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FLUSH-TYPE DOOR LATCH

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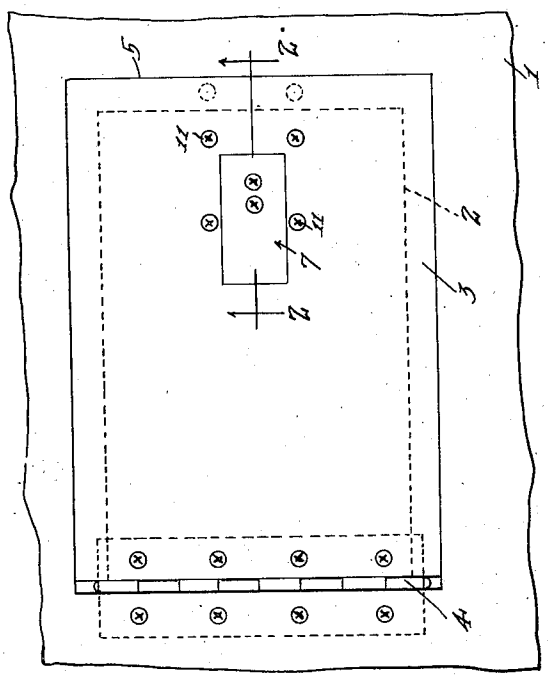


Fig. 1

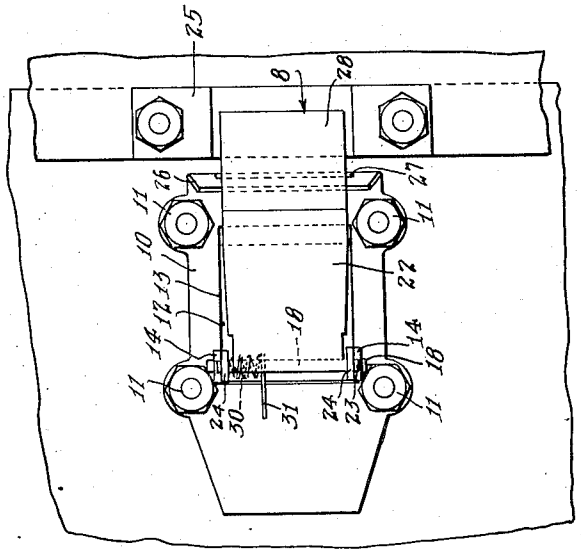


Fig. 3

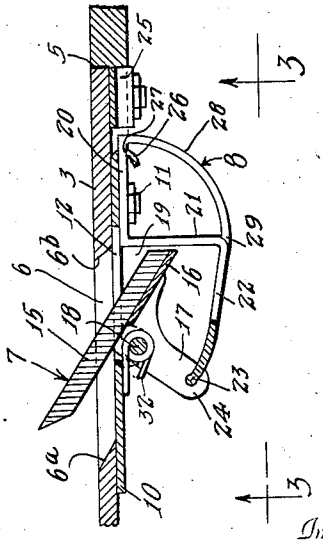


Fig. 2

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FLUSH-TYPE DOOR LATCH

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1

This invention relates to a type of latch or lock popularly called "flush-type" latches or locks; that is to say, it relates to a type of latch in which, although the latch can be operated from the outside of a door or window there is no part for operating the lock that projects outwardly beyond the outer face of the door. Latches of this type are very useful for the doors of airplanes because they do not offer any obstruction to the slip stream on the skin of the ship. They are also useful on automobile doors for the same reason, and for the additional reason that they do not present any outwardly projecting handle that could become caught into one's clothing and possibly cause accidents.

An object of the present invention is to produce a "flush-type" latch which is of very simple construction and inexpensive to manufacture, but which will operate effectively as a latch.

In the preferred embodiment of the invention the door to which the latch is applied is provided with a slot or opening through its wall in the vicinity of the latch, and in this opening the actuator for the latch is located in such a position that its outer face is substantially flush with the outer face of the door.

