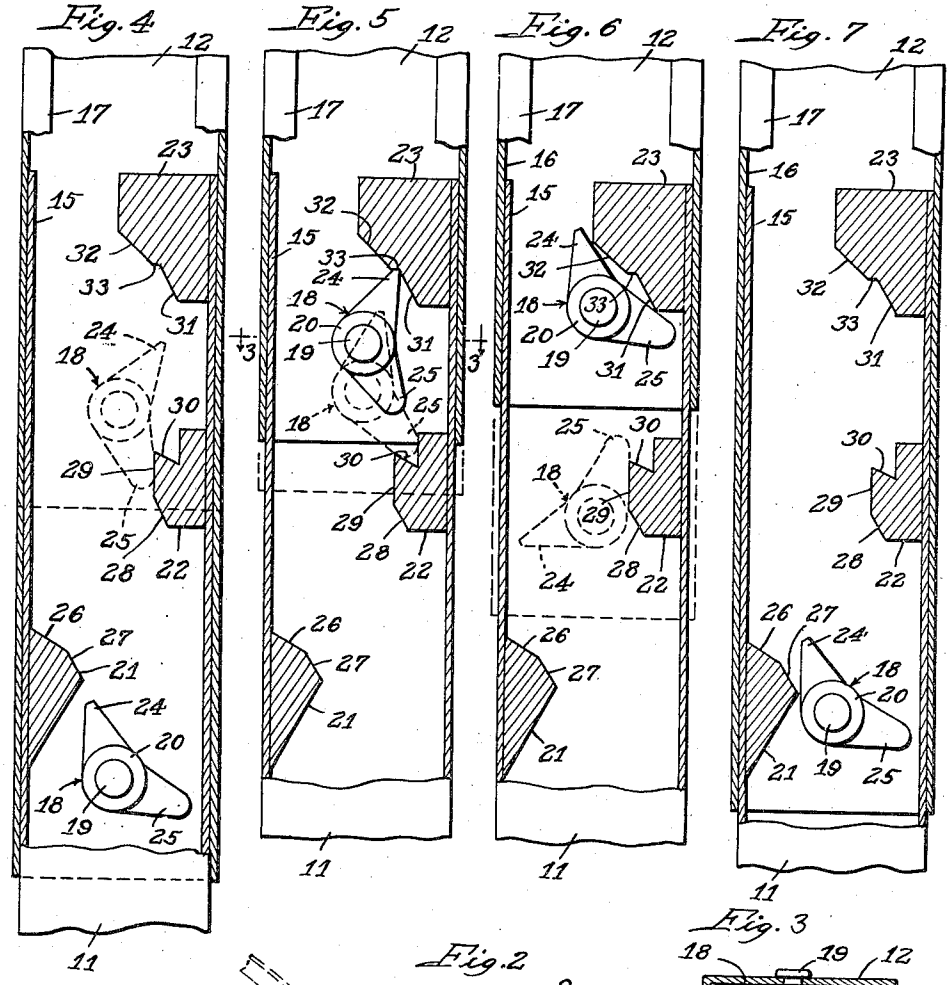
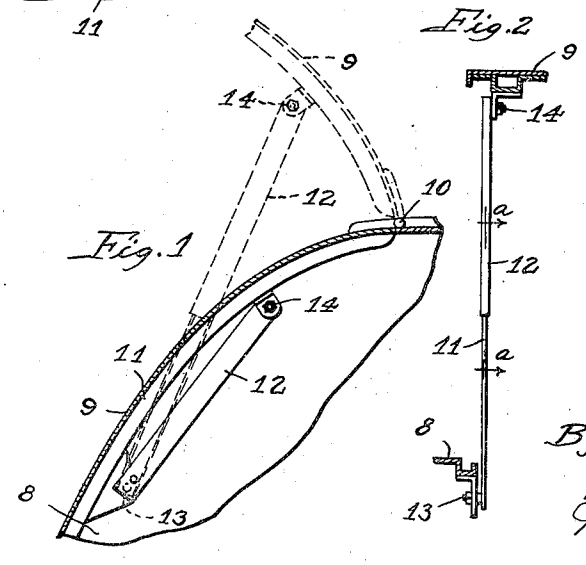
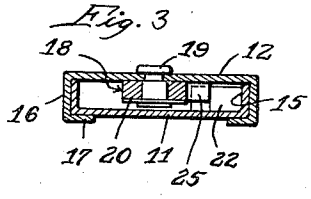
Jan. 21, 1941. W. R. LUSTIG 2,229,512

LID SUPPORT

Filed April 10, 1937







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Patented Jan. 21, 1941

2,229,512

UNITED STATES PATENT OFFICE

2,229,512

LID SUPPORT

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Application April 10, 1937, Serial No. 136,085

6 Claims. (Cl. 217—60)

This invention relates to lid supports, or more generally stated, supports for liftable hinged closures, and is herein specially concerned with a support suitable for use on the lids for rear trunks or luggage compartments on automobiles.

