

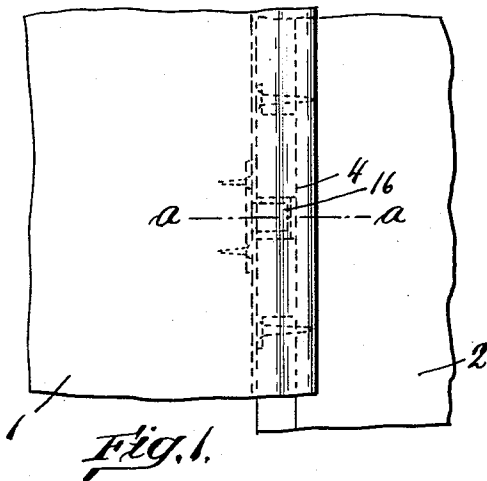
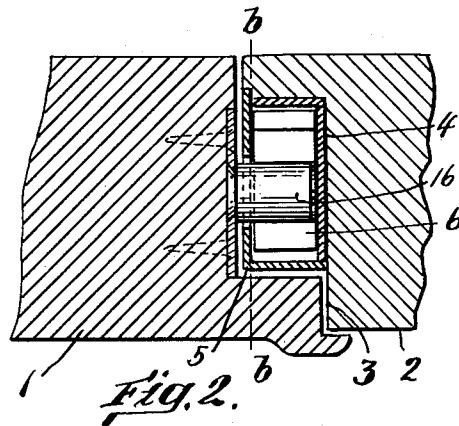
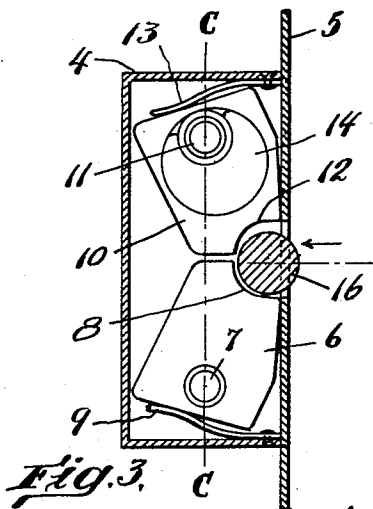
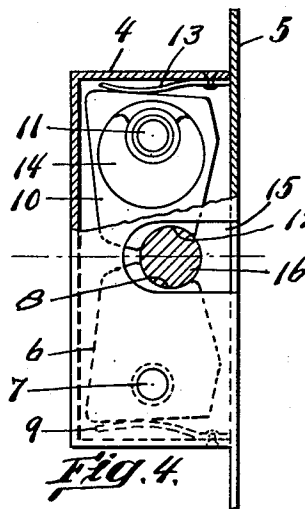
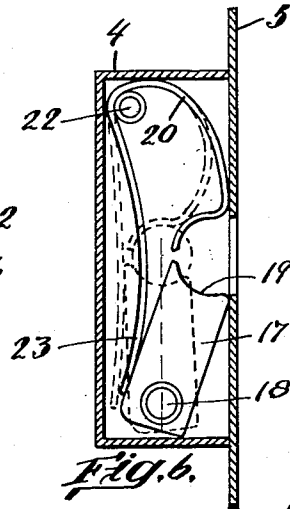
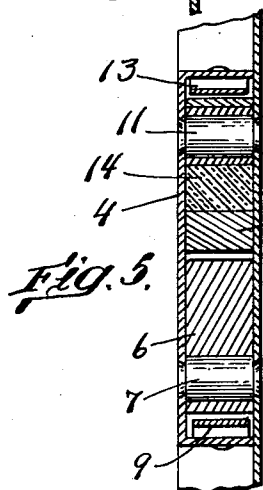
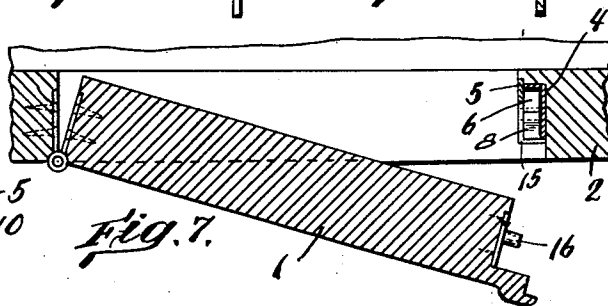
Dec. 28 , 1926.

