

March 13, 1945.

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2,371,386

LATCH AND KEEPER COMBINATION

Original Filed Sept. 11, 1940

Fig. 1.
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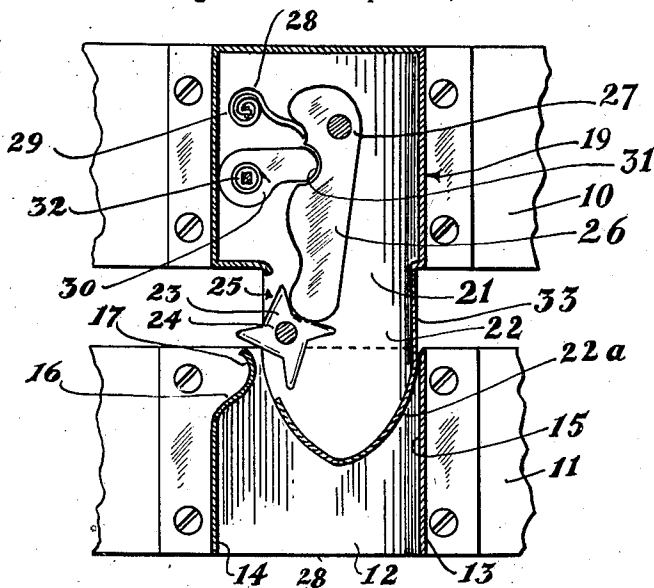


Fig. 2.
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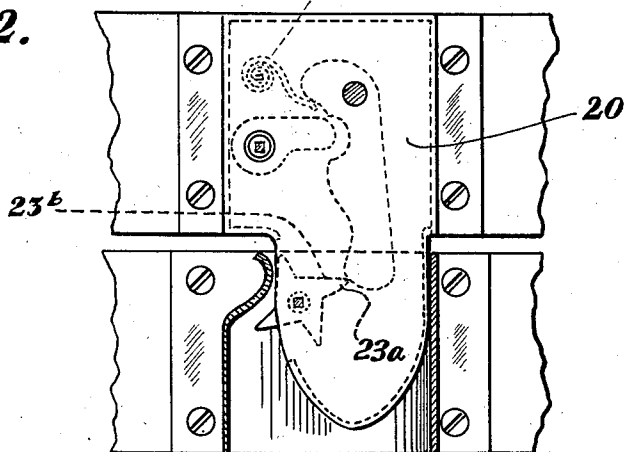
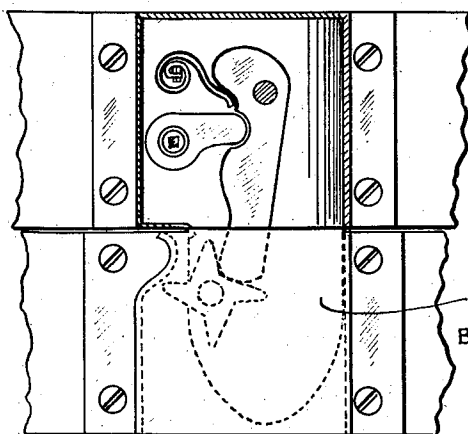


Fig. 3.
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2,371,386

LATCH AND KEEPER COMBINATION

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Application September 11, 1940, Serial No. 356,274,
which is a division of application Serial No.
106,243, October 17, 1936. Divided and this ap-
plication February 8, 1944, Serial No. 521,492

7 Claims. (Cl. 292—214)

This invention pertains generally to latch mechanisms of the rotary or pivoted bolt type in which the bolt element is urged by cam means into latching association with a keeper. The present application is a division of my co-pending application Ser. No. 356,274, filed September 11, 1940, now Patent Number 2,342,848, dated February 29, 1944, on Rotary latch with multiple engaging means, the latter application being a division of an earlier application Ser. No. 106,243, now Patent No. 2,224,512, issued December 10, 1940, on Door latch.

