May 5, 1964 P. WERNER 3,131,959

LOCK ESPECIALLY FOR DOORS IN MOTOR VEHICLES

Filed Aug. 15, 1961

FIG. 1

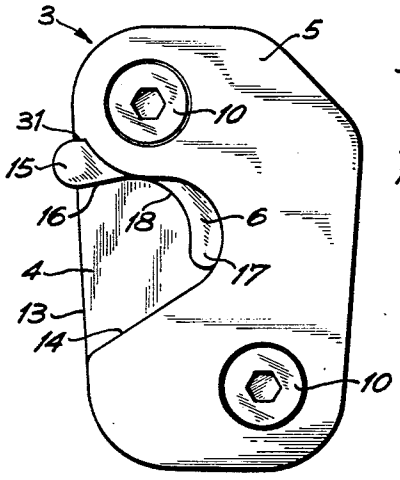


FIG. 2

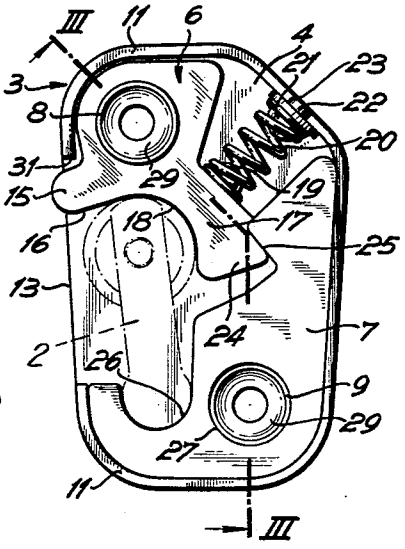
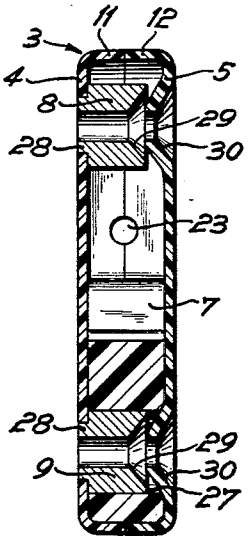


FIG. 3



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LOCK ESPECIALLY FOR DOORS IN MOTOR VEHICLES

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This invention relates to locks, and more specifically to a lock for doors in motor vehicles, with a latch bolt pivotally mounted at one end on the door of a motor vehicle and adapted to cooperate with a latch keeper assembly mounted on the jamb lining of the door frame or the doorpost of the vehicle in such a manner that the opposite, free end of the latch bolt can be received in a recess of a bolt receiving member of the latch keeper assembly and that the pivoted end of the latch bolt engages a surface subjected to pressure and formed by a hingedly mounted spring-biased member of the latch keeper assembly.

In a known arrangement of this kind the hingedly mounted member is of wedge-shaped configuration, whereas the pivotally mounted latch bolt is bifurcated at its free end so that the two are locked when the latter is swung into the former by pushing the bifurcated end of the latch bolt over a stationary stud. This known arrangement does not ensure a safe final position of the latch bolt and a chattering of the door cannot be avoided even if close tolerances are observed and especially the cotter cannot absorb any shocks or vibrations to which a lock in a vehicle is naturally subjected.

It is the object of the present invention to ensure a safe final position of the pivotally mounted latch bolt in the latch keeper assembly.

This object is substantially achieved according to the present invention in a simple manner by providing a lock which comprises a latch keeper assembly adapted to be mounted on the doorpost of a motor vehicle for cooperation with a latch bolt pivotally mounted at one end on the door of the motor vehicle, said latch keeper assembly consisting of a housing composed of a base plate and a cover plate arranged in substantially parallel spaced relation to one another, a member hingedly mounted in the housing and having an inner leg with a curved surface and an outwardly projecting leg having a curved surface, a coil spring acting upon the inner leg of the hingedly mounted member on the side remote from the latch bolt, and a bolt receiving member having a recess adapted to receive the free end of the latch bolt, the curved surfaces forming a continuous guide surface engaging around said pivoted end of said latch bolt.

In this manner an initial and final locking position is produced which is conveniently obtained by the fact that the hingedly mounted member of the latch keeper assembly is constructed with two legs. The outwardly projecting leg engages behind the pivoted end of the latch bolt already when the latter is in an intermediate position and the inner leg comes to rest against a stationary abutment in the final position of the latch bolt. This arrangement is chatter-free even without observing close tolerances and it is also adapted to absorb major shocks. According to another feature of the invention this effect is increased by making the abutment of elastic material, especially of a rubber-like pressed material or synthetic plastic material, so that it requires no mechanical treatment just as the hingedly mounted member of the latch keeper assembly which also substantially consists of synthetic plastic material.

