July 16, 1929. L. THIRY 1,721,288

HINGE

Filed April 26, 1927

Fig. 1

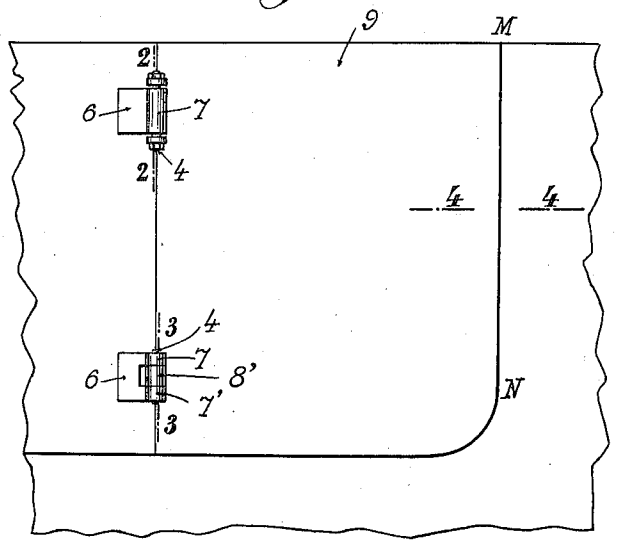


Fig. 2

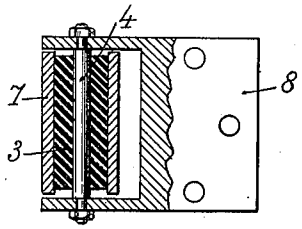


Fig. 3

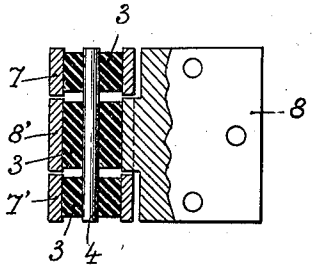
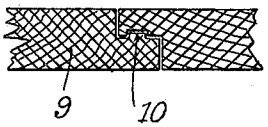


Fig. 4



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INVENTOR;
By
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Patented July 16, 1929. 1,721,288

UNITED STATES PATENT OFFICE.

LEON THIRY, OF HUY, BELGIUM.

HINGE.

Application filed April 26, 1927, Serial No. 186,662, and in Belgium May 4, 1926.

The present invention relates to hinges and other pivot joints for vehicle doors, windows and the like. It is a known fact that in a vehicle, and for instance in a motor vehicle, the doors exercise wrenching stresses upon their pivot pins due to the deformation of the vehicle body and frame, and by reason of the play which is thus produced, the doors will close in a defective manner and will be subject to a disagreeable rattling.

My invention relates to a hinge in which a piece of india rubber or other elastic substance is placed between the pivot pin and the socket or sockets of the hinge, the said piece strongly adhering to said pivot pin and sockets in such manner that the pivotation of the sockets on the pivot pin, or inversely, is obtained solely by the circular molecular deformation of said elastic piece.

In this manner I do not only obviate all friction in the hinge, but the pivot pin may move in transverse and radial directions without any deformation of the metallic parts and without play, such movements being entirely taken up by the elastic substance.

The adhesion of the elastic member to the metallic parts of the hinge may be obtained by forming the said member as a ring which during the assembling of the device is subjected to a strong radial compression between the pivot pin and the socket or sockets, and this compression causes the axial elongation of the ring, while at the same time permitting the free movements of pivotation on the pivot pin as well as the movements in the radial direction which are due to transverse stresses.

The appended drawings show by way of example two forms of motor car door hinges in accordance with the invention.

Fig. 1 is an elevation of a door provided with two hinges having the two respective forms of construction.

Fig. 2 is a vertical section of the upper hinge on the line 2—2 of Fig. 1.

Fig. 3 is a like section of the lower hinge on the line 3—3 of Fig. 1.

Fig. 4 is a section on the line 4—4 of Fig. 1.

As observed in the drawings, the upper hinge consists of a plate 6 which is secured to the vehicle body and is provided with a socket 7, and a plate 8 which is secured to the door 9 and on which is mounted the pivot pin 4. Between the pivot pin 4 and the socket 7 is placed a ring 3 of elastic material, for instance india rubber of the proper degree of elasticity. When mounting the hinge, said ring is strongly compressed between the pivot pin and the socket and is thereby elongated, and the original dimensions of the ring are so selected that at the end of the operation the length of the ring will be substantially the same as that of the socket. The two ends of the ring 3 may be left free, or they may be axially compressed by two plates which are secured to the ends of the socket 7 and give passage to the pivot pin 4.

Due to this initial deformation, the india rubber ring will strongly adhere to the pivot pin and the socket, and when the door is turned the pin 4 will rotate therewith, and this rotation causes a molecular deformation of the india rubber concentrically with the axis, and without any friction between the ring, the pivot pin and the socket. When the door, by reason of its own weight or on account of the movements and deformations of the vehicle body and frame, is displaced with reference to the pin 4, the ring will be still further compressed between the said pin and the socket, without any deformation of the latter. In this event there will be no play or wear, and when the door is closed it will take its position in the rabbet of the vehicle body without effort. The joint is always quite noiseless and requires no oiling.

When the hinge is assembled, the india rubber ring may be given a certain initial torsion about the axis, so that when the hinge is in place, the door under the elastic effect of this initial torsion will naturally tend to open or close according to the direction of this deformation.

In the lower hinge, the plate 6 comprises two end sockets 7 and 7′, and the plate 8 comprises a central socket 8′ and three rings 3 which are similar to the rings of the upper hinge and are originally subjected to deformation in like manner; but they are shorter and are placed respectively between the said sockets and the pivot pin 4 which is not rigidly secured to either of the said plates. The operation is quite the same as for the upper hinge. In this device the three rings 3, or only some of them, may be subjected to initial torsion in the same direction or contrary directions in order that the door will naturally tend to open or close. Instead of three rings I may em-

ploy only two, and herein the pivot pin is supported in an overhung position.

It will be noted that only the upper hinge may be provided with an india rubber ring, since this hinge is the one which is chiefly affected by the deformations of the vehicle body. In the closing position the door may then be held by means of a rib 10 engaging in a corresponding groove in the rabbet of the vehicle body. In this manner the only effect of the motion of the vehicle body will be the radial deformation of the india rubber rings of the hinges, and no stresses will be brought upon the lock.

Obviously, the said invention is not limited to the forms of construction herein described and represented. In particular, in the construction of a hinge I may utilize a device consisting of two concentric tubes separated by the india rubber ring which strongly adheres to each tube, both tubes being provided with means by which they may be secured respectively to the two plates of the hinge. In like manner, I may obtain the adhesion otherwise than by the initial deformation or compression of the india rubber ring, for instance by vulcanizing the said ring or rings upon the pivot pin, the sockets or the tubes.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:

1. A hinge for vehicle doors and the like comprising an inner pivot member and an outer socket member adapted to be connected to the relatively movable parts of the frame and door structure respectively, and a sleeve of elastic material between said inner and outer members said sleeve being considerably reduced in radial thickness and considerably elongated in the axial direction subsequent to its insertion between said members.

2. A hinge as claimed in claim 1, wherein said sleeve is so connected with said inner pivot member and said outer socket member that it possesses an initial torsion whereby the hinge normally tends to work in a predetermined direction.

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

LEON THIRY.