Jan. 16, 1940. R. W. BUTLER 2,187,531

COMBINED LATCH AND DOVETAIL STRUCTURE

Filed April 23, 1936

Fig. 1.

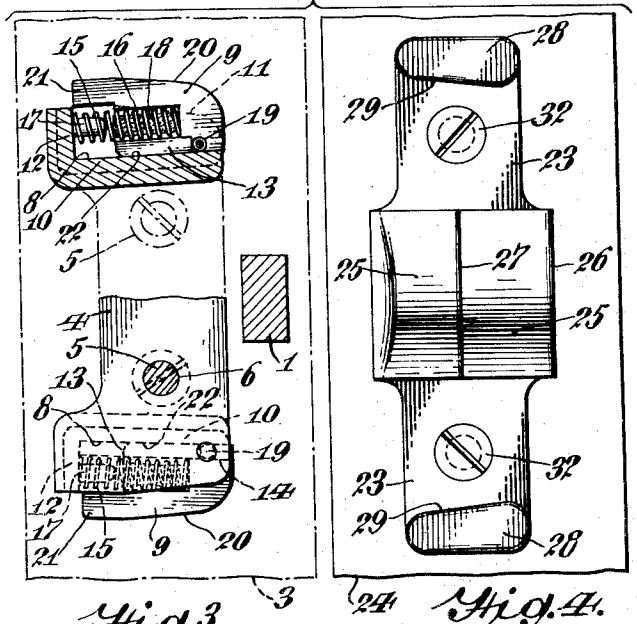


Fig. 2.

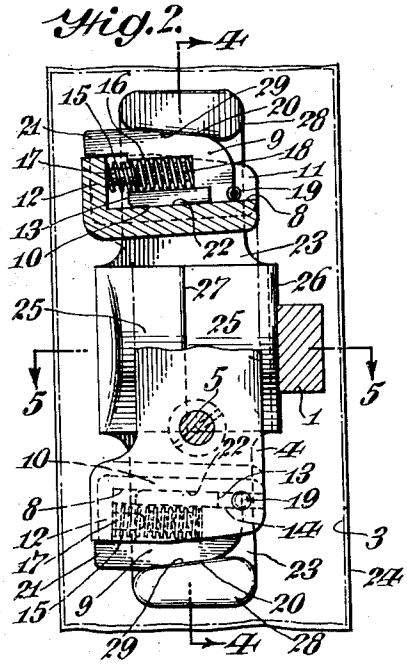


Fig. 3.

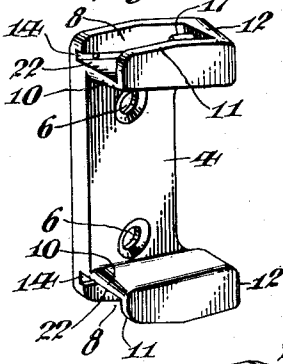


Fig. 4.

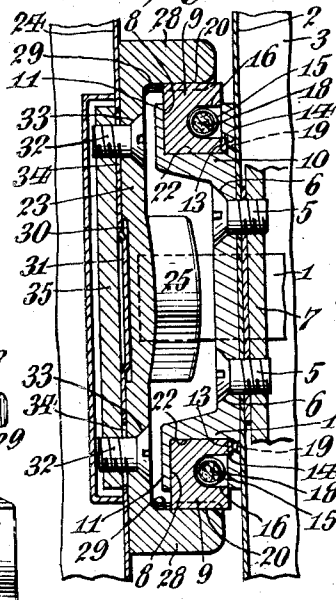


Fig. 5.

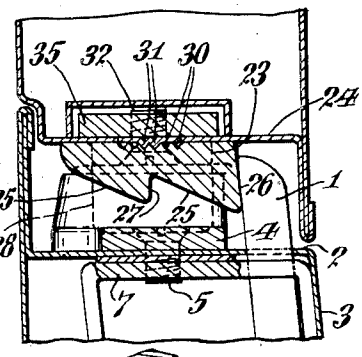


Fig. 6.

