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(54) IMPROVEMENTS RELATING TO HINGED LID ASSEMBLIES FOR MOTOR VEHICLES

(71) We, LANCIA & C. FABBRICA AUTOMOBILI TORINO S.p.A., an Italian company, of Via Vincenzo Lancia 27, Turin, Italy, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to the hinged attachment, to a motor vehicle, of the lid of the engine or luggage compartment of the motor vehicle.

More particularly, the invention concerns hinge assemblies of the type comprising spaced apart support arms, each of which is hinged at one end to the body of the vehicle and is provided at its opposite end with means which supports the lid, and resilient means acting on at least one of the arms to facilitate opening of the lid and to maintain the lid in its open position.

Normally the lid of a vehicle engine or luggage compartment is rigidly fixed to the corresponding ends of the support arms. The trajectory and the position of the lid upon opening is therefore determined solely by the conformation of the support arms and by the way in which they move relative to the body of the motor vehicle. This constitutes a limitation which can be inconvenient, for example in restricting access to the engine or luggage compartment.

With the aim of avoiding this invenience, according to the present invention the lid of the engine or luggage compartment of a motor vehicle is attached to the body of the vehicle by a hingle assembly comprising two spaced apart support arms, each of which is articulated at one end to the lid so that the lid can be pivoted relative to the support arms about a horizontal axis, means for limiting the rotation of the lid relative to the support arms at two extreme positions in each of which the lid is restrained, and resilient means acting on at least one of the support arms to facilitate the pivoting of the support arms relative to the vehicle body when the lid is opened, the restraint on the lid in its extreme position of rotation relative to the support arms in the same direction as that in which the lid is rotated when it is opened being applied by at least one spring acting on the lid and on at least one of the support arms.

The arrangement in accordance with the invention, by allowing further rotation of the lid relative to the support arms, allows an increase of the opening angle of the lid compared with that obtainable with a similar lid hinged in a traditional manner, thereby improving the access to the engine or luggage compartment.

An example of a motor vehicle in accordance with the invention will now be described with reference to the accompanying drawings, in which:—

Figure 1 is a schematic perspective view illustrating the rear part of a vehicle provided with a boot lid hinged to the body of the vehicle in accordance with the invention;

Figure 2 is a view similar to Figure 1 but on an enlarged scale to show more details of the hinge assembly; and,

Figure 3 is a perspective view of parts of the hinged assembly in isolation.

In the drawings reference numeral 1 indicates a rear door, or lid, for closing a boot 1*a* or luggage compartment of a vehicle. The door 1 is supported by the fixed structure of the vehicle through two spaced apart C-shaped support arms 2. Each of the arms 2 is articulated at one end 2*b* to the structure of the vehicle by means of a hinge pin 3 carried by a plate 3*a* attached to the structure of the vehicle. Each support arm 2 isarticulated at its opposite end, by means of a hinge pin 5, to an apertured lug provided on a plate 6 supporting the door 1.

The two support arms 2, and the hinge pins 5 and support plates 6 associated therewith, are symmetrically disposed with respect to the longitudinal vertical plane of symmetry of the vehicle. The hinge pins 5

are therefore located on a common horizontal axis extending perpendicularly to the longitudinal axis of the vehicle. Consequently the door 1 is supported for rotation about the axis of the hinge pins 5 by the two support arms 2. At the end 2*b* each support arm 2 engages one end of a helical ring 4 which is attached at its opposite end to the fixed structure of the vehicle. The action of the spring 4 is such as to facilitate the opening manoeuvre of the door 1 and to maintain the door 1 in an open position. The rotation of the door 1 around the hinge pins 5 is limited in both directions by engagement of the door itself with the support arms 2, as is apparent from Figure 2.

Within the panel of the door 1 there is housed a torsion spring 9 comprising two straight portions 9*a* interconnected by an intermediate U-shaped portion 9*b*. Each of said straight portions 9*a* has at its free end an end portion 9*c* which is substantially perpendicular to the portion 9*a*. The length of the spring 9 is such that the end portions 9*c* are arranged, in the mounted condition of the spring 9, facing the support arms 2. Each of the end portions 9*c* bears against a respective pin 10 carried by the corresponding support arm 2. The intermediate U-shaped portion 9*b* of the spring 9 bears against the inside surface of the door 1. The torsion in the spring 9 counteracts the weight of the door 1, assisting the opening of the latter. The stiffness of the spring 9 is moreover such that the force exerted by it is able to keep the door 1 in its extreme position of rotation in the opening direction about the hinge pins 5, but is unable, in the opposite extreme position of rotation of the door, to overcome the effect at the hinge pins of the weight of the door itself.