The lid supports now commonly used comprise two pivotally connected arms or links attached to the body and lid and arranged to unfold out of the luggage compartment in the opening of the lid. An objection to that type of support has been that there was danger of getting something pinched between the arms in folding, or of the arms poking into something in the luggage compartment and causing damage thereto in the closing of the lid. It is therefore the principal object of my invention to provide a support made up of two telescoping members slidable relative to one another in the opening and closing of the lid, whereby to avoid the dangers of damage or injury attributable to the "scissors" action of the other type of supports and the objections due to the "elbow" room required with that type.

Another object consists in the provision of simple but positively acting means for releasably locking the telescoping members in extended relation so that a predetermined endwise movement of the one member relative to the other produced by movement of the lid is sufficient to unlock the members for return movement to normal or retracted telescoped relation.

Other objects and advantages of the invention will soon appear in the following description wherein reference is made to the accompanying drawing, in which—

Figure 1 is a section through a portion of the luggage compartment on the rear of an automobile, showing a support made in accordance with my invention applied to the lid or door thereof, the mode of operation of the support being indicated by the dotted line showing of the lid in raised position;

Fig. 2 is a rear view of the support with the parts shown in the dotted line position of Fig. 1;

Fig. 3 is a cross-section through the support taken on the line 3—3 of Fig. 5, and

Figs. 4 to 7 are sections in the plane of the line *a—a* of Fig. 2, showing the telescoping support members in the different positions throughout a cycle starting with the raising of the lid and ending with the lowering thereof, Fig. 4 of this series showing in full lines the members in the full line position of Fig. 1, and Fig. 5 of this series showing in its dotted line position the members in the dotted line position of Fig. 1.

The same reference numerals are applied to corresponding parts throughout the views.

Referring first to Figs. 1 and 2, the numeral 8 designates the rear trunk or luggage compartment on an automobile, and 9 its door or lid hinged at 10 to permit raising and lowering the same, as indicated in the full and dotted line positions. 11 and 12 are two supporting arms or links pivotally attached at 13 and 14, respectively, to the side wall of the trunk 8 and edge portion of the lid 9, as shown. The arms 11 and 12, in accordance with my invention, are in slidable telescoping relation, and in the closed position of the lid are telescoped on one another substantially their full length, as shown in full lines in Fig. 1, taking up a minimum amount of room inside the trunk, much less room than was required with the other style of folding supports. The arm 12 slides on the arm 11 when the lid 9 is raised, and the arms are arranged to be locked releasably in the extended relationship by the novel means hereinafter described, whereby to support the lid in raised position, as indicated in dotted lines in Fig. 1 and as illustrated in Fig. 2. The fact that the arms slide on one another in a telescoping fashion eliminates any danger of something getting caught between the parts in the closing of the lid. In other words, this type of support, besides requiring less "elbow" room in the trunk in the closing of the lid, and hence avoiding likelihood of the support doing damage to something placed in the trunk, presents no danger of damage or injury like the other style of supports where the arms folded in "scissors" fashion and might therefore pinch something that happened to get caught between the arms in the closing of the lid.

The arm 11, as clearly appears in Fig. 3, is formed from sheet metal to channel-shaped cross-section, and the same is true of the arm 12, but the arm 11 simply has its longitudinal flanges 15 bent at right angles thereto and slidable between the flanges 16 of the arm 12, the arms being in opposed relation, as shown, so that the bottoms or webs of the channels are in spaced relation. The marginal edge portions of the flanges 16 are bent inwardly behind the arm 11 to hold the arms in telescoping relation. A pawl 18 is pivotally mounted on the arm 12 near the lower end thereof on a stud 19 with a spring washer 20 acting between the pawl and an annular shoulder on the stud to exert enough frictional drag on the turning of the pawl to insure keeping the pawl in a given position until it is forcibly moved by cam action to another posi-