1,612,480

G. W. WELLS

ANTIRATTLER FOR DOORS

Filed Nov. 21, 1923



Inventor,
George W. Wells,
by L. L. Hamman
Att'y

UNITED STATES PATENT OFFICE.

GEORGE W. WELLS, OF AMESBURY, MASSACHUSETTS.

ANTIRATTLER FOR DOORS.

Application filed November 21, 1923. Serial No. 676,020.

This invention relates to that class of devices which are primarily designed to prevent the doors of closed automobile bodies from rattling, but which may be used in connection with other forms of doors or gates which swing horizontally.

Prior to my invention, various means for preventing vibration or rattling of automobile body doors in their casings, have been provided, and so far as I am aware, these devices have involved the employment of a wedging action or frictional engagement, one of the chief objections to which is that they not only require the exercise of considerable force to close the door, but also require a corresponding force to open it, which, coupled with the usual tendency of doors to bind in the casing often makes them difficult to open. There is also a marked tendency of doors of this character to sag and bind on the sill, particularly after use to an extent which causes the strain of the door on its hinges to weaken their supporting effect.

The objects of my invention are to provide an antirattling device for doors which will not only be effective in preventing rattling of the door in its casing, but will also permit closing and opening of the door without the exercise of an objectionable amount of force, and which will not only have no tendency to obstruct the opening of the door when unlatched, but will also assist in the first part of the opening movement.

Further objects of my invention are to provide a simple and effective means for so supporting a door, when closed, that all strain on the hinges, which would tend to cause the door to sag, will be removed, and for holding the door against upward movement and in firm engagement with said supporting means, so that rattling will be prevented.

I accomplish these objects by providing means for engaging the door during the latter portion of its closing movement which, while yieldably resisting the closing action, will exercise a corresponding force tending to open the door when it is unlatched, so that the door may be opened without difficulty which means automatically tends to lift the door slightly at the end of its closing movement, and to support it so that all strain is removed from the hinges, together with other engaging means which effectively resists movements of the door away from said supporting means.

For a more complete understanding of my invention, reference is made to the accompanying drawing in which:

Fig. 1 is a side elevation of a door and door casing to which an embodiment of my invention has been applied.

Fig. 2 is a sectional view on the line *a-a* of Fig. 1.

Figs. 3 and 4 are sectional views at line *b-b* of Fig. 2, showing the parts in different positions.

Fig. 5 is a sectional view at line *c-c* of Fig. 3.

Fig. 6 is a view similar to Fig. 3 showing a modified form of the invention.

Fig. 7 is a sectional plan view of a door and its casing to which an embodiment of my invention has been applied.

As indicated in the drawing, the door 1 is arranged to swing horizontally to and from the door frame or casing 2, said frame having the usual rabbeted edge 3 and the door being correspondingly shaped, as is customary.

According to my invention, I provide a rectangularly shaped metal casing 4, which is adapted to be set into a correspondingly shaped recess, opening at the side of the casing and to the bottom of the rabbet therein, said casing having a cover plate 5, which extends over the outer side and front end and which is adapted to be secured to the door frame to hold the casing in place. A dog 6 is mounted at its lower end to swing on a pivot 7, which is rigidly supported in the lower end of the casing 4, said dog having a segmental recess 8 in its upper end and having a spring 9 arranged to engage its lower end and hold its front side against the front portion of the cover plate 5, in which position the dog will be inclined outward from the vertical. A dog 10, of similar shape to the dog 6, is mounted to swing on a pivot 11 in the upper end of the casing and to depend therefrom directly over the dog 6, said dog 10 having a segmental recess 12 in its lower end corresponding to the recess 8 and being normally held by a spring 13 with its front side in engagement with the front portion of the cover plate 5, in which position it will be inclined outward from the vertical, with its recess 12 directly over the recess 8 in a complementary position relative thereto. The pivot 11 is extended into the upper portion of a circular rubber bushing 14, which is mounted in the dog 10, so that the latter is

permitted to yield upwardly from its normal position. The cover plate 5 is cut away to form an opening 15 at its side and front opposite the recesses 8 and 12 and a cylindrical pin 16 is rigidly mounted in the opposite edge portion of the door from its hinges and in position to project horizontally therefrom, and to enter the opening 15 when the door is closed. The radius of curvature of the bottoms of the recesses 8 and 12 and of the surface of the pin 16 is the same.

