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J. J. SEITZ

1,990,141

DOOR RETAINER

Original Filed Jan. 16, 1931

Fig. 1.

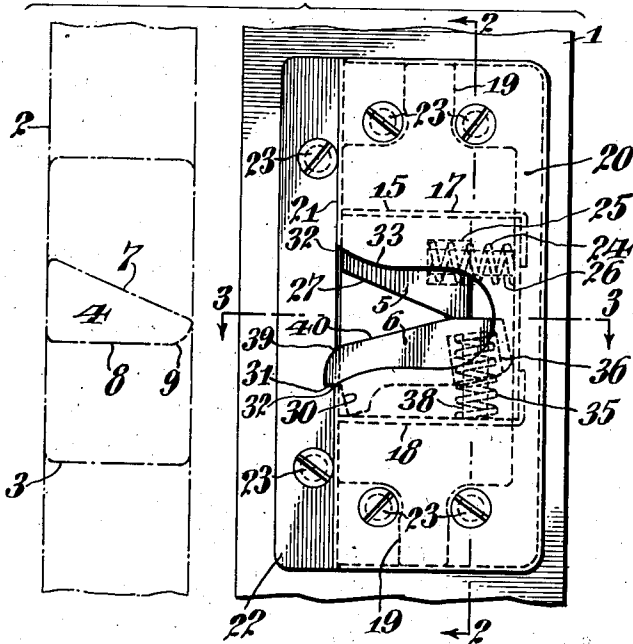


Fig. 2.

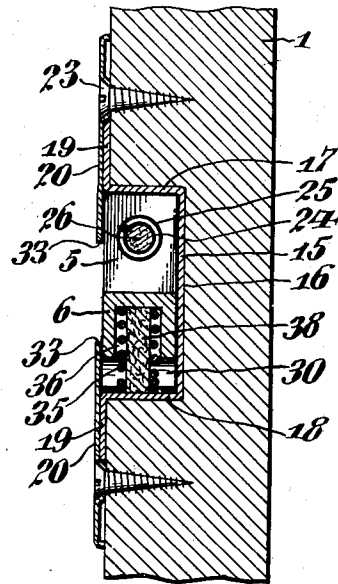


Fig. 3.

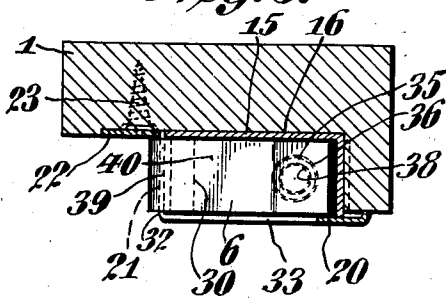
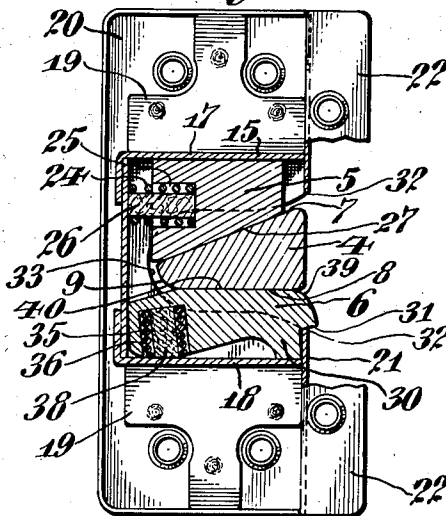


Fig. 4.



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DOOR RETAINER

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10 Claims. (Cl. 16—85)

My invention relates to door retainers of the character commonly known in the trade as "dovetails". Such retainers are employed for holding doors when the latter are in closed position and are especially adapted for use in connection with the doors of automobiles or other like structures to prevent vibration of the doors to thereby eliminate rattling or other annoying sounds.

members located upon the opposite sides of a recess or socket for receiving a tongue or projection, the said pivoted and slidable members being so correlated and so co-acting as to support the projection or tongue rigidly to thereby prevent vibration of a door such as that of an automobile or other like structure relatively to the door frame.

Without undertaking to further set forth and amplify the various objects and advantages of the invention I shall proceed with a detailed description thereof wherein other objects and advantages will be referred to with particularity or else will become apparent.

In order that the invention may be readily understood and its practical advantages fully appreciated reference should be had to the accompanying drawing wherein I have illustrated an embodiment of the invention in the form at present preferred by me. However, it should be understood that the invention is capable of embodiment in other forms of construction than that shown and that changes in the details of construction may be made within the scope of the claims without departing from the invention or the principle thereof.

