Aug. 11, 1964 R. W. SCHMID ETAL 3,144,266

DEADLOCKING LATCH CONSTRUCTION

Filed June 9, 1961 2 Sheets-Sheet 1

Fig. 1.

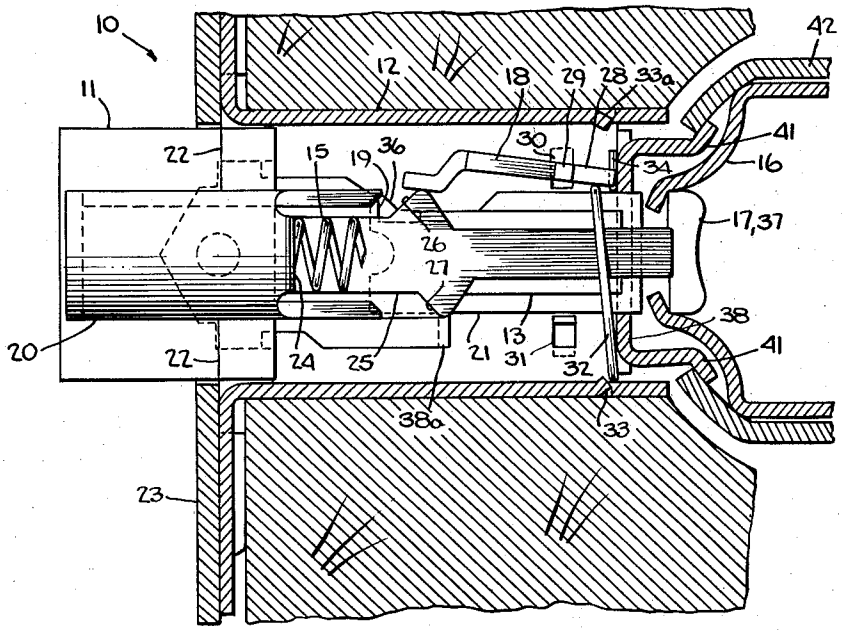
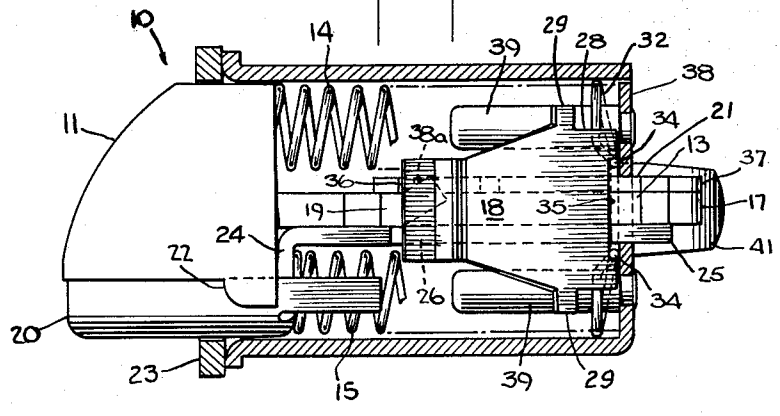


Fig. 2.



INVENTORS
RAYMOND W. SCHMID
RAYMOND WELLS

BY

ATTORNEY

Aug. 11, 1964 R. W. SCHMID ETAL 3,144,266

DEADLOCKING LATCH CONSTRUCTION

Filed June 9, 1961 2 Sheets-Sheet 2

Fig. 3.