tion. There are three cam blocks 21, 22, and 23 suitably secured to the arm 11 in longitudinally spaced relation at the upper end thereof, the block 21 being on one side of a longitudinal center-line passing through the stud 21 and the blocks 22 and 23 being on the other side of said center-line. The pawl 18 has two teeth 24 and 25 in approximately right angle relationship. The block 21 has two angularly related cam surfaces 26 and 27 on the top thereof to cooperate with the tooth 24 of the pawl 18 in its downward movement from the dotted line position of Fig. 6 to the position shown in Fig. 7 to turn the pawl through 90° in a clockwise direction and thus reset the pawl to the starting position for the cycle. The block 22 has two angularly related surfaces 28 and 29 below the ledge 30 on the upper outer corner of the block. The tooth 25 of the pawl engages the surface 28 in the upward travel of the pawl from the full line position of Fig. 4 to the dotted line position, and turns the pawl in a clockwise direction through about 45° so as to bring the tooth 24 into a position where it will properly cooperate with the cam 23 for the camming of the pawl into position to seat on the ledge 30 by means of its tooth 25. The block 23 has two cam surfaces 31 and 32 below and above the shoulder 33, and the pawl 18 when indexed to the dotted line position of Fig. 4 has its tooth 24 properly disposed to ride on the surface 31 in the upward movement of the pawl. The pawl is thereby turned slightly in a counter-clockwise direction, as illustrated in full lines in Fig. 5, thereby shifting the tooth 25 into position over the ledge 30. The upward movement of the pawl 18 is limited by engagement of the tooth 24 with the shoulder 33, as shown in Fig. 5, so that the operator has a definite way of telling when he has raised the lid far enough to lock it in raised position. He then simply lowers the lid until the tooth 25 engages the ledge 30, as indicated in dotted lines in Fig. 5. In this position, the arm 12, being prevented from downward movement, supports the lid 9 in raised position. When the tooth 25 strikes the ledge 30, there is a further jog of the pawl 18 in a counter-clockwise direction as the tooth rides in as far as it will go, as must be apparent from comparison of the dotted line position of the pawl with the full line position in Fig. 5. The tooth 24 is thereby shifted to the left and out of line with the shoulder 33 where it was formerly seated, and accordingly when the lid is to be unlocked and lowered to closed position, it is only necessary to raise the lid as far as it will go, and in this movement the tooth 24 of the pawl will ride along the surface 32 and turn the pawl 18 still further in a counter-clockwise direction until the pawl 18 comes into abutment with the block 23 broadside, as shown in full lines in Fig. 6. This again is a means of definitely informing the operator that he can now lower the lid to closed position, having reset the pawl 18 properly. As the lid is lowered, the tooth 25 encounters the top of the cam block 22 in the downward movement of the pawl 18 from the full line position in Fig. 6, causing the pawl 18 to be turned in a counter-clockwise direction through approximately 90°, as indicated in dotted lines in Fig. 6. Shortly thereafter, the tooth 24 of the pawl 18, as previously described, strikes the top of the cam 21, and by riding over the surfaces 26 and 27 causes the pawl 18 to be turned through approximately 90° in a clockwise direction to the position shown in Figs. 7 and 4.

The operation of the device is believed to be clear from the foregoing description. When the lid is closed, the pawl 18 is, of course, in remote relation to the cams 21—23, inasmuch as the pawl is on the lower end of the arm 12 while the cams are on the upper end of the arm 11. As the lid is raised, the pawl 18 approaches the cams and passes the cam 21 by which it was last reset, as above described. The pawl in the further upward movement of the lid is turned to the dotted line position in Fig. 4 by the cam 22, and finally the upward movement of the lid is stopped when the pawl tooth 24 strikes the shoulder 33 on the cam 23, as shown in full lines in Fig. 5. The operator then simply lowers the lid and the pawl 18 seats with its tooth 25 engaging the ledge 30 on the cam 22, as in dotted lines in Fig. 5. The lid is very securely supported, because even though one were to brush against the open lid while putting something into the trunk or removing something therefrom, it is obvious that such slight movement would not cause any shifting of the pawl 18, but the pawl would simply be lifted off the ledge 30 and allowed to reseat. For a similar reason, such slight movement as the lid might happen to be given by wind pressure would not result in accidental dropping of the lid to closed position. It is only when the operator forceably lifts the lid as far as it will go so as to reset the pawl 18 from the dotted line position of Fig. 5 to the full line position of Fig. 6, that the lid can be closed. The lid in closing causes the pawl 18 to be shifted first from the full line position in Fig. 6 to the dotted line position by the cam 22 and then to the position shown in Fig. 7 by engagement with the cam 21. This leaves the parts in position for the next cycle.

It is obvious that there is nothing in this support that is apt to break or get out of order. The pawl 18 has such a small amount of movement that the spring washer 20 is not apt to cause enough wear to affect the positive operation of the support. Furthermore, there is nothing on the support apt to rattle when the lid is closed and the car is in motion, because the only moving part is kept under constant spring pressure.

It is believed the foregoing description conveys a good understanding of the objects and advantages of my invention. The appended claims have been drawn with a view to covering all legitimate modifications and adaptations.

