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DOOR CATCH

Everett W. Allen, Birmingham, Mich., assignor to
General Motors Corporation, Detroit, Mich., a
corporation of Delaware

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6 Claims. (Cl. 292-241)

1

This invention relates to cupboard latches. It deals more particularly with a spring catch which will hold a door tightly against rattles and accidental detachment. Among its objects are to provide a simple low cost structure comprising a minimum number of parts which can be easily and quickly assembled or disassembled if occasion requires. No expensive equipment is needed either to manufacture or install the parts and except for the panels to be latched there are involved only two parts consisting essentially of an outside handle and an inside latch bar. Either or both of such parts can be made of metal, plastic or other suitable material, and shaped to interfit and thereby fix themselves to one another and pivotally mount them in a door or panel.

A preferred embodiment of the invention is illustrated in the accompanying drawing where-in Figure 1 is a front elevation of a portion of a closure door latched in position over an opening in a mounting panel; Fig. 2 is a transverse section taken on line 2-2 but on a larger scale and Figure 3 is a rear elevation as on line 3-3 of Figure 2.

By way of example the drawing shows a pair of sheet metal panels 1 and 2 consisting of a mounting panel having an opening and a closure for the opening with the edges of the two panels overlapping. An exterior handle or knob 3 has a circular boss or disc 4 bearing on the outside face of the closure panel 2 with a squared shaft or shank 5 projecting inwardly through an opening in the panel and having axially spaced from the interior face of the panel a reduced neck portion 6 formed by an annular groove just beyond which the stud terminates in a conical or tapered tip 7. Fitted to the shank 5 is a rocker arm in the form of a double legged spring loop of strip stock having a reverse bend 8 joining a short leg or wing 9 and a long leg or wing 10, both of which are apertured and fitted to the shank, one beside the panel 1 and the other within the groove 6.

In the drawing the long leg 10 has a rearwardly offset end portion afforded by a laterally extending limb 11 and an outwardly inclined latching lip 12, both sides of which are bent back at a slight angle to form skid or approach surfaces. The latching lip 12 upon rocking of the handle 3 is brought into and out of engagement with the back of a raised or rearwardly depressed bulge 13 at the edge of the mounting panel 1. As installed the spring loop is under stress and its legs tend to spring apart so that the lip 12

2

on the long leg 10 exerts an outward force on its seat 13 while the shorter leg 9 pushes inward on the side or radial abutment face of the groove 6. This spring force through the bearing abutment of the handle base 4 keeps the closure door 2 tightly seated on the edge of the panel 1 which is clamped by the spring force between the panel 2 and the latch lip 12.

Inasmuch as all clearance will be taken up there is no likelihood of rattles and the spring force furthermore is sufficient that enough frictional resistance is present between the lip 12 and its seat 13 to resist accidental rotation of the latch parts for disengagement. However, the parts can be easily rotated upon the application of manual force on the handle 3. The pivot bearing is provided by a round hole through the panel 2 of a diameter substantially corresponding to the distance between diagonally opposite corners of the square shank 5. Cocking of the shank is prevented because of the bearing contact on the inner and outer faces of the panel by the abutment disc 4 and the leg 10.

The shank receiving opening through the leg 10 is made square to fit the cross sectional shape of the squared shank and this provides for relative nonrotation of the parts and insures their turning in unison. Both the shank and the opening may, of course, be made of other noncircular formation and optionally both can be circular in the event the bottom of the groove 6 and the opening through the leg 9 are noncircular. On the other hand, the openings in both legs may be noncircular to fit mating noncircular parts of the shank. Furthermore the annular groove 6, if desired, can be replaced by a slot in one side only of the shank, although the annular groove is preferred because it enables the rocker bar and the shaft with its handle 3 to be placed in any selected angular relationship.

It is to be noted that the shank receiving openings in the two legs are axially offset in relation to each other to insure retention of the rocker arm on the shaft. The relation of the parts is such that in the application of the latch parts the aperture in the long leg 10 is first fitted to the shank and then with the aperture of the short leg 9 bearing on the conical tip 7 axially applied pressure on the leg 9 will cause it to ride in on the tapered tip surface and drop or snap into the groove 6. In so doing the loop is contracted and its tendency to expand will cause the shaft 5 to be gripped radially between the two legs 9 and 10. As seen in Figure 2 the edge of the aperture in the leg 10 is in contact with

3

the bottom of the shank while the edge of the aperture in the short leg 9 is in contact with the top of the groove 6. Hopping out of the groove is thus resisted with the groove side wall receiving the expanding thrust of the spring and holding the parts securely in assembled relation.

I claim:

1. A rotatable spring latch of the character described, including a handle having a bearing shoulder to contact the outer face of a panel and a squared shank projecting therefrom through and for rotation in an opening in the panel, said shank terminating in a pointed camming tip and having an annular retaining groove adjacent said camming tip, a J-shaped spring, the longer leg of which is arranged to contact the inner face of said panel with a squared opening to fit non-rotatably the said squared shank for rotation therewith and terminates in an inwardly offset portion releasably engageable upon shank rotation with a cooperating seat on a part with which said panel cooperates and the shorter leg of which spring has an opening normally non-axially related to the first mentioned opening to receive the camming tip end of the shank and enable reception and retention of the shorter leg within said annular groove, with the spring loop under sufficient compression to resist displacement and prevent rattles.

2. In a latch device of the character described, a rocker arm comprising a pair of spaced wings joined by a reverse bend, a rockshaft engaged by both wings and provided near its tip with an annular groove into which one of the wings is sprung to locate the parts axially, the engaged parts of the shaft and at least one of the wings being of mating polygonal shape to locate the rocker arm and shaft against relative rotation but enabling the rocker arm to be fitted to the shaft in selected angular positions.

3. A latching device including a rockshaft having a polygonal shank portion and an annular groove near the shaft tip and terminating in a tapered tip affording a camming surface leading to said annular groove, a latch bar having a pair of spaced legs joined by a reverse bend and provided with openings to receive said shank, one

4

of said openings being polygonal to mate with the shape of the polygonal shank portion, said legs engaging opposite sides of the shaft and gripping the same therebetween under spring tension and the last leg to be fitted to the shaft being arranged to ride on the tapered surface and be cammed into position to snap into said groove.

4. In a device of the character described, a mounting shank having an annular groove near its tip and terminating in a tapered nose leading to said groove, a double leg strip having a reverse bend and being fitted to the shank with opposite sides of the shank gripped between the legs with one of the legs received within said groove after being cammed onto the tapered nose and snapped into the groove.

5. A latching device including a double legged loop having openings in both legs slightly offset from one another and at least one thereof being noncircular, a mounting shank projecting through both openings and by reason of their offset relation setting up a stress in the loop, said shank having a noncircular portion engaged by the noncircular opening, and a radial abutment near its end for one of the legs, said shank terminating in an inclined guide surface for leading the last mentioned leg into engagement behind said abutment.

6. Means to secure together two members, including a shaft having a bearing shoulder on one side of one of the members with a shank projecting through and beyond the other side of the member, said shank terminating in a tapered tip with a radial abutment beside the tip to which the tapered tip surface affords a camming guide-way, a double legged spring loop having its legs fitted under tension to the shank with one leg pressing outwardly of the other leg and toward the said last mentioned side of the member and the other leg pressing outwardly of the first mentioned leg and against said abutment, said loop being rockable about the shank axis to bring one of the legs selectively into or out of latched engagement with the other of said members and when so engaged exerting spring pressure thereagainst.

EVERETT W. ALLEN.