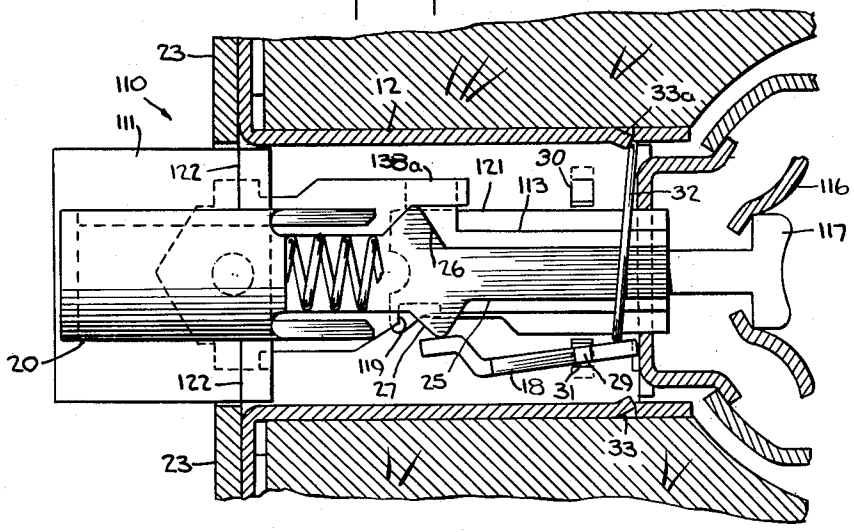
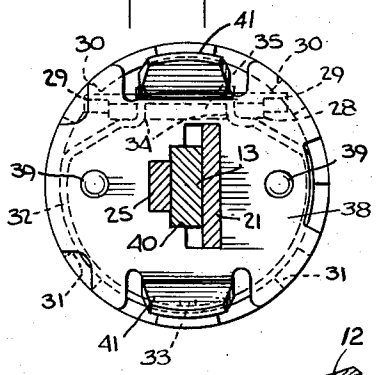


Fig. 4.



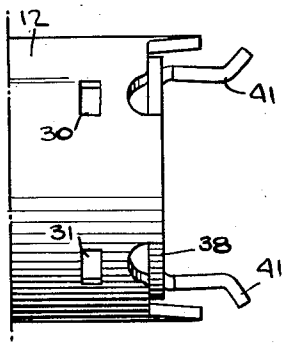
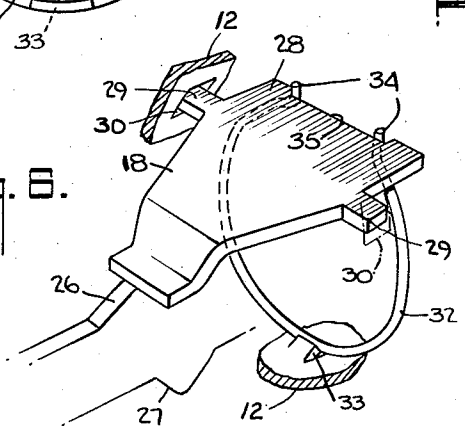


Fig. 5.

Fig. 6.



INVENTORS
RAYMOND W. SCHMID
RAYMOND WELLS

BY

ATTORNEY

United States Patent Office 3,144,266 Patented Aug. 11, 1964

3,144,266

DEADLOCKING LATCH CONSTRUCTION

Raymond W. Schmid, Havertown, and Raymond Wells, Norristown, Pa., assignors, by mesne assignments, to Yale and Towne, Inc., New York, N.Y., a company of Ohio

Filed June 9, 1961, Ser. No. 115,994
5 Claims. (Cl. 292—169)

This invention relates to deadlocking latch bolts for tubular locks.

It will be appreciated that the latch bolts of the particular kind are equipped with mechanism having several parts for controlling the deadlocking operation. Thus, there is present a dog of some description for deadlocking the bolt, and a part that is effective when the door opens to hold the dog in release position. There is also a part whose function is to allow the bolt to be retracted in a normal way when the bolt is engaged with a strike in the closed position of the door.

Those parts, together with the necessary latch tube, springs and possibly further parts, are designed while taking into consideration the throw of the latch bolt, or in other words, the distance the bolt moves between its fully retracted and projected positions. Moreover, different locks may require different throws of latch bolt. Heretofore, that has added to the cost of the locks, because it then was necessary to manufacture an entirely different set of parts for each corresponding throw of the deadlocking bolt mechanism. Our invention relates particularly to a novel deadlocking bolt mechanism having parts that are standardized to a large extent, so that many of the same parts can be used whether the bolt has one throw or another, and reducing the cost of the locks.

The form of our invention that we prefer and that we show in this application utilizes a construction much like that shown in the patent to Golden et al., No. 2,768,014. Thus, there is a trigger bolt that will be depressed by a strike, and that has a tail controlling a deadlocking dog through cam action. In the novel concept of our invention, we utilize cams that are formed in different longitudinal positions on the trigger bolt tail. Each of those cams is designed while taking into consideration a different throw of the latch bolt. Then, by assembling the bolt mechanism in one way or another, the trigger bolt and dog will have that relation which is necessary to operate the dog in the proper way when the latch bolt is designed for a particular throw.