The operation of the hinge device described herein is as follows. Starting with the door 1 closed, the first stage in the opening of the door is a lifting of the door under the influence of the springs 4 to the position of maximum upward rotation of the support arms 2. During this phase the door 1 is kept in the lowered position relative to the support arms under the influence of its own weight, the moment of which about the axis of the hinge pins 5 overcomes the couple exerted in the opposite direction by the spring 9. In a second door opening stage the operator, if he wishes to open the door 1 further, lifts the latter, assisted by the torsion spring 9, so as to overcome the weight of the door. In this way an upward rotation of the door 1 takes place relative to the support arms 2, until the door 1 reaches the position of maximum opening. In this extreme position the couple exerted by the spring 9 overcomes the opposite couple exerted by the weight of the door 1 itself, so that the door 1 is maintained by the spring 9 in its fully lifted position. When closing the door 1 the above described sequence of operations is reversed.

WHAT WE CLAIM IS:—

1. A motor vehicle having an engine or luggage compartment with a lid which is attached to the body of the vehicle by a hinge assembly comprising two spaced apart support arms, each of which is articulated at one end to the vehicle body and is pivotally attached at its other end to the lid so that the lid can be pivoted relative to the support arms about a horizontal axis, means for limiting the rotation of the lid relative to the support arms at two extreme positions in each of which the lid is restrained, and resilient means acting on at least one of the support arms to facilitate the pivoting of the support arms relative to the vehicle body when the lid is opened, the restraint on the lid in its extreme position of rotation relative to the support arms in the same direction as that in which the lid is rotated when it is opened being applied by at least one spring acting on the lid and on at least one of the support arms.

2. A vehicle according to claim 1, in which the spring is a torsion spring supported by the lid and extending transversely between the two support arms, the spring having straight portions interconnected by an intermediate U-shaped portion, and two end portions, the intermediate U-shaped portion reacting against the lid, and the two end portions reacting one against each support arm.

3. A vehicle according to claim 1 or claim 2, in which the restraint on the lid in its other extreme position of rotation relative to the support arms is effected by the weight of the lid, and the lid is restrained in this extreme position of rotation during an initial stage of the lid opening due to the rotation of the support arms relative to the vehicle body.

4. A vehicle according to any one of the preceding claims, in which the attachment of the lid to the support arms is effected by two plates each of which is fixed to the lid in a position facing a support arm and is provided with an apertured lug to which the facing support arm is pivotally connected by means of a hinge pin.

5. A vehicle according to claim 1, substantially as described with reference to and as shown in the accompanying drawings.

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2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 1

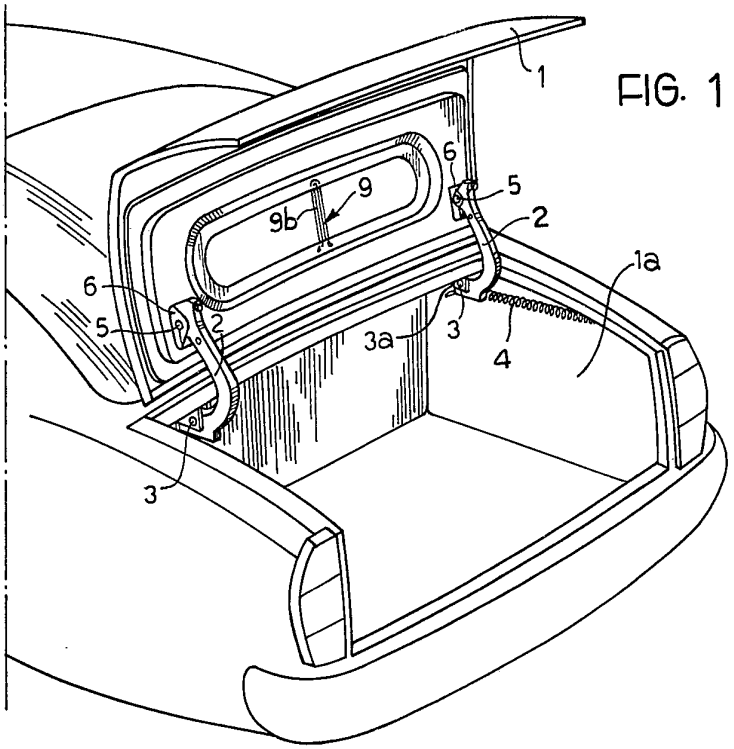
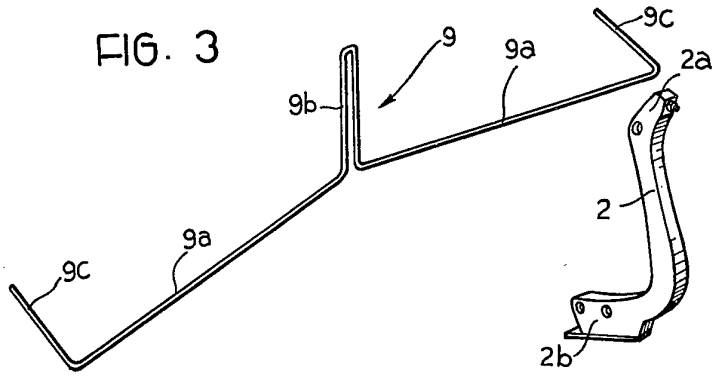