The present latch mechanism is generally adaptable for releasably securing together two relatively movable members, without limitation as to the particular form or environment of such members. The invention has in common with other latch mechanism the general combination of a cam-urged bolt carried by one of said members and engageable with a keeper surface or shoulder on the other member, all in a manner such that the cam means urges the bolt into latched association with the keeper and, until manually released, maintains the bolt in such association.

My primary object is to provide a novel latch mechanism of this type in which the bolt has a dual action and effect in maintaining latched relation between the members not only by reason of the association of the bolt with the keeper engaged by the bolt, but also by virtue of the engagement under the reactive influence of the bolt, between a part carried by the bolt-supporting member with a second keeper or bearing surface on the keeper supporting member. In its preferred form, the invention contemplates a keeper structure or assembly comprising spaced surfaces, one of which may be inclined for engagement by the bolt in its latched position. The bolt and cam means is supported by or contained within a case structure, an outer portion of which is received between the spaced keeper surfaces and in a position to engage the bearing surface opposite the inclined keeper. The case desirably is adapted to engage that bearing surface throughout a range of relative movement starting in advance of bolt rotation to the cam-tripping position. By virtue of the cam-urged thrust of the bolt against its keeper, the case is caused to be tightly pressed against the bearing surface to maintain the case structure against lateral or vibratory movements between the keeper surfaces.

The invention will be understood to better advantage from the following detailed descrip-

tion illustrative of the embodiment shown in the accompanying drawing, and in which:

Fig. 1 is a view showing the parts in unlatched position, parts of the case and keeper appearing in section;

Fig. 2 is a similar view showing the parts at substantially the tripping position of the cam, the case structure appearing in elevation; and

Fig. 3 is a view showing the latched condition of the parts and the keeper structure in elevation.

The latch mechanism is shown to be applied to a pair of members 10 and 11 movable relatively together from the position of Fig. 1 to that of Fig. 3. Attached to member 11 is a keeper structure which may consist of a plate 12 having projecting portions 13 and 14 forming respectively a bearing surface 15 and a bolt engageable keeper. The keeper proper, preferably is inclined at 16 and may be turned reversely at its upper end, as at 17. If desired, the interior of the keeper may be closed by a wall 18, see Fig. 3, spaced from the plate 12 and interconnecting the projections 13 and 14.

Member 10 carries a case structure 19, the interior parts of which may, if desired, be closed by wall or cover 20 spaced from the base plate 21. The case structure includes a projecting portion 22 adapted to be received between the keeper portions 13 and 14 as the members 10 and 11 are brought together. The case projection 22 carries a bolt element, preferably in the form of a multi-headed bolt 23 rotatable on a pin 24 terminating in the case. As illustrated, the case may be opened at 25 to provide clearance for the bolt rotation. The bolt is actuated by suitable cam means shown typically to comprise a cam member 26 pivotally movable inside the case on pin 27, the cam being urged against the bolt by coil spring 28 supported at 29 on the case. The cam may be retracted from holding relation to the bolt by a suitable manually controlled operator, such as an arm 30 engageable at 31 with the cam and carried on spindle 32 to which may be applied a handle, not shown, at the outside of the case.

In considering the operation of the mechanism, assume the parts to be in unlatched position and the curved end 22a of the case projection to have entered the keeper as the members 10 and 11 are brought together, initially to the position of Fig. 1. Preferably the case surface 33 is brought to a position opposite or to a position of engagement with bearing surface 15 of the keeper at or in advance of the engagement of

the bolt 23 with the end portion 17 of the keeper 16. As the case projection is thrust further into the keeper, the bolt is rotated against the resistance of the cam 26 to substantially the cam tripping position shown in Fig. 2, i. e., substantially the position beyond which the cam rides over the end of the bolt head 23a to be urged by spring 28 into wedge engagement with the bolt surface 23b. The cam then rotates and urges the bolt along the inclined keeper 16 to a fully latched position, as shown in Fig. 3. The cam action is such as to impart a strong wedging thrust against the bolt, and the reactive component of that thrust is transmitted to the case projection 22 causing surface 33 to be pressed into tight engagement with the bearing surface 15. As will be apparent, such tight interengagement between the case projection and bearing surface exists at all positions in which the bolt is being urged in a latching direction by the cam. Also it will be further observed that following initial engagement of the bolt with the keeper, the case has a reactive thrust against bearing surface 15 by reason of the resistance to bolt rotation imposed by the cam.

