March 9, 1937. H. D. GEYER 2,073,149

AUTOMOBILE DOOR LOCK

Filed Oct. 26, 1933

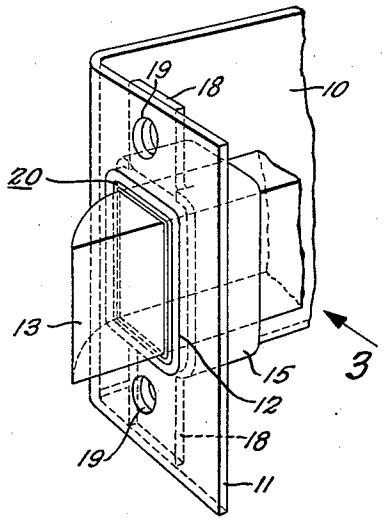


Fig. 1.

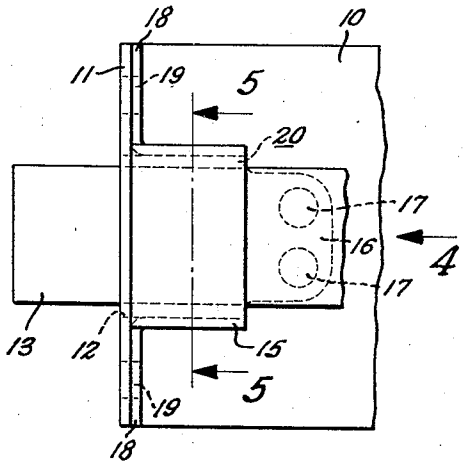


Fig. 3.

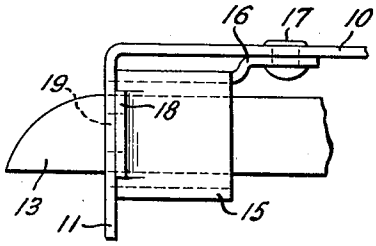


Fig. 2.

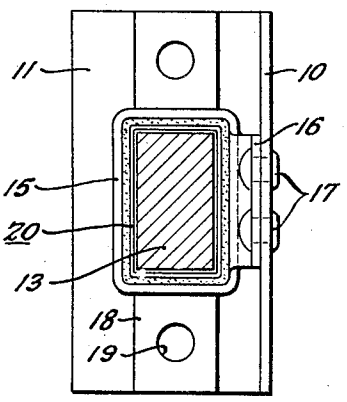


Fig. 4.

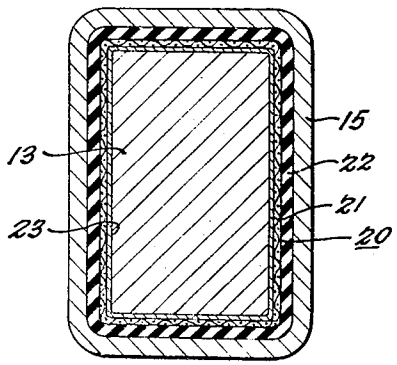


Fig. 5.

INVENTOR
Harvey D. Geyer
BY
Spencer Hardman & Fehn
HIS ATTORNEYS

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AUTOMOBILE DOOR LOCK

Harvey D. Geyer, Dayton, Ohio, assignor, by mesne assignments, to General Motors Corporation, Detroit, Mich., a corporation of Delaware

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3 Claims. (Cl. 292—337)

This invention relates to door locks for doors which are subject to such vibrations and stresses as to cause the locking bolt to rattle or squeak due to relative movement between the bolt and its guide. It is especially designed for automobile doors.

An object of this invention is to eliminate rattles and squeaks caused by wear and relative movement between a sliding bolt and its stationary guide on the lock frame.

A more specific object is to provide a non-metallic self-lubricating cushion lining between the sliding locking bolt and its stationary guide whereby wear between these parts is substantially prevented and whereby vibration rattles and squeaks caused by relative movement between these parts is eliminated. Thus when this invention is applied to an automobile door lock the relative movement between the door and the door jamb caused by the jolting and twisting of the body frame will cause the sliding bolt to move relative to its guide but the cushion lining interposed between the bolt and its guide will prevent rattles, squeaks and wear. All automobile owners know the great tendency to squeaks and rattles due to this cause and so far as known no one heretofore has solved the difficult problem of preventing same. This invention provides a very simple and practical means of preventing such squeaks and rattles.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing, wherein a preferred embodiment of one form of the present invention is clearly shown.

In the drawing:

Fig. 1 is a perspective view of a portion of an automobile door lock embodying this invention.

Fig. 2 is a plan view of the structure of Fig. 1.

Fig. 3 is a side elevation thereof looking in the direction of arrow 3 of Fig. 1.