I claim:

1. A device of the character described comprising an arm pivotally attached to a lid or other hinged member, another arm in telescoping relation with the first arm and pivotally attached to a receptacle or other support on which the lid is hinged, a pawl pivotally mounted on one of said arms having two teeth which extend radially from the pivot in transverse relation to one another, and three cams in longitudinally spaced relation on the other of said arms arranged to engage the teeth of the pawl and constituting the sole means to shift the same pivotally from one position to another in the endwise movement of one arm relative to the other, the pawl and two of the cams cooperating so that they limit endwise movement of one arm relative to the other toward coextensive telescoping relation and releasably lock said arms in coextensive telescoping relation whereby to support the lid in open position, the third cam being arranged to be engaged by the pawl in the return movement of the arms from extended relationship to reset the pawl for the beginning of the next cycle of operation.

2. A device of the character described comprising an arm pivotally attached to a lid or other hinged member, another arm in telescoping relation with the first arm and pivotally attached to a receptacle or other support on which the lid is hinged, a pawl pivotally mounted on one of said arms having two teeth in substantially right-angle relation, and three cams in longitudinally spaced relation on the other of said arms for engagement with the teeth of the pawl in the endwise movement of the arms relative to one another, two of said cams being on one side of a longitudinal center line through the pawl pivot, namely, a stop cam for limiting endwise movement of one arm relative to the other toward coextensive telescoping relation by engagement with the pawl, and a supporting cam for releasably locking the arms in coextensive telescoping relation to support the lid in open position by engagement with the pawl, and the other cam being on the other side of the longitudinal center line and being a reset cam which in the return movement of the arms from extended relation engages and resets the pawl.

3. A device of the character described comprising an arm pivotally attached to a lid or other hinged member, another arm in telescoping relation with the first arm and pivotally attached to a receptacle or other support on which the lid is hinged, a pawl pivotally mounted on one of said arms having two teeth in substantially right-angle relation, means for yieldingly resisting turning of said pawl, whereby to retain the same releasably in any position of adjustment until it is forcibly moved to another position, and three cams in longitudinally spaced relation on the other of said arms for engagement with the teeth of the pawl in the endwise movement of the arms relative to one another, two of said cams being on one side of a longitudinal center line through the pawl pivot, namely, a stop cam for limiting endwise movement of one arm relative to the other toward coextensive telescoping relation by engagement with the pawl, and a supporting cam for releasably locking the arms in coextensive telescoping relation to support the lid in open position by engagement with the pawl, and the other cam being on the other side of the longitudinal center line and being a reset cam which in the return movement of the arms from extended relation engages and resets the pawl.

4. A device of the character described as set forth in claim 3, wherein said arms are of channel-shaped cross-section with the longitudinal flanges of one arm slidable between the longitudinal flanges of the other arm and projecting toward the connecting web thereof, there being means holding said arms in this telescoping relation, and said pawl and cams being mounted between said arms with the pawl on the web of one arm and the cams on the web of the other arm in operative relationship.

5. A device of the character described comprising an arm pivotally attached to a lid or other hinged member, another arm in telescoping relation with the first arm and pivotally attached to a receptacle or other support on which the lid is hinged, a pawl pivotally mounted on one of said arms having two teeth in transverse relationship extending substantially radially from the pivot, two spaced projections on the other arm, one of which is arranged to engage one tooth of the pawl to bring the other tooth of the pawl into position to engage the other projection, whereby to limit endwise movement of one arm relative to the other toward coextensive telescoping relation, the first named projection being thereafter arranged to engage the first named tooth to limit return movement of the first arm relative to the other arm so as to releasably lock the arms in coextensive telescoping relation and support the lid in open position, and another projection on the same arm with the aforesaid spaced projections and spaced therefrom and arranged to engage the pawl upon endwise movement of the arms relative to one another to return the pawl to a starting position with relation to the aforesaid projections.

6. A device of the character described comprising an arm pivotally attached to a lid or other hinged member, another arm in telescoping relation with the first arm and pivotally attached to a receptacle or other support on which the lid is hinged, a pawl pivotally mounted on one of said arms having two teeth in transverse relationship extending substantially radially from the pivot, two spaced projections on the other arm, one of which is arranged to engage one tooth of the pawl to bring the other tooth of the pawl into position to engage the other projection, whereby to limit endwise movement of one arm relative to the other toward coextensive telescoping relation, the first named projection being thereafter arranged to engage the first named tooth to limit return movement of the first arm relative to the other arm so as to releasably lock the arms in coextensive telescoping relation and support the lid in open position, another projection on the same arm with the aforesaid spaced projections and spaced therefrom and arranged to engage the pawl upon endwise movement of the arms relative to one another to return the pawl to a starting position with relation to the aforesaid projections, and means for yieldingly resisting turning of the pawl, whereby to retain it releasably in any position until it is forcibly moved to another position.

WALTER R. LUSTIG.