I claim:

1. A latch mechanism for securing together two relatively movable members, comprising a case carried by a first one of said members, a movable bolt supported by said case, cam means for urging said bolt in a latching direction, spaced keeper and bearing surfaces carried by the second of said members and between which said case is movable as said members are brought together, said keeper surface being engageable by the bolt and the bolt being urged by said cam means against the keeper surface in the latched position of the parts, and means forming a surface carried by said first member and urged against said bearing surface in the latched position of the mechanism by virtue of the cammed engagement of the bolt against said keeper surface.

2. A latch mechanism for securing together two relatively movable members, comprising a case carried by a first one of said members, a pivotally movable bolt supported by said case, cam means for urging said bolt in a latching direction, spaced keeper and bearing surfaces carried by the second of said members and between which said case is movable as said members are brought together, said keeper surface being engageable by the bolt and the bolt being urged by said cam means against the keeper surface in the latched position of the parts, and said case being urged against said bearing surface in the latched position of the mechanism by virtue of the cammed engagement of the bolt against said keeper surface.

3. A latch mechanism for securing together two relatively movable members, comprising a case carried by a first one of said members, a pivotally movable bolt supported by said case, cam means for urging said bolt in a latching direction, spaced keeper and bearing surfaces carried by the second of said members and between which said case is movable as said members are brought together, said keeper surface being engageable by the bolt in different relative positions of said members while the bolt is being urged by said cam against said keeper surface, and means forming a surface carried by said first member and urged against said bearing surface at said different relative positions of the

members by virtue of the cammed engagement of the bolt against said keeper surface.

4. A latch mechanism for securing together two relatively movable members, comprising a case carried by a first one of said members, a pivotally movable bolt supported by said case, cam means supported by said case and operable to urge said bolt in a latching direction, spaced keeper and bearing surfaces carried by the second of said members and between which said case is movable as said members are brought together, said keeper surface being inclined and engageable by the bolt in different positions thereof while the bolt is being urged by said cam in a latching direction, and said case being urged against said bearing surface at said different positions of the bolt by virtue of the cammed engagement of the bolt against said keeper surface.

5. A latch mechanism for securing together two relatively movable members, comprising a case carried by a first one of said members, a movable bolt supported by said case, cam means for urging said bolt in a latching direction, spaced keeper and bearing surfaces carried by the second of said members and between which said case is movable as said members are brought together, said keeper surface being engageable by the bolt in different relative positions of said members while the bolt is being urged by said cam against the keeper surface, and said case being urged against said bearing surface at said different relative positions of the members by virtue of the cammed engagement of the bolt against said keeper surface.

6. A latch mechanism for securing together two relatively movable members, comprising a case carried by a first one of said members, a movable bolt supported by said case, spring-pressed cam means for urging said bolt in a latching direction, spaced keeper and bearing surfaces carried by the second of said members and between which said case is movable as said members are brought together, said keeper surface being engageable by the bolt within a first range of bolt movement in which the bolt is displaced against the resistance of said cam means and within a second range of movement in which the cam means acts to urge the bolt against the keeper surface, means forming on said first member a surface that is urged against said bearing surface during both said ranges of bolt movement by virtue of the bolt thrust against said keeper surface.

7. A latch mechanism for securing together two relatively movable members, comprising a case carried by a first one of said members, a multi-headed bolt pivotally supported by said case, case-supported cam means engageable with any of the bolt heads for urging said bolt in a latching direction, spaced keeper and bearing surfaces carried by the second of said members and between which said case is movable as said members are brought together, said keeper surface being inclined and engaged by the bolt within a first range of bolt movement in which the bolt is rotated against the resistance of said cam means and within a second range of movement in which the cam means acts to advance the bolt along the keeper surface, said case being urged against said bearing surface during both said ranges of bolt movement by virtue of the bolt thrust against said keeper surface.