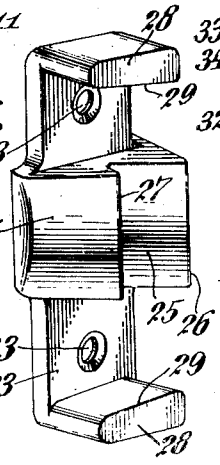


Fig. 7.

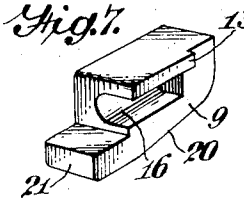
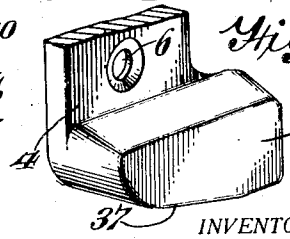


Fig. 8.



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COMBINED LATCH AND DOVETAIL STRUCTURE

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Application April 23, 1936, Serial No. 75,915

3 Claims. (Cl. 16—85)

The improvement has been designed particularly for use with automobile doors. The well-known practice heretofore has been to provide the edge of the door with a spring-pressed retractable latch bolt for cooperation with a latch keeper or striker plate mounted on the door frame, and to provide separate dovetail members, mounted independently of the latch members on the door and door frame respectively, for properly alining the door when it is moved into completely closed position and for preventing undesirable noise or rattling due to vibration of the door with respect to the frame when the door is in its closed position.

In accordance with the present improvement, one of the dovetail members is combined with one of the latch members and the combined structure is secured to the door frame, and the other dovetail member is associated with the other latch member on the free vertical edge of the door. As disclosed herein, the preferable arrangement of the various elements of the device is one in which the wedge member of the dovetail is associated with the latch bolt on the edge of the door, and the socket member of the dovetail is combined as a structural part of the striker plate and is mounted on the door frame. The various elements are also preferably arranged so that the bearing surfaces of the dovetail wedge member are formed on parts that are spaced to receive the latch keeper therebetween, and the bearing members of the dovetail socket are spaced from the striker plate so as to receive the parts of the wedge element between these bearing members and the striker plate.

The invention has for one of its objects the provision of a combined latch and dovetail device which is so constructed as to properly position the door during the final closing movement thereof and to rigidly retain the door in its closed position. Another object of the invention is the provision, in a combined device of this character, of a structure which will properly support the door when in closed position and prevent undesirable vibration thereof with respect to the door frame. A further object of the invention is the provision of a combined latch element and dovetail element wherein the bearing members of the dovetail element are movable relatively to each other into proper make-up position with respect to the bearing members of the other dovetail element as the door is moved into closed position, at the same time forming a rigid support for the door when in its closed position. It is also an object of the invention to provide a combined dovetail and latch structure in which the bearing members of the dovetail wedge element are movable relatively to each other in the direction of movement of the door into and out of closing position. A still further object of the invention is the provision of a combined striker plate and dovetail element wherein the bearing members of one of the dovetail elements are directly supported by the striker plate for adjustment therewith. The invention has for a still further object a reduction in the cost of installation of the latch elements and the dovetail elements upon an automobile.

Other objects and advantages of the invention will be apparent from the following description, taken with the accompanying drawing wherein:

Fig. 1 is a rear elevational view, partly broken away and partly in section, of the dovetail wedge member and associated latch bolt shown in section, and a front elevational view of the combined striker plate and dovetail socket member utilized therewith;

Fig. 2 is a view similar to Fig. 1, showing the parts in the position which they occupy when the door is fully closed;

Fig. 3 is a perspective view, on a reduced scale, of the wedge member of the dovetail structure, with the movable bearing blocks omitted;

Fig. 4 is a vertical sectional view taken on the line 4—4 of Fig. 2;

Fig. 5 is a horizontal sectional view taken on the line 5—5 of Fig. 2;

Fig. 6 is a perspective view, on a reduced scale, of the combined striker plate and dovetail socket member shown in Figs. 1, 2 and 4;

Fig. 7 is a perspective view of one of the movable bearing blocks of the dovetail wedge member; and

Fig. 8 is a perspective view of a modified form of bearing element for the dovetail wedge member.