Thus, as an important feature of our invention, we equip a latch bolt mechanism of the class described with a control part that can be used to apply a predetermined control to a deadlocking dog whether the part has one movement or another, due to different throws of the latch bolt. More particularly, we form the control part with cams designed each to effect the proper movement of the deadlocking dog when the latch bolt has a different throw, and each made effective through the assembly of the dog and the control part in a particular relation to each other. As a further part of our invention we utilize novel means for mounting the deadlocking dog for coaction with the control part.

We have thus outlined rather broadly the more important features of our invention in order that the detailed description thereof that follows may be better understood, and in order that out contribution to the art may be better appreciated. There are, of course, additional features of our invention that will be described hereinafter and which will form the subject of the claims appended hereto. Those skilled in the art will appreciate that the conception on which our disclosure is based may readily be utilized as a basis for the designing of other structures for carrying out the several purposes of our invention.

It is important, therefore, that the claims be regarded as including such equivalent constructions as do not depart from the spirit and scope of our invention, in order to prevent the appropriation of our invention by those skilled in the art.

In the drawings,

FIG. 1 shows a vertical section of a latch bolt mechanism utilizing our invention;

FIG. 2 is a horizontal section showing the construction of FIG. 1;

FIG. 3 illustrates how our invention will be used when the latch bolt is designed for a longer throw;

FIG. 4 shows a rear end view of the construction shown in FIG. 1;

FIG. 5 shows a side view of a portion of the latch tube;

FIG. 6 shows a perspective view of parts of our invention.

To illustrate the novel concept of our invention, we show in FIGS. 1 and 2 a bolt mechanism **10** having a construction quite similar to that shown in the patent to Golden et al., to which we already have alluded. We shall describe our invention fully, but it will be well to indicate first that the bolt mechanism **10**, once assembled, will operate like that in the patent. Thus, there is a latch bolt **11** that slides between projected and retracted positions relatively to the latch tube **12**, and that is equipped with a tail **13**. Latch bolt **11** is pressed toward projected position by a pair of coil springs **14**, **15**, FIG. 2, and will be retracted by a bolt retractor **16** that is engaged with a rear end portion **17** on the tail **13**. A spring-pressed dog **18** is adapted to move behind a shoulder **19** on the latch bolt tail **13** to deadlock latch bolt **11** in projected position. To control the deadlocking, there are a trigger bolt **20** and a trigger release **21**. When in a projected position, trigger bolt **20** will hold the dog **18** in release position so that latch bolt **11** can be depressed through engagement with a strike as the door closes. Trigger release **21** will be actuated by the bolt retractor **16**, and will be effective to move the deadlocking dog **18** to release position so that the retractor can retract latch bolt **11**, all as described in the Golden et al. patent.

We shall now describe the bolt mechanism **10** in more particular detail, in order to explain the novel contribution of our invention. The latch bolt **11** has on one side a pair of lugs **22**, FIGS. 1 and 2, that move against a part of a front plate **23** on latch tube **12** so as to determine the projected position of the latch bolt. The throw for which the particular latch bolt **11** is designed will be the distance through which that bolt moves between its projected position and retracted position, as will be understood. The trigger bolt **20** has a transverse portion **24** that may be held by one bolt spring **15** against a rear surface of latch bolt **11**. The trigger bolt **20** then will move with the latch bolt **11**, while the front ends of both bolts are approximately in aligned relation to each other. Naturally, the bolts do not always move together, since trigger bolt **20** may be held depressed by a strike while the bolt spring **14** projects latch bolt **11** to coact with the strike. However, we do call attention to the fact that operation of the trigger bolt **20** will be referred to a position that is determined by the throw of the particular latch bolt **11**.

In our invention, we equip the trigger bolt **20** with a tail **25** having a pair of cams **26**, **27** well shown in FIG. 1, that are formed in different longitudinal positions relatively to trigger bolt **20**. Cam **26** is formed in a particular position on the upper edge of trigger bolt tail **25**, while cam **27** is positioned somewhat farther toward the rear on the lower edge of tail **25**. In FIG. 1, we show the deadlocking dog **18** mounted in a position above the trigger bolt tail **25** so as to coact with the cam **26**. That mounting of the dog **18** will be understood when referring to FIGS. 4 and 6 along with FIG. 1.