This actuator is mounted to rock on a substantially vertical pivotal axis, and the rocking movement is initiated by pressure exerted on the end of the actuator that is located toward, or adjacent to, the keeper with which the bolt of the latch cooperates. This rocking movement would naturally project this end of the actuator into the path of the latch bolt and this would interfere with the withdrawing movement of the latch bolt. One of the objects of this invention is to overcome this difficulty and to provide a construction for the actuator and bolt which will enable them to cooperate without the rocking movement of the actuator interfering in any way with the withdrawal movement of the bolt.

Another object of the invention is to produce a latch of this type having very few parts, so that it will be light weight, thereby adapting it particularly for use on airplanes; also to provide such a latch with a bolt having a form which enables it to present a curved, or cam, face of considerable length to strike the keeper and force the bolt back when the door is slammed or moved to its closed position; also to accomplish this

2

without the use of a large amount of metal that would otherwise be necessary and which would increase the weight of the latch.

Further objects of the invention will appear hereinafter.

The invention consists in the novel parts and combinations of parts to be described hereinafter, all of which contribute to produce an efficient flush-type door latch.

A preferred embodiment of the invention is described in the following specifications, while the broad scope of the invention is pointed out in the appended claims.

In the drawing:

Fig. 1 is a side elevation showing a door having a latch constructed in accordance with this invention. In this view the side plating of the airplane is broken away in the vicinity of the door-frame.

Fig. 2 is a horizontal section taken about on the line 2—2 of Fig. 1 upon an enlarged scale and looking upwardly. But this view shows the latch in its open position, that is to say, with the bolt withdrawn so as to permit the door to be swung open.

Fig. 3 is an elevation showing the parts illustrated in Fig. 2 as viewed from the position of the line 3—3 on the inner side of the door, but with the latch bolt in its closed position.

Fig. 1 illustrates the side wall 1 of an airplane provided with a doorway having a door-frame indicated by the dotted outline 2, and provided with a door 3 which may be mounted on a vertical hinge connection 4 at one of the side edges of the doorway. Adjacent the free, or swinging, edge 5 of the door 3 the material of the door is provided with an opening 6, and in this opening the actuator 7 for the bolt 8 of the latch is movably mounted.

The actuator 7 is preferably mounted near its vertical middle axis on a pivot connection so that it can swing on a vertical axis. In the present instance, in order to mount the actuator, I prefer to provide a base-member or base-plate 10 which is attached to the inner face of the door 3 by suitable small bolts 11 which are illustrated in Fig. 3, but some of which are omitted in Fig. 2 for the sake of clearness in the drawing. This base-plate 10 is provided with an opening 12 that is juxtaposed on that portion of the area of the

opening 6 that is located nearest to the free edge 5 of the door; and adjacent each side edge 13 of this opening 12 the base-plate 10 is provided with projecting ears 14 preferably made integral with the base-plate. These ears 14 project inboard in a substantially horizontal direction.

The actuator includes an outer body or filler 15 that fits nicely into the opening 6 and against its beveled end edges 6a and 6b when the latch is in its closed position. This filler is attached to a foot-plate 16 on its inner face. This foot-plate 16 is formed at its edges with means that projects inboard, for enabling attachment to be made to an adjacent portion of the bolt 8.

In the present instance this means consists of two arms 17 that project inboard at the ears 14, and at this point a transverse bolt 18 is provided that pivots these parts together on the pivotal axis already referred to. By projecting these arms 17 in an inboard direction to a considerable distance, I am able to provide a clearance space 19 in the path of the bolt 8, into which the inwardly pressed end of the actuator may move without obstructing the withdrawing movement of the bolt.

In order to provide this clearance space and at the same time to produce a light-weight bolt 8 suited to my purpose, I prefer to construct the bolt 8 of strap metal, bent so as to present a body portion 20 that is guided to slide on the base-plate 10 and a bracket portion including an offset extension 21 that extends inboard.

At its inboard end the extension 21 is bent around to form an attaching arm or "link" 22, the end of which is connected to the ends of the arms 17. In the present instance the side edges of this "link" are provided with integral projecting pintles 23 that project into eyes 24 formed in the ends of the arms, to receive them.