In the drawing:

Fig. 1 is a view showing in elevation a door retainer embodying the invention and also showing a portion of one side of the door frame and in dash and dot lines a portion of the outer edge of a door having thereon a projection or tongue which is adapted to engage the retainer;

Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a horizontal transverse sectional view taken on the line 3—3 of Fig. 1; and

Fig. 4 is a vertical sectional view of the retainer taken in a plane extending in approximately right angular relation to that in which Fig. 2 is taken.

In the drawing I have shown at 1 a portion of one of the side members of the frame of a door opening such as that provided in the body of an automobile. A portion of the door for closing the door opening is indicated by dash and dot lines at 2, the outer swinging edge only being shown. A plate 3 fastened to the edge of the door is provided with a tongue or projection 4 which is adapted to engage the movable bearing members 5 and 6 of the retainer. The upper side of the tongue or projection 4 is inclined downwardly as indicated at 7, while the lower side thereof is located in a plane which is substantially at right angles to the door proper, as indicated at 8. The rear edge portion of the lower side is rounded as

Many attempts have been made to provide door retainers of a character to perform the function above indicated with respect to the device of my invention but as far as I am aware none of the devices heretofore produced has been entirely satisfactory. In one form of device rubber or other like cushioning means has been employed for the purpose of holding the opposite sides of a projection or tongue mounted upon the outer swinging edge portion of the door, but when such devices have been in use for a considerable length of time the rubber loses or may lose its elasticity to thereby render the device ineffective.

It also has been proposed to support the projection or tongue between engaging and supporting parts which are immovable vertically but for one reason or another such constructions have not proved to be entirely satisfactory.

It is desirable that a door retainer be provided having means which operates, after a door has been closed and engaged by a catch such as is usually employed for holding the same in closed position, to hold the said door firmly and rigidly against vertical movements with respect to the relatively stationary frame of a door opening. Hence, it is a general object of the invention to provide a door retainer having yielding means for engaging a projection or tongue carried either upon the outer swinging edge of a door or upon a member of the door frame which, after the door is completely closed and engaged by the usual catch for holding the same in closed position, is rigid and is unyielding or practically so in vertical directions away from the projection or tongue which is engaged therewith.

It also is an object of the invention to provide a door retainer adapted for use upon automobiles and other like structures for holding the doors thereof after they have been moved into closed position rigidly against vibratory movements relatively to the door frame and which also acts upon release of the catch by which the door is held in closed position to cause opening movement of the door.

A further object of the invention is to provide a door retainer comprising pivoted and slidable

indicated at 9 to facilitate the entry of the projection or tongue 4 into position between the bearing members 5 and 6 of the retainer.

The retainer comprises a casing 15 preferably of sheet metal which is mounted within a recess or opening 16 provided in the inner side of the side member 1 of the door frame. The opposite end walls 17 and 18 of the casing are provided at their outer edges with projections 19 to which a cover plate 20 is secured by spot welding or otherwise as may be preferred. The cover plate 20 has at its front edge a flange 21 the edge of which terminates in a forwardly extending flange 22 which is seated in a depression formed in the member 1 as shown in Fig. 3. The casing together with the cover plate 20 is secured to the member 1 of the door frame by means of screws 23 in known manner. The bearing member 5 is movable back and forth transversely of the casing 15. The outer side thereof is maintained against the inner side of the end wall 17 of said casing, by reason of the contact provided between its lower face, or a portion thereof, and the bearing member 6 or the tongue 4. It will be apparent that the said bearing member is immovable in a vertical direction or outwardly from the horizontal center line of the said casing. The front end of the bearing member 5 normally (that is, when not engaged by the projection 4) is held against the inner side of the flange 21 of the top cover plate 20 by the action of a coiled spring 24. Said spring is located in the rear portion of the casing with one end thereof seated against the rear wall thereof, while the other end thereof extends into and is seated against the bottom of an opening 25 provided in the rear end of the said bearing member 5. In order to lubricate the spring and the opening in which it is located I employ a wick 26 of suitable compressible elastic material which is saturated with a lubricant. When the bearing member or block 5 is pushed rearwardly by the engagement of the inclined face or surface 7 of the tongue 4 with the correspondingly inclined face 27 upon the said member or block, the spring 24 and the wick 26 are compressed. A portion of the force exerted by the spring 24 in its tendency to expand acts upon the tongue 4 and tends to cause disengaging movement of the projection 4 and opening movement of the door upon which said projection is mounted.

