

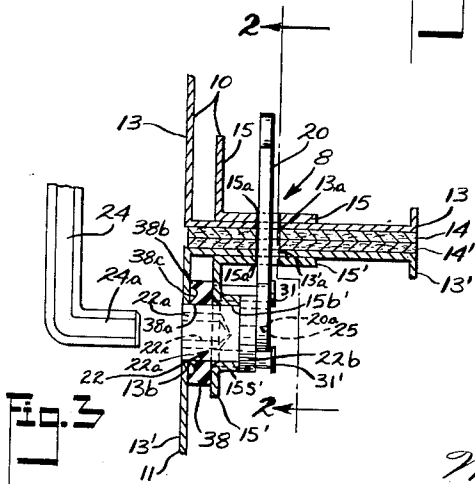
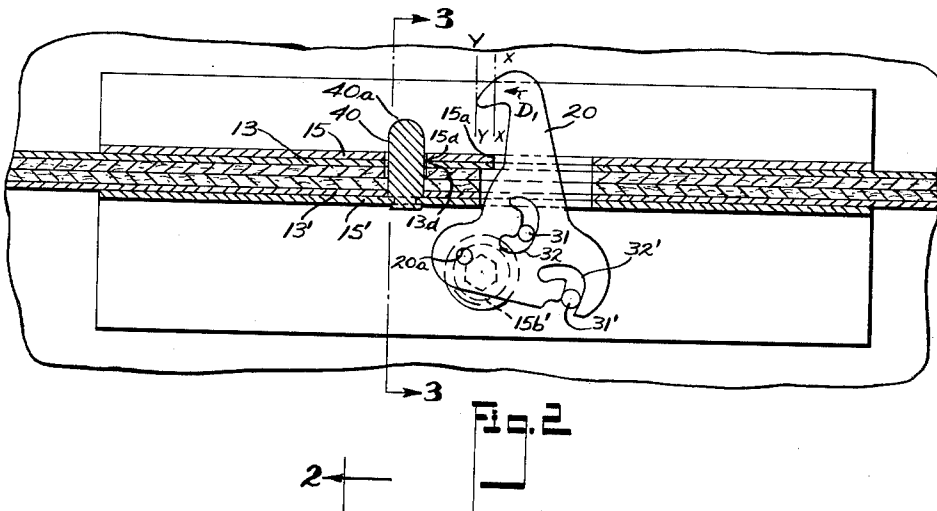
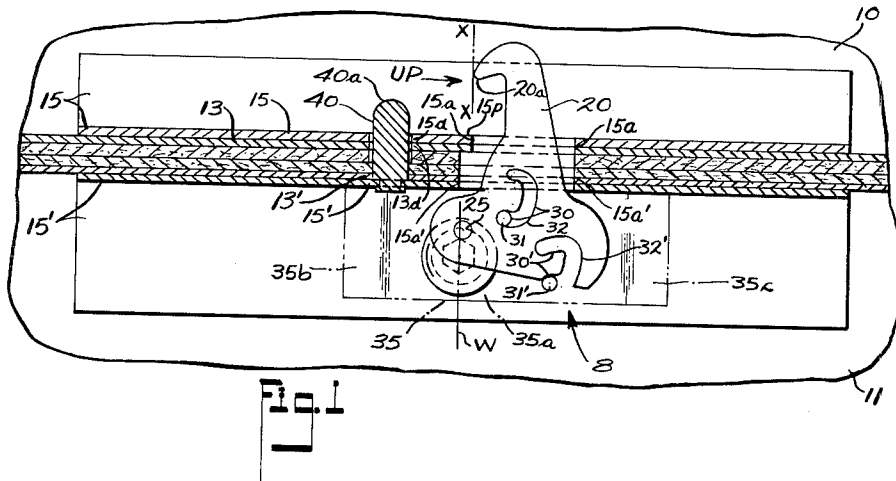
Aug. 7, 1962

L. DE MARCO
CATCH CONSTRUCTION

3,048,435

Filed Sept. 4, 1959

2 Sheets-Sheet 1



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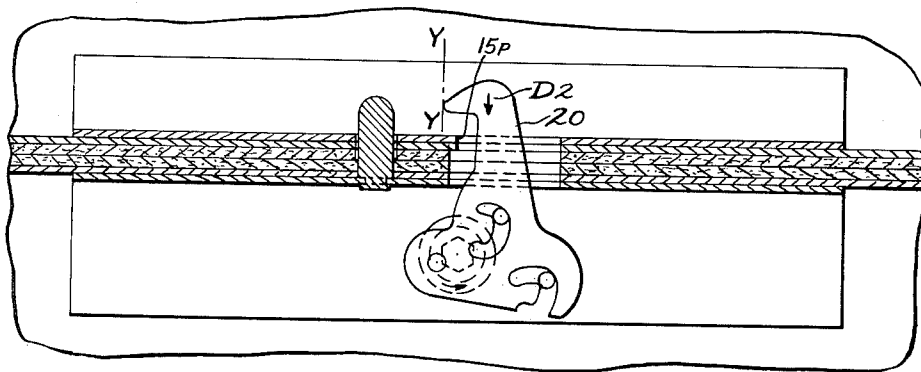