The manner of guiding the body portion 20 of the bolt on the base-plate 10 is somewhat free, that is to say, the bolt is not guided so that it must slide absolutely in a plane alongside of the base-plate 10 but the end of the bolt that cooperates with the keeper 25 of the latch is guided in the vicinity of the keeper. In order to accomplish this I bend the adjacent edge of the base-plate 10 in an inboard direction to form an integral flange 26, formed with a slot 27 through it which is slightly larger in area than the cross section of the body portion 20 of the bolt. In making the bolt, the strap metal that is used to form the bolt is thrust through this guide opening 27 from the side remote from the keeper 25, after which the end of the strap is bent around to form a cam extension carrying the cam face 28.

In the present instance, the cam face 28 is disposed along an arc and the end of the cam extension 29 abuts up against the metal of the offset extension 21. If this latch bolt is made of very light material, this end 29 if desired, could be welded to the adjacent metal of the extension 21 to insure that the cam extension would have sufficient rigidity so that it will not be battered out of position by slamming the door. In this connection, of course, it should be understood that when the bolt is in its extended position and the door is slammed or pushed shut, this cam face 28 will ride on the edge of the keeper 25, thereby withdrawing the bolt sufficiently to permit its nose to pass the keeper; after which the bolt will be brought to its extended position by resilient means associated with the latch in any desired manner. In the present instance this resilient means is in the form of a coil spring

30 disposed around the bolt or shaft 18. One end of this spring is extended in a shank 31 lying against the inboard face of the base-plate 10 and the other end is formed with a hooked shank 32 that engages over the edge of one of the arms 17.

Of course, if desired, the cam face 28 may be a straight inclined face instead of a curved face, as shown.

Attention is called to the advantage of the skeleton form of the bolt illustrated, providing as it does, a relatively long cam face 28 without requiring much weight of metal. It combines lightness with efficiency.

Many other embodiments of this invention may be resorted to without departing from the spirit of the invention.

What I claim is:

1. A flush-type latch comprising: a base plate adapted to be mounted on the inner side of a door, said base plate having integral guide means formed thereon; an actuator plate pivotally secured to said base plate and positioned to close an opening in a door on which the base plate is mounted, there being an accommodation slot in said base plate to pass an end of said actuator plate as said actuator plate is pivoted; and a latch bolt formed of strap material, said bolt including a looped portion having a flat side adapted to ride on said base plate and retained thereon by said guide means, and a cam side adapted for engagement with a keeper to move the bolt as the door is closed; and coacting means extending from said bolt and said actuator and pivotally connected together whereby pivotal movement of said actuator effects a sliding movement of said bolt.

2. In a flush-type door latch: an actuator plate adapted to fit within an opening in a door wall and form a closure therefor; means for pivoting said actuator plate, from a position in the plane of said door wall to an angular position relative thereto, said actuator plate including an arm projecting into said door; a bolt formed of a sheet strip and including a loop portion having a flat side adapted to move along the inner side of said door wall and pass inboard of a keeper positioned adjacent said door, a cam side extending inboard of said flat side for camming co-action with said keeper, and an arm continuing from the inboard extremity of said cam side in spaced relation to the door and pivotally connected to the arm of said actuator plate.

3. A flush-type latch comprising: a base plate of sheet material having a partially rolled end slotted to form a guide means, a central accommodation slot, and means for attaching the base plate to the inner side of a door with said accommodation slot communicating with an opening in said door; an actuator plate adapted to fit the opening in said door and including a pair of arms projecting through said accommodation slot; journal means carried by said base plate for journalling said arms adjacent their root ends, said actuator plate being movable about said journal means from a position closing the opening in said door to an angular position wherein an end of said actuator plate projects through said accommodation slot; a latch bolt formed of strap material, said bolt including a looped portion and a flat side, the flat side being threaded through and guided by the slotted end of said base plate, a cam formed by said looped portion adapted for engagement with a keeper to move the bolt as the door is closed, and an arm con-

tinuing from said cam between the arms of said actuator plate and pivotally connected therebetween for sliding said bolt as said actuator plate is pivoted.

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