With the above described construction, the pin 16 will preferably be set in the door in such a position relative to the dog 6, that, when the door is closed and the pin 16 is swung horizontally into the opening 15 of the casing, it will first engage the dog 6 in the bottom of its recess 8, and at practically the same instant it will also engage the bottom of recess 12 in dog 10, so that, during the remainder of the closing movement, the dogs will be swung inward from the position of Fig. 3 to that of Fig. 4, in which latter position the center of the pin 16 will be nearly over the center of the pivot of the lower dog 6, so that the weight of the door has only a comparatively slight tendency to swing the dog outward. During this movement, as the dogs are swung inward, the bottom of the recess 8 of the lower dog will be moved and tilted downward, so that the pin 16 will be grasped therebetween. As the dog 6 is mounted on a rigid pivot, it will have a lifting action on the pin and consequently on the door as it is swung towards the vertical. The parts are so arranged that, by the time the door is closed, all sagging strain of the door on the hinges will be relieved, and tendency to bind on the sill will be prevented.

As the pivotal connection of the lower dog 6 with the casing is non-yielding so that its lifting action on the pin 16 is positive, and as the seat portion of the upper dog 10, which engages the upper side of the pin, tends to move downward, as it is swung rearward, the dog 10 will be forced bodily upward to a sufficient extent to permit this movement, the necessary upward movement of the dog 10 being permitted by the presence of the rubber bushing 14. At the end of the closing movement of the door the pin will be firmly clamped between the dogs, or jaws which they form and a solid or rigid support will be provided for the pin at its under side, while it will be securely held against upward movement by the yieldably actuated upper dog. As a result, vibration of the door with relation to its casing will be prevented.

With this arrangement, moreover, while the closing movement is against the action of the springs 9 and 13, the force which is stored up therein when the door is closed

becomes effective to open it when the door is unlatched. The frictional resistance to the closing and opening movement is also practically inappreciable, on account of the fact that the dogs swing on pivots, and the engagement of the pin 16, with the dogs is, in effect, a pivotal engagement.

In Fig. 6 a somewhat modified form of my invention is illustrated. In this form, a lower dog 17, similar to the dog 6, is mounted to swing on a rigidly supported pivot 18, said dog having a segmental recess 19 in its upper end. In lieu of the upper dog 10, I provide a flat spring 20, which is bent to form a curved engaging portion 21, which is held in the position corresponding to the recessed end portion of the dog 10, said spring being bent in U-form and supported on a pin 22 in the upper end of casing, said pin 22 acting as pivotal center for the engaging portion 21. The opposite portion of the spring is extended to form a spring finger 23, which engages the rear side of the dog 17, and normally holds the latter in position to be engaged by the pin 16, on the door. The action is similar to that already described, the normal position of the parts being shown in full lines in Fig. 7. The dog 17, and engaging portion 21 of spring 20 are swung rearward simultaneously by pin 16, this movement being opposed by the spring 20, and the engaging portion 21 being adapted to yield upward. The parts will be moved to the dotted line position of Fig. 6, in which position the pin 16 will be rigidly supported by the dog 17 and held against upward movement by the spring 20 in a manner similar to that already described. When the door is unlatched, to open it, the tension which has been stored in the spring 20 will be effective in assisting the first part of the opening movement.

In this construction, as shown in the dotted line position of Fig. 6, the arrangement is such that, when the door is closed, the center of the pin 16 will be directly over the center of the pivot 18, or on dead center, so that gravity action of the door on the dog 17 has no tendency to swing the dog outward under these conditions. This construction differs from the previously described construction in which the pin 16 is not moved quite to the dead center position. Each arrangement possesses certain advantages over the other and either is within the scope of my invention.

The construction of Fig. 6 is believed to be as effective as that of Fig. 3 for all practical purposes, and is less expensive to manufacture.

I claim—

1. In combination with a horizontally swinging door and its casing, a horizontally projecting cylindrically shaped pin fixed on the door at its edge opposite its hinged edge,

a pair of jaws mounted to swing on said casing above and beneath, respectively, the level of said pin and extending towards each other with their ends in proximity, each jaw having a segmental shaped recess in its end adapted and arranged to receive opposite portions of said pin and said jaws being normally actuated to swing outwardly and to be held in outwardly inclined positions to receive said pin in the said recesses thereof, as the door is swung into the casing, whereby, on continued closing movement of the door, said jaws will be swung inwardly and forced into clamping engagement with said pin.