As illustrated in the drawing, the dovetail wedge member is associated with a spring-pressed retractable latch bolt 1 projecting outwardly from the free vertical edge 2 of the door 3 and having suitable handles mounted on the door for retracting the same from latching position. The wedge member preferably comprises an elongated base plate 4 having one face thereof adapted to be secured to the vertical edge of the door by means of screws 5 extending through openings 6 in the base plate, through alined openings in the edge of the door, and threaded

into a retainer plate 7 on the inside of the edge of the door.

The latch bolt 1 is supported on the door in a position to project outwardly through the edge of the door near the inner face thereof as shown in Fig. 5, and the base plate 4 is positioned on the edge of the door alongside the latch bolt, between the same and the outer face of the door, with the opposite ends thereof spaced substantially equal distances above and below the latch bolt. The opposite ends of the base plate 4 are provided with recesses 8 on the outer face thereof forming guideways for a pair of movable bearing blocks 9. The base plate 4 forms the rear wall of each recess, and each recess is preferably provided with a bottom wall 10 in the form of a ledge arranged transversely of the base plate, a side wall 11 and an end wall 12, all formed integrally with the base plate.

The bearing blocks 9 are inserted in the guideways 8 through the open front ends, and each block is held in its guideway against movement away from the other by means of a retaining rib 13 arranged lengthwise of the edge of the block for engagement within a groove 14 in the rear wall of the guideway. Inward movement of each bearing block 9 in its guideway is resisted by means of a coiled spring 15 having one end seated within a recess 16 in the side of the bearing block adjacent the wall 11 and the opposite end surrounding a pin 17 projecting inwardly from the end wall 12. A cylindrical block 18 of compressible felt or other material having lubricant incorporated therein may be encased within each of the coiled springs 15 for the purpose of lubricating contacting portions of the bearing block, the guideway and the spring. Movement of each bearing block 9 in the opposite direction is limited by a stop pin 19 secured in an opening in the inner wall of the recess with one end projecting into the groove 14 in the path of movement of the outer end of the retaining rib 13, this end of the rib terminating short of the end of the block as will be clear from Fig. 7.

The remote faces of the bearing blocks 9 extend outwardly beyond the free edges of their respective side walls and form bearing surfaces 20 which are preferably spaced substantially equally above and below the latch bolt 1. The bearing surfaces 20 preferably converge toward each other in the direction of the latch bolt in order to form the tapered wedge element of the dovetail structure. The bearing blocks may be provided with a lip portion 21 which is arranged to extend over the edge of the end wall 12 when the blocks are in their retracted position as shown in Fig. 2, and serves to cover the end of the recess 8 when the blocks are in their forward position as shown in Fig. 1.

As shown in Figs. 1, 2 and 3, the surfaces 22 of the walls 10, upon which the blocks 9 are supported, are preferably so arranged as to diverge from each other to a slight extent in the direction of the latch bolt 1 so that the bearing blocks may have a slight movement toward each other as the door moves into fully closed position. This arrangement of the bearing surfaces 22 eliminates the tendency of the bearing blocks to jam against these surfaces during the make-up of the dovetail elements as the door is being closed.

The unitary striker plate and dovetail socket member shown in Figs. 1 and 6 comprises a base plate 23 having the inner face thereof adapted to be secured to the face of the door frame 24. The outer face of the base plate 23 is provided with a plurality of tapered keeper members 25 substantially midway of its ends, the keeper members forming a main catch element 26 with which the latch bolt 1 engages to retain the door in fully closed position, and an auxiliary catch element 27 with which the latch bolt may engage to retain the door in partly closed position. The inclined faces of the keeper members 25 are preferably curved to a slight extent in a vertical direction in order to prevent the corners of the beveled end of the latch bolt from contacting therewith when the bolt and striker plate are not properly alined.

A rigid bearing member 28 is formed on each end of the base plate 23 on the outer face thereof. The bearing members 28 are in alinement with the striker plate and each is spaced from the striker plate to such an extent that the cooperating bearing block 9 and its guideway 8 may freely enter between the same and the striker plate. The opposing faces of the fixed bearing members 28 are provided with diverging bearing surfaces 29 with which the converging bearing surfaces 20 on the remote faces of the bearing blocks 9 engage as the door moves into closed position.

