch member carried by said upper bar and adapted to engage said notch to releasably lock the lid in raised position, and a counterbalancing spring connecting the adjacent ends of said upper and lower bars for counterbalancing the weight of the lid during its movements toward open and closed positions.

2. A check arm for a swinging lid or the like comprising an upper bar and a lower bar, the lower bar having a fixed pivot pin at its inner end and the upper bar being swingably mounted upon said pivot at a point removed from its adjacent inner end, a bracket carried by said lid, the outer end of said upper bar being pivotally connected to said bracket and the outer end of said lower bar being adapted to be pivoted to a support, said bracket having a notch formed in an edge thereof, a spring pressed latch member carried by said upper bar and adapted to engage said notch to releasably lock the lid in raised position, said bracket having a finger for engaging said spring pressed latch to release the same whereby to permit the lid to be lowered, and a counterbalancing spring connecting the adjacent ends of said upper and lower bars for counterbalancing the weight of the lid during its movements toward open and closed positions.

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