Fig. 4 is an elevation looking in the direction of arrow 4 of Fig. 3.

Fig. 5 is a section on line 5—5 of Fig. 3.

Similar reference characters refer to similar parts throughout the several views.

Numeral 10 designates an ordinary lock frame of any suitable design and upon which the moving parts of the lock are mounted. This lock frame 10 is suitably fixed to the door by screws or bolts in any suitable and well-known manner. Lock frame 10 has an integral end plate 11 having a rectangular hole 12 therein through which the sliding bolt 13 extends with sufficient clearance as to avoid metal to metal contact therewith. The sliding bolt 13 is actuated from its inner end by any suitable and well-known means and hence it is deemed unnecessary to illustrate such actuating means in the drawing.

A rectangular metal guide tube 15 of substantial length, preferably formed of pressed sheet steel, is rigidly fixed to the lock frame 10 by welding or by rivets. In the form shown, the guide tube 15 has an integral offset tongue 16 riveted to the lock frame 10 by rivets 17 and also upper and lower tongues 18 having holes 19 therein by which tongues 18 may be riveted or screwed to the end plate 11. This guide 15 and its non-metallic anti-friction cushion lining 20 constitutes the novel part of the disclosed structure.

This resilient cushion lining 20 comprises an intermediate layer of fabric 21 faced on one side with a thin cushion layer 22 of resilient rubber or the like, and on the other side with a thin coating 23 of a dry solid lubricating compound, both layers 22 and 23 being bonded to the fabric layer 21 and entering the fibers thereof. This anti-friction coating 23 preferably consists chiefly of a high viscosity cellulose nitrate and very finely divided amorphous graphite mixed therein to form a homogeneous mixture. In making such a hard dry solid anti-friction compound, high viscosity cellulose nitrate having a viscosity of 14 seconds Hercules or higher is dissolved in a suitable solvent, such as acetone, and the finely divided graphite mixed therein, preferably in a proportion of about four to six times as much graphite as dry cellulose nitrate by weight. This compound may be applied evenly to the fabric 21 by spraying or by brush and the solvent permitted to dry, which leaves the hard dry anti-friction coating 23 strongly bonded to the fabric. Preferably the layer 22 of uncured soft rubber compound is applied to one side of the fabric before the above described anti-friction compound is applied to the opposite side. The next step is to compress and mold the coated sheet of fabric between two polished steel plates in a press for about five minutes at a pressure of about 750 lbs. per square inch and at a temperature of about 285° F. This vulcanizes the rubber layer 22 and molds a hard smooth surface on the anti-friction coating 23 and also causes both the rubber layer 22 and lubricant coating 23 to penetrate into the fabric 21 and give a strong bond thereto.

The sheet thus formed is cut up to the proper dimensions and used as a lining in the metal guide tube 15, the rubber layer 22 being cemented or otherwise suitably attached to the inner surface of the tube 15 as clearly shown in Fig. 5.

The bolt 13 fits snugly within the anti-friction lining and bears directly upon the hard dry coating 23, which thus provides very easy sliding to and fro of the bolt 13 without the necessity of any other lubrication for the life of the automobile. The resilient rubber layer 22 provides a suitable resilient cushion between the bolt 13 and the metal guide 15. It is now clear that when an automobile door equipped with this invention moves slightly relative to the door joint due to a jolting or distortion of the body frame, the bolt 13 will be cushioned upon the non-metallic cushion lining 20 and hence no rattles or squeaks between the bolt 13 and its lock frame can occur.

While the form of embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. In a lock adapted for use on automobile doors, a lock frame, a sliding lock bolt, a stationary metal guide for said lock bolt, and a non-metallic cushion lining bonded to said metal guide and isolating said sliding bolt and said metal guide, said lining comprising an intermediate fabric layer, an outer cushion layer of resilient material bonded to said guide, and an inner coating of dry lubricant bonded to said fabric layer.

2. In a lock adapted for use on automobile doors, a lock frame, a sliding lock bolt, a stationary metal guide for said lock bolt, and a non-metallic cushion lining bonded to said metal guide and isolating said sliding bolt and said metal guide, said lining comprising an intermediate fabric layer, an outer cushion layer of resilient rubber, and an inner coating of dry lubricant upon said fabric layer.

3. In a lock adapted for use on automobile doors, a lock frame, a sliding lock bolt, a stationary metal guide for said lock bolt, and a non-metallic cushion lining bonded to said metal guide and isolating said sliding bolt and said metal guide, said lining comprising an outer cushion layer of resilient rubber surface-bonded to said metal guide, and a dry lubricating coating bonded to said rubber layer.

HARVEY D. GEYER.