FIG. 1

FIG. 3



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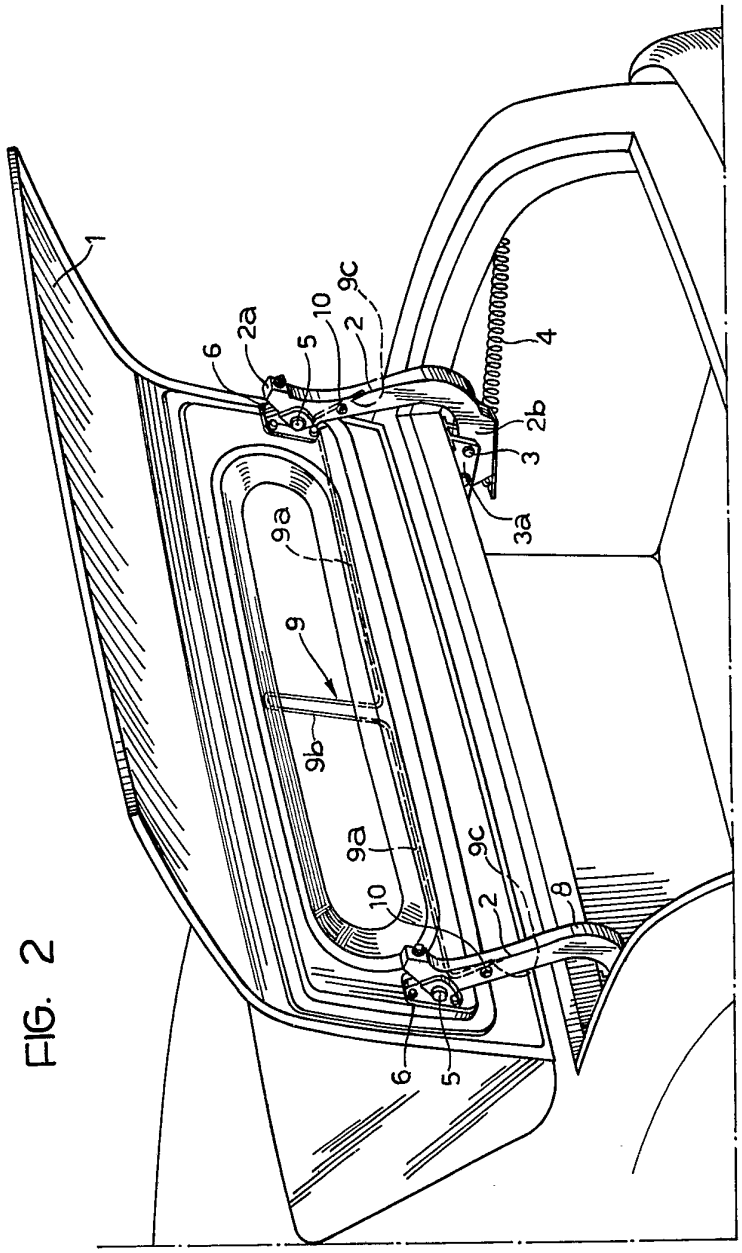

FIG. 2