For cooperation with the bearing member or block 5 I have provided the pivoted or rocking bearing member 6 which is located in the casing 15 in opposed relation to the bearing member or block 5. The pivoted or rocking member 6 is provided in adjoining relation to its front end with an outwardly extending projection 30 which is in contact at all times with the inner side of the end wall 18 of the casing 15 in adjoining relation to the front end thereof. The end of the pivoted member 6 extends a short distance beyond the projection 30 to thereby provide a shoulder 31 which is seated against the adjoining edge of an opening 32 through the flange 21 of the top plate 20. The said top plate is also provided with an opening 33 which in effect is a part of the opening 32. The purpose of the openings 32 and 33 is to permit the entry of the projection or tongue 4 into the casing 15 between the members 5 and 6. The inner surface of the front portion of the pivoted member 6 is angularly related to the inner surface of the rear portion thereof as shown in the drawing. Normally (that is, when not engaged by the projection 4), the inner side of the rear portion of the pivoted member 6 is

held by a spring 35 against the inner side of the rear portion of the bearing member or block 5. This relationship is shown in Fig. 1 of the drawing. The outer end of the spring 35 is seated against the inner side of the end wall 18 of the casing 15 while its opposite or inner end is seated against the bottom of an opening 36 provided in the outer side of the rear end portion of the said pivoted or rocking member 6. For the purpose of lubricating the spring 35 and the opening within which the inner end portion thereof is located, I employ a wick 38 of suitable compressible elastic material which in practice should be saturated with a suitable lubricant.

Upon the entry of the tongue 4 into the casing 15 the lower part of the rear rounded edge portion of the projection 4 contacts with the upper portion of the correspondingly rounded front end portion 39 of the pivoted bearing member 6. The entry of the projection or tongue 4 between the members 5 and 6 causes rearward sliding movement of the member 5 in the direction of movement of tongue 4 and in opposition to the resistance or force offered by the spring 24, and at the same time causes pivotal or rocking movement of the pivoted bearing member 6 in opposition to the resistance or force offered by the spring 35. When the door is completely closed with the projection or tongue 4 in approximately the position shown in Fig. 4 of the drawing, the outer side of the rear end portion of the pivoted member 6 will or preferably should contact with the inner side of the rear end portion of the end wall 18 of the casing 15. If the outer side of the rear end portion of the said pivoted member 6 should not, when the door is in closed position, contact with the inner side of the end wall 18 of the casing 15 then the coiled spring 35 should be of such dimensions that the adjoining coils thereof will be in contact with each other so that in either case the rear end portion of the pivoted bearing member 6 is held positively against outward movement after the door has been closed.

It will be apparent that by my invention I have provided means of a character such that when the door is in closed position with the tongue or projection 4 thereof in engagement with the bearing members 5 and 6 both of said members are held positively and absolutely against outward or longitudinal movements in directions away from the center transverse line of the casing or away from the projection or tongue 4, so that there can be no relative vertical vibratory movement between the door and the casing 15. This is accomplished notwithstanding the fact that the bearing member 6 is pivotally mounted within the casing.

When the rear end portion of the pivoted or rocking bearing member 6 has reached the limit of its outward movement the portion of the surface 40 upon the inner side of the front end portion of the member 6 will be in a plane substantially parallel with the plane of the cooperating face 8 of the tongue 4 as shown in Fig. 4 of the drawing.

The force exerted by the spring 35 due to its tendency to expand acts through the projection or tongue 4 against the inclined inner side 27 of the bearing block 7 so that a component of such force acting in a horizontal direction tends to cause outward or disengaging movement of the projection or tongue 4. Simultaneously a portion of the force exerted by the compressed spring 24, acting through the bearing member 5, tends

to cause outward or disengaging movement of the tongue 4. These forces are transmitted to the door through the projection or tongue 4 and tend to open the door. The result of these forces upon the door is to hold the catch members (not shown) of the door and the door frame, which operate to hold the door in closed position, in continuous close contact with each other to thereby prevent rattling.

It will be seen that by my invention I have provided a door retainer comprising a slidable bearing member which is unyieldingly held against outward movement and a pivoted bearing member which is yieldable outwardly upon the entering movement of the tongue or projection 4 into position between the said bearing members, but which, when the door has reached a closed position, is held against further outward movement. By this means the door is held positively against relative vibratory movements in a vertical plane. It also will be seen that both of the bearing members tend to cause disengagement of the projection or tongue 4 thereby tending to cause opening movement of the door which becomes effective when the catch employed for holding the same in closed position is released.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A door retainer comprising a casing, having an opening in one longitudinal edge to receive a co-operating tongue, a bearing member slidably mounted for movement therein in the direction of movement of the tongue, and a second bearing member pivotally supported at its outer end in the said casing for movement of its inner end substantially transversely of the direction of movement of the said slidable bearing member and the tongue.