According to another feature of the invention the abutment for the closed position of the hingedly mounted

member of the latch keeper assembly and the recess for receiving the free end of the pivotally mounted latch bolt are made of the same elastic material. They are preferably formed integral with the bolt receiving member which is stationarily arranged in the housing of the latch keeper assembly. The latch keeper assembly can be supplied ready for fitting since the housing protects the inner elements and enables at the same time a reliable and easy mounting.

The base plate may be provided with two bushes through which the fastening screws can be passed. One of the bushes, moreover, may serve as a bearing for the hingedly mounted member of the latch keeper assembly.

Preferably bent-over end walls may be provided on the base plate and the cover plate to close the housing on all sides and hold and guide the hingedly mounted member, the bolt receiving member and the coil spring in the housing. The housing is then provided with corresponding recesses to allow for the entry thereinto of the pivotally mounted latch bolt. One edge of a recess in the end walls can serve as abutment for the outwardly projecting leg of the hingedly mounted member of the latch keeper assembly in the open position thereof. In this manner a uniform compact shape of the latch keeper assembly is obtained.

The stationary bolt receiving member of the latch keeper assembly is expediently made of a different material than the hingedly mounted member. The hingedly mounted member may, for instance, be produced in a known manner of a polyamide by the die-casting process without forming blisters, and the stationary bolt receiving member may consist of "Vulkolan" or another rubber-like synthetic plastic or pressed material.

The coil spring acting upon the hingedly mounted member expediently engages the inner leg thereof which defines the final locking position for the pivoted end of the pivotally mounted latch bolt. This arrangement ensures a compact construction and, at the same time, permits the individual elements, especially the inner leg, to be given maximum dimensions and ensures a securing at two points.

A preferred embodiment of the invention will now be described by way of example and with reference to the accompanying drawing, in which:

FIG. 1 is a top plan view of a latch keeper assembly shown as enclosed in a housing and in the open position;

FIG. 2 is a similar view of the latch keeper assembly shown in the closed position and with removed cover plate, and

FIG. 3 is a section through the latch keeper assembly taken on line III—III of FIG. 2 with removed movable elements.

A construction of a latch bolt known per se has been chosen as an example, which in a manner likewise known per se, is attached to the door of a motor vehicle so that hereinafter only the details necessary for a good understanding of the invention will be described.

With reference now to FIGS. 1 and 2, a latch bolt 2, shown by dot and dash lines, is pivotally mounted at one end on the outer side of one of the lock plates of the door of the motor vehicle. In the closed position shown in FIG. 2 the latch bolt 2 engages in a latch keeper assembly 3 which consists of a hingedly mounted member 6 and a bolt receiving member 7, both being accommodated in a housing formed by a base plate 4 and a cover plate 5 arranged in substantially parallel spaced relation to one another. Two steel bushes 8 and 9 are provided on the base plate 4. Countersunk screws 10 can be passed through these bushes to secure the latch keeper assembly 3 to the wall of the motor vehicle.

The base plate 4 and the cover plate 5 are provided at

their edges with bent-over end walls 11 and 12 which each have a recess 13 for the passage therethrough of the latch bolt 2. The cover plate 5 is moreover provided with a recess 14 corresponding in shape to the shape of the pivotally mounted latch bolt 2.

The member 6 is hingedly mounted on the bush 8 and has a leg 15 outwardly projecting through the recess 13. A curved guide surface 16 is formed on the leg 15 and serves as an abutment in the initial locking position of the latch bolt 2. The recess 13 has an edge 31 serving as an abutment for the outwardly projecting leg 15 in the open position of the lock as shown in FIG. 1. An inner leg 17 of the hingedly mounted member 6 has a curved guide surface 18 which is of circular configuration conforming to the pivoted end of the latch bolt 2 and serves as an abutment in the final locking position. The inner leg 17 is provided on its side remote from the surface 18 with a spherical bearing 19 for the reception thereon of one end of a coil spring 20 supported at the other end on the bent-over end walls 11 and 12 in a bearing bracket 21. The bearing bracket 21 is provided with an extension 22 received in two semi-circular openings 23 of the bent-over end walls 11 and 12. The inner leg 17 bears with its end 24 against an abutment 25 formed by the bolt receiving member 7. The bolt receiving member 7 is provided with a recess 26 for receiving the free end of the latch bolt 2 and an opening 27 for the bush 9. The bolt receiving member 7 rests against the base plate 4 and is, moreover, held in position by the bush 9.