Thus, a dog **18** has a relatively wide rear end portion **28** that is formed on its opposed edges with trunnions **29**. A pair of openings **30** are formed in angular relation to each other on an upper part of latch tube **12**, the trunnions **29** being assembled in those openings through a movement of the dog **18** in an upward direction in latch tube **12**. A lower part of the tube **12** has a pair of openings **31** that are like the openings **30**, and to which we shall refer again.

As shown in FIGS. 1, 4 and 6, a curved wire spring **32** is assembled in latch tube **12** with a medial portion of the spring engaged behind a lug **33** on the lower part of the tube. Spring **32** has angular end portions **34** that are held in a notch **35** in the end portions **28** of dog **18**, and that are arranged to press the portion **28** in an upward direction. Thereby the spring **32** holds dog **18** assembled with its trunnions **29** engaged with surfaces of the openings **30**, while the spring pressure also tends to rotate dog **30** to deadlocking position, or in other words, toward the shoulder **19** on latch bolt tail **13**.

Referring to FIGS. 1 and 2, the trigger release **21** is quite like that shown in the Golden et al. patent, being formed with a cam surface **36** for coacting with deadlocking dog **18**, and a rear end portion **37** that is engaged by bolt retractor **16**. For guiding the trigger release **21**, the latch bolt tail **13** has a finger **38***a* that is bent to extend under the lower edge of trigger release **21**. Those persons skilled in the art will understand that bolt retractor **16**, when moving to retract the latch bolt, will also move trigger release **21** to place the dog **18** in release position, if it is not already in that position.

We equip the latch tube **12** with a rear end wall **38** that is formed by bending an integral part of the tube. End wall **38** supports conventional rivets **39**, FIG. 2, that guide the bolt springs **14**, **15**. Also, wall **38** has an opening **40**, FIG. 4, in which slide the bolt tails **13** and **25** and trigger release **21**. The usual angular lugs **41** are formed on end wall **38** to interlock with a casing **42** on which bolt retractor **16** slides. As will be appreciated when considering FIGS. 1 and 2, the end wall **38** is actually arranged at the end of latch tube **12**, with dog **18** and spring **32** positioned forwardly of that wall and entirely within the tube. The particular arrangement makes it possible to utilize the bolt mechanism **10** with a bolt retractor **16** that moves very close to the end wall **38**, as shown in FIG. 1.

Thus far we have referred to the construction that is shown in FIG. 1, and we shall now refer to FIG. 3 in order to explain how standardized parts of our construction may be used for a different lock. In FIG. 3, we show a bolt mechanism **110** in which a latch bolt **111** has a longer throw than does the latch bolt **11** in FIG. 1, latch bolt **111** actually differing somewhat from bolt **11** and having lugs **122** that allow bolt **111** to move farther forward when projected. That mechanism **110** naturally will be used with a bolt retractor **116** that moves a greater distance than does the retractor **16**. It will be remembered from the description we have already made that the movements of the trigger bolt will be referred to the projected position of the latch bolt, yet we use with the latch bolt **111** the same trigger bolt **20** that was used in assembling the construction of FIG. 1. Moreover, we use the same deadlocking dog **18** and spring **32**. To do that, we assemble the dog **18** below the trigger bolt tail **25**, with the trunnions **29** engaged in the lower pair of openings **31** on the latch tube **12**. Then, we assemble spring **32** with its medial portion behind a lug **33***a* on the upper part of latch tube **12**. Dog **18** then will coact with the cam **27** on the lower edge of trigger bolt tail **25**. Since in FIG. 3 the latchbolt **111** and trigger bolt **20** are farther projected, cam **27** now will effect the proper operation of deadlocking dog **18**.