2. In combination with a horizontally swinging door and its casing, a horizontally projecting cylindrically shaped pin fixed on the door at its edge opposite its hinged edge, a pair of jaws mounted to swing on said casing above and beneath, respectively, the level of said pin and extending towards each other with their ends in proximity, each jaw having a segmental shaped recess in its end adapted and arranged to receive opposite portions of said pin and said jaws being normally actuated to swing outwardly and to be held in outwardly inclined positions to receive said pin in the said recesses thereof, as the door is swung into the casing, whereby, on continued closing movement of the door, said jaws will be swung inwardly and forced into clamping engagement with said pin, the uppermost of said jaws being upwardly yieldable and the lowermost thereof being non-yieldable with relation to their respective pivotal connections, to provide a rigid support for the pin and yieldably actuated means for holding it against said support.

3. In combination with a horizontally swinging door and its casing, a dog pivotally mounted at its lower end on said casing to swing vertically and having an upwardly facing seat at its upper end, means for normally holding said dog in a position inclined from the vertical, a horizontally extending projection rigidly mounted in the door opposite its hinges and arranged to be carried into engagement with said seat as the door is swung towards its closed position, to swing the dog towards the vertical and cause it to press upwardly against the under side of said projection during the further closing movement of the door, and a resilient arm mounted in the casing above said dog and depending in opposite relation thereto, said arm having a seat in its lower end portion arranged to engage the upper portion of said projection as the door is closed and being actuated to press downwardly and outwardly thereon.

4. In combination with a horizontally swinging door and its casing, a horizontally extending projection rigidly mounted in

the door opposite its hinges, and a pair of jaws mounted on the casing in position respectively to grasp said projection at its upper and under sides and to be forced into engagement therewith as the door is swung into the casing, the lowermost of said jaws being arranged to act as a rigid support for the door in the closed position thereof and the uppermost jaw comprising a resilient arm arranged to press its projection engaging portion downwardly against the lower jaw and outwardly to actuate the door towards its open position.

5. In combination with a horizontally swinging door and its casing, a dog pivotally mounted at its lower end and having an upwardly facing seat at its upper end, a rigid projection on the door arranged to engage said seat during the latter portion of its closing movement and to be lifted by said dog, as its closing movement is continued, so as to be rigidly supported thereby and a resilient arm mounted on the casing above said dog and depending in opposite relation thereto, said arm having a downwardly and outwardly facing seat arranged to engage said projection at its upper and inner side and to yield inwardly and upwardly against its resilient action during said closing movement of the door.

6. In combination with a horizontally swinging door and its casing, a dog pivotally mounted at its lower end and having an upwardly facing seat at its upper end, a rigid projection on the door arranged to engage said seat during the latter portion of its closing movement and to be lifted by said dog, as its closing movement is continued, so as to be rigidly supported thereby and a resilient arm mounted on the casing above said dog and depending in opposite relation thereto, said arm having an inwardly and downwardly extending end portion and being resiliently actuated to swing outwardly to hold said end portion in position to be engaged by the upper and inner portions of said projection simultaneously with the engagement thereof by said dog and to have its end portion yield upwardly as it is swung inwardly.

7. In combination with a horizontally swinging door and its casing, a dog pivotally mounted at its lower end and having an upwardly facing seat at its upper end, a rigid projection on the door arranged to engage said seat during the latter portion of its closing movement and to be lifted by said dog, as its closing movement is continued, so as to be rigidly supported thereby, a spring mounted on the casing having an outwardly bowed portion arranged at the inner side of the dog in position for yieldably resisting the inward swinging movement thereof and having an arm portion depending in opposite relation to said dog and hav-

ing an end portion arranged to be engaged by said projection in position to yieldably resist inward and upward movement of said projection.

- 5 8. A door holding device comprising a casing having a dog pivotally mounted at its lower end therein and having a seat at its upper end adapted to engage the under side of a projection on the door and a spring
10 having a bowed portion disposed at the inner side of the casing in position to engage

said dog to swing it outwardly and having an arm portion extending downwardly from the upper portion of the casing, said arm portion having an end portion arranged to yieldably engage the upper and inner sides of the door projection to press it downwardly and outwardly. 15

In testimony whereof, I have signed my name to this specification.

GEORGE W. WELLS.