2. A door retainer comprising a casing, a bearing member slidably mounted for movement back and forth transversely of the said casing, the outer side of said bearing member contacting with a portion of said casing, a rocking bearing member located in said casing in opposed co-operative relation to the slidable bearing member and having its front end supported against movement away from said slidable bearing member, the rear end of the said second named bearing member rocking about a point in adjoining relation to its front end in a direction substantially transversely of the direction of movement of said slidable bearing member, and means for limiting the outward rocking movement of said rocking bearing member.

3. A door retainer comprising a casing having upper and lower walls, a bearing member located in said casing with one side thereof in slidable engagement with the upper of said walls for movement transversely of said casing, a rocking bearing member located in the said casing in opposed co-operative relation to the slidable bearing member for movement of the rear end thereof longitudinally of said casing, said rocking bearing member having a portion upon the inner side of its front end which contacts with the inner side of the lower wall and about which the said rocking bearing member rocks, and means for limiting the outward movement of the rear end portion of said rocking bearing member.

4. Door retaining means comprising, in combination, a casing, a bearing member slidably mounted in said casing, the inner side of the said bearing member being inclined from the rear toward the front end thereof, a rocking bearing member located in the said casing in opposed

co-operative relation to the said slidable bearing member, the said rocking bearing member being movable about an axis located at the front end thereof, means for limiting the outward movement of the rear end portion of said rocking bearing member, and a projection for engagement with the inner opposing sides of said bearing members, one side of said projection being inclined to engage with the inclined side of the first named bearing member and the opposite side thereof being in a plane substantially parallel with the plane of movement of the slidable bearing member and engaging the inner side of the rocking bearing member, the entry of said projection between the said bearing members causing rocking movement of the said rocking bearing member in an outward direction until such movement is stopped by the said means for limiting such outward movement.

5. Door retaining means comprising, in combination, a casing, a bearing member slidably mounted in said casing, the inner side of said bearing member being inclined from the rear to the front end thereof, a rocking bearing member located within said casing in co-operative relation to the said slidable bearing member, the said rocking bearing member having contact at a point at the front end of its outer side with a portion of the said casing about which point the said rocking member is adapted to rock, a projection which is adapted to enter between the said bearing members, one side of said projection being inclined from its front toward its rear end for engagement with the inclined side of the first named bearing member, the opposite side of said projection being in a plane substantially parallel with the plane of movement of the slidable bearing member and adapted to engage the inner side of a portion of the said rocking bearing member, the entry of said projection between the said bearing members causing the first named bearing member to slide rearwardly and the second bearing member to rock about a point at the front end of the outer side thereof, means for limiting the outward rocking movement of the said rocking member, yielding resilient means tending to cause movement of the first named bearing member toward the front of the retainer, and yielding resilient means tending to cause inward rocking movement of the rear end of the said rocking member.

6. In a door retainer, the combination with a projection secured to the free edge of the door, of a slidable bearing member mounted on the door frame for movement in the direction of movement of said projection as the door is opened and closed, a second bearing member mounted at one end on the door frame for rocking movement of the opposite end transversely of the direction of movement of the slidable bearing member, and resilient means tending to oppose movement of the bearing members when said projection is moved into position therebetween.

7. In a door retainer, the combination with a projection secured to the free edge of the door, of a casing secured to the door frame and having an opening therein to receive said projection, a bearing member slidably mounted in said casing in the direction of movement of said projection to and from said casing, a second bearing member mounted at one end in the casing for rocking movement of the opposite end to and from said first mentioned bearing member, and resilient means in the casing tending to oppose movement

of the bearing members when said projection is moved into position therebetween.

8. In a door retainer, the combination with a projection secured to the free edge of the door, of a pair of bearing members for engagement with the opposite faces of said projection, one of said bearing members being slidable in the direction of movement of the projection as the door is opened and closed, the other bearing member being pivotally mounted at its front end for rocking movement of the opposite end transversely of the direction of movement of the projection on the door, and resilient means tending to oppose movement of the bearing members when said projection is moved into position therebetween.

9. In a door retainer, the combination with a projection secured to the free edge of the door, of a bearing member slidably mounted on the door frame for movement in the direction of movement of said projection as the door is opened and closed, a second bearing member supported at its outer end on the door frame for rocking movement of its inner end to and from the first

bearing member, and means for maintaining the outer end of the second bearing member spaced from the first bearing member when the projection is out of position between said bearing members.

10. In a door retainer, a casing having an opening in one wall thereof to receive a tapered tongue, an upper bearing member mounted in the casing for transverse movement therein in the direction of movement of the tongue and having a tapered lower face cooperating with said tapered tongue, a lower bearing member having its outer end spaced from and supported against movement away from said upper bearing member and its inner end movable toward and away from said upper bearing member, resilient means opposing movement of the inner end of said lower bearing member away from said upper bearing member, and a rigid support for the inner end of said lower bearing member when said tongue is in position between said bearing members.

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