To coact with the deadlocking dog **18** in FIG. 3, the tail **113** on latchbolt **111** has a shoulder **119** that is positioned slightly farther toward the rear as compared to the shoulder **19** in FIG. 1. The guide finger **138***a* naturally will be positioned to coact with the upper edge of trigger release **121**. Also, in FIG. 3 we have chosen to show latch bolt **113** formed with a rear end portion **117** that is relatively long. That enables the latchbolt **111** to be used with locks in which the bolt retractor **116** operates in a position that is farther from the rear end of latch tube **12**. We then use a trigger release **121** that is longer than the trigger release **21**.

Further, in FIG. 3, the latch tube **12** and front plate **23** as well as the dog **18**, trigger bolt **20**, and spring **32**, are the same parts that are used in assembling the construction of FIG. 1.

We believe that it will now be clear that our invention enables us to manufacture deadlocking bolt mechanisms that have different specifications and that are adapted to be used with different locks, while using parts that are standardized to a large extent. Thus, through the concept of our invention we need design merely one latch tube, one trigger bolt, one deadlocking dog, and one deadlocking spring, for assembly in different deadlocking mechanisms that can be used with locks requiring a different throw of the latch bolt. Thereby, it is possible to reduce very considerably the cost of manufacturing the latch bolts. We believe, therefore, that the very considerable value of our invention will be understood and that the merits of our invention will be fully appreciated by those skilled in the art.

We now claim:

1. In a lock of the class described having a latchbolt moving between projected and retracted positions relatively to a latch tube, and a dog movable in said tube for deadlocking said bolt against movement to retracted position, a longitudinally movable control part for controlling said deadlocking dog, said control part moving relatively to a position that is predetermined by the design of the lock for a particular amount of latchbolt throw between retracted and projected positions, dog coacting surfaces having like shape formed in different longitudinal positions on said control part, and means for mounting the deadlocking dog in the latch tube in alternate positions to coact with one of said surfaces so that the same control part may be used to control the dog whether the latch bolt is designed for one throw or another.

2. In a lock of the class described having a latchbolt moving between projected and retracted positions relatively to a latch tube and a dog movable in said tube for deadlocking the bolt against movement to retracted position, a trigger bolt movable longitudinally and having a tail for controlling said deadocking dog, said trigger bolt moving relatively to a position that is predetermined by the design of the lock for a particular amount of latchbolt throw between retracted and projected positions, like cams formed in different longitudinal positions on said trigger bolt tail and adapted each for coaction with the deadlocking dog, and means for assembling said dog in said latch tube in positions to coact selectively with one of the trigger bolt cams, so that the same tirigger bolt may be assembled in the tube to control the dog whether the latchbolt is designed for one throw or another.

3. In a lock of the class described having a latchbolt moving between projected and retracted positions relatively to a latch tube, and a dog movable in said tube for deadlocking the bolt against movement to retracted position, a trigger bolt movable longitudinally and having a tail for controlling said deadlocking dog, said trigger bolt moving relatively to a position that is predetermined by the design of the latchbolt for a particular amount of throw between retracted and projected positions, a pair of cams formed in different longitudinal positions on upper and lower sides of said trigger bolt tail and adapted each for coaction with the deadlocking dog, and means for assembling said dog in positions selectively above or below the trigger bolt tail in the latch tube, whereby one of said cams may control said dog and the same trigger bolt may be assembled in the tube to control the dog

whether the latchbolt is designed for one throw or another.

4. In a lock of the class described, a dog for deadlocking a latchbolt, a trigger bolt for controlling the position of the deadlocking dog, said trigger bolt including a head and a tail extending longitudinally from said head, a pair of cams formed each in a different longitudinal position on the tail of the trigger bolt, and a surface on each of the cams on the trigger bolt tail for coacting with the deadlocking dog when the dog and trigger bolt are in a particular relation to one another.

5. In a lock of the class described having a longitudinally moving latchbolt, a dog for locking said latchbolt, and a longitudinally movable trigger bolt, said trigger bolt including a tail for controlling the locking dog, the improvement that comprises a pair of cams formed in different longitudinal positions on the tail of the trigger bolt, and a surface on each of said cams for coacting with the locking dog, each of said cam surfaces enabling the trigger bolt to control the dog when said bolt and dog are in a particular relation to one another.

References Cited in the file of this patent

UNITED STATES PATENTS

601,371	Czeiler	Mar. 29, 1898
1,876,081	Schlage	Sept. 6, 1932
2,768,014	Golden et al.	Oct. 23, 1956