The bushes 8 and 9 are each secured to the base plate 4 by means of a pin 28 and have a recess 29 provided in their free end faces. The cover plate 5 engages in the recess 29 with a depression 30 which accommodates the head of the countersunk mounting screw 10 expediently constructed with an inner hexagonal screw hole.

In the closed position shown in FIG. 2 the inner leg 17 engages with its end 24 the abutment 25 thereby ensuring a safe final position of the latch bolt 2. The latch keeper assembly may consist of pressed material, especially synthetic plastic material, which imparts a certain elasticity to the final position and requires no mechanical treatment.

When the lock is being opened, the pivoted end of the pivotally mounted latch bolt 2 moves forwardly along the curved surface 18 of the inner leg 17 subjected to pressure and the curved surface 16 of the outwardly projecting leg 15 while the free end of the latch bolt 2 is being disengaged from the bolt receiving recess 26. The inner leg 17 is forced away from the abutment 25 through the intermediary of the coil spring 20 and turned until the outwardly projecting leg 15 engages the edge 31 of the recess 13 as shown in FIG. 1. In this position the latch keeper assembly is open again.

When the lock is being closed, i.e. the latch bolt 2 turns inwardly, its pivoted end is brought into engagement with the curved guide surface 16 and its free end is received in the bolt receiving recess 26. The latch bolt 2 thereby reaches with its pivoted end an intermediate position located between the opened and closed positions in which the outwardly projecting leg 15 with its curved guide surface 16 is snapped into engagement behind the pivoted end of the latch bolt 2 before the latter urges, with its pivoted end, the inner leg 17 against the coil spring 20 and the inner leg 17 reaches with its surface 18 its final position. The intermediate locking position together with the final position ensures a reliable operation of the latch keeper assembly even if the latch bolt 2 is not completely swung into the latch keeper assembly and when the door is slammed. The pressed inner elements are substantially enclosed by the housing and supported therein. Especially the elastic bolt receiving member 7 is supported on its entire outer surface.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

The outer and inner surfaces of the housing and the inner members may also have different shapes and be secured in a different manner. As has already been mentioned, the bolt receiving recess 26 and the abutment 25 may also consist of separate parts especially when a different degree of elasticity is required therefor.

I claim:

1. In a lock, a lock keeper assembly, in combination with a latch bolt having a curved pivoted end and a free end, said lock keeper assembly comprising a support; a member having an outer leg and an inner leg, said legs having each a bottom face blending into each other to form intermediate the free ends of said bottom faces a concavely curved abutment surface corresponding in curvature substantially to that of the pivoted end of said latch bolt, said member being pivotally mounted on said support for pivotal movement between a lead-in position in which the bottom face of said outer leg forms a lead-in surface and a turned locking position in which said concavely curved abutment surface partly encompasses the curved pivoted end of the latch bolt; spring means engaging said member and tending to keep the same in said lead-in position, said member being turned from said lead-in to said locking position by engagement of said bottom face of said inner leg by the latch bolt; and receiving means on said support for receiving the free end of the latch bolt.

2. A lock as claimed in claim 1 in which said receiving means is formed with an abutment cooperating with said inner leg for limiting turning movement of said member from said lead-in to said locking position.

3. A lock as claimed in claim 2, wherein the abutment consists of elastic material.

4. A lock as claimed in claim 2, wherein the abutment is formed integral with the bolt receiving means.

5. A lock as claimed in claim 1 in which said support is in form of a housing enclosing said member, said spring means and said receiving means.

6. A lock as claimed in claim 5 and including an abutment formed by said housing and cooperating with said member for limiting turning movement thereof from said locking to said lead-in position.

7. A lock as claimed in claim 5, wherein recesses are provided in the housing for the entry thereinto of the pivotally mounted latch bolt.

8. A lock as claimed in claim 5, wherein said housing includes a base plate; and a pair of bushings mounted on said base plate.

9. A lock as claimed in claim 8, wherein said bushings serve for holding the latch keeper assembly in place and one of the bushings forms a bearing for said pivotally mounted member.

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