The inner face of the base plate 23 is preferably provided with a plurality of vertically arranged grooves 30 for cooperation with corresponding ribs 31 pressed outwardly from the door frame 24. The combined striker plate and dovetail socket member is retained in position on the door frame 24 by means of screws 32 extending through suitable openings 33 in the base plate, through enlarged openings 34 in the door frame, and threaded in a retainer plate 35 on the inside of the door frame as shown in Figs. 4 and 5. With such a structure it will be apparent that the combined striker plate and socket member may be readily adjusted both vertically and horizontally with respect to the door frame in order that it may be properly positioned to cooperate with the latch bolt and the dovetail wedge member.

When the device is in use with a door and its frame, the bearing surfaces 20 of the two slidable bearing blocks 9 engage with the bearing surfaces 29 of the dovetail socket member substantially simultaneously when the door is moved into its closed position, if the door is in proper alinement with the door frame and the combined striker plate and dovetail socket member is adjusted on the door frame for proper cooperation with the latch bolt and associated dovetail wedge member. In case the door is slightly out of alinement, the bearing surface 20 of one of the slidable bearing blocks will first contact with the cooperating bearing surface 29 on one of the fixed bearing members 28 and this bearing block will be forced backwardly in its guideway until the resistance offered by its spring to further movement is sufficient to bring the door into proper alinement, with both bearing surfaces 20 in contact with the corresponding bearing surfaces 29 of the socket element. Thereupon the two bearing blocks 9 move backwardly in their respective guideways until the dovetail elements are completely made up and the parts are in position for the latch bolt to engage with the main catch element to retain the door in its closed position.

When the door is unusually heavy, or for some other reason has a tendency to sag to an unusual extent, it may be desirable to utilize a fixed bearing member in place of the movable bearing block 9 at the lower end of the dovetail wedge member. A form of fixed bearing member suitable for this purpose is illustrated in Fig. 8 of the drawing.

In this form the guideway at the lower end of the base plate 4 is omitted and a rigid bearing member 36 is formed on the base plate instead. An inclined bearing surface 37 is provided on bearing member 36 for cooperation with the bearing surface 29 of the lower bearing member 28. With this form of wedge member a sagged door is lifted into proper closing position when the bearing surface 37 comes into contact with the lower bearing surface 29, and the upper bearing block 9 yields inwardly, when it engages the upper bearing member 28, to permit proper make-up of the dovetail so that the door may be fully closed.

While specific forms and arrangements of the various parts of the improved structure have been disclosed, it is to be understood that the disclosure is illustrative only and that changes in form and arrangement of the elements may be made without departing from the invention, the scope of which is to be determined by the appended claims.

What is desired to secure by Letters Patent is:

1. A dovetail wedge member comprising an elongated base plate having one face thereof adapted to be secured to the edge of a door and a guideway on the opposite face at each end thereof, the guideways being spaced from each other to receive a striker plate therebetween, a pair of bearing blocks slidably mounted in the guideways and having bearing surfaces projecting from the guideways on the faces of the blocks remote from each other, rigid means for limiting sliding movement of the blocks in one direction, and resilient means for resisting sliding movement of the blocks in the opposite direction.

2. A dovetail wedge member comprising an elongated base plate having one face thereof adapted to be secured to the edge of a door, a ledge extending transversely of said base plate on the opposite face thereof adjacent each end, the ledges being spaced from each other to receive a striker plate therebetween, a pair of bearing members slidably supported on the surfaces of said ledges remote from each other, the faces of said bearing members remote from each other converging in one direction, resilient means for resisting movement of said bearing members in the opposite direction, and means for retaining said bearing members on said ledges.

3. A dovetail wedge member comprising an elongated base plate having one face thereof adapted to be secured to the edge of a door, a ledge extending transversely of said base plate on the opposite face thereof adjacent each end, the ledges being spaced from each other to receive a striker plate therebetween, the faces of the ledges remote from each other forming bearing surfaces converging in one direction, a rigid bearing member slidably supported on each of said bearing surfaces, resilient means for opposing movement of said bearing members in said direction, the faces of the bearing members remote from each other converging in the opposite direction.

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