Fig. 4

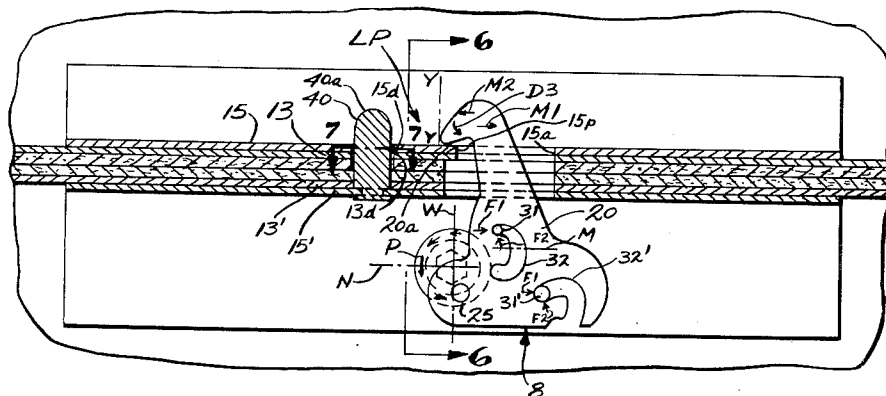
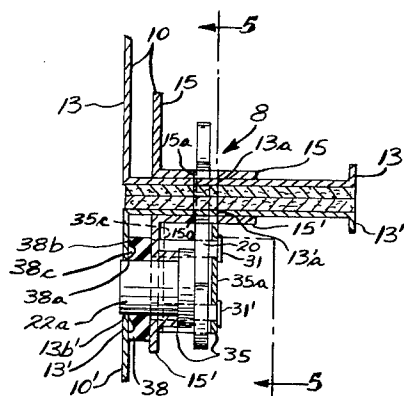


Fig. 5



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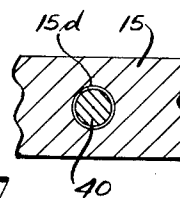


Fig. 7

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3,048,435

CATCH CONSTRUCTION

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5 Claims. (Cl. 292-111)

This invention relates to improvements in a catch construction.

One of the objects of the present invention is to provide a catch construction having a self-locking force applied in the latching position.

A further object of the present invention is to provide a key-operated catch construction.

A further object of the present invention is to provide a catch construction with a latch having movement controlled by an eccentric and a latch movement guide means including one or more guide structures with each having a coacting pin element and slot element.

A further object of the present invention is to provide a catch construction characterized by its economy of manufacture, ease of assembly of its component parts, structural simplicity, strong and sturdy nature, ease of use, multiplicity of functional advantages for some component parts, and many advantageous operational features.

Other features of this invention reside in the arrangement and design of the parts for carrying out their appropriate functions.

Other objects and advantages of this invention will be apparent from the accompanying drawings and description and the essential features will be set forth in the appended claims.

In the drawings,

FIG. 1 is a vertical sectional view through the catch construction with the latch in unlatching position and with the cover plate removed but shown in dot-dash lines;

FIG. 2 is a vertical sectional view, similar to FIG. 1, taken along the line 2—2 in FIG. 3, with the latch moved a portion of the distance from unlatching to latching positions;

FIG. 3 is a vertical sectional view taken along the line 3—3 in FIG. 2;

FIG. 4 is a vertical sectional view through the catch construction showing the latch moved beyond the FIG. 2 position toward the latching position;

FIG. 5 is a vertical sectional view taken along line 5—5 in FIG. 6 through the catch construction showing the latch in the latching position;

FIG. 6 is a vertical sectional view taken along the line 6—6 in FIG. 5 and through the cover plate; while

FIG. 7 is a horizontal sectional view taken along line 7—7 in FIG. 5.

Before the catch construction here illustrated is specifically described, it is to be understood that the invention here involved is not limited to the structural details or arrangement of parts here shown since the catch construction embodying the present invention may take various forms. It also is to be understood that the phraseology or terminology herein employed is for purposes of description and not of limitation since the scope of the present invention is denoted by the appended claims.

While the present invention might be adapted to various types of uses, it has been chosen to show the same as a catch construction 8 detachably connecting separable wall portions 10 and 11 in FIG. 3. These wall portions may be a lid and cooperating wall of a casket or other closable container wherein the wall portions are movable between open and closed relationships. The wall portions 10, 11 are only shown in closed or abutting rela-

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tionship but it should be readily apparent that they can be separated into the open relationship with a gap therebetween by a suitable hinge construction, such as found in a casket.

Upper or lid wall portion 10 includes in FIGS. 1 and 3 an outer lid wall 13 of the casket or container, a sponge rubber strip 14 secured to the lower surface of this wall 13, and an L-shaped plate 15 welded or otherwise secured to wall 13.

Bottom wall portion 11 has an outer box wall 13', sponge rubber strip 14' and L-shaped plate or mounting portion 15' associated together in the same manner as the same named components of upper wall portion 10 without the primed suffixes.

L-plates 15 and 15' are preferably manufactured with the catch construction and separately from the remainder of the casket so that assembly of catch 8 with the casket is effected by welding these plates 15 and 15' to walls 13 and 13' respectively. However, it should be understood that they may be integrally carried by their associated wall portions 10 and 11 instead of welded thereto, if so desired. When wall portions 10 and 11 are in the closed relationship shown in the drawings, slots 15a and 15a' in plates 15 and 15' and slots 13a and 13a' in plates 13 and 13' are aligned as illustrated.

Plate 15' has an integral sleeve 15s' extending to the right in FIG. 3 from the vertical flange of plate 15, and has a bore 15b' in this sleeve 15s' coaxial with bore 13b' in wall 13.

Catch construction 8 includes latch 20 extending through aligned slots 13a, 13a', 15a, and 15a', and movable between unlatching position UP in FIG. 1 and latching position LP in FIG. 5 and in the reverse direction. Latch 20 has a hook-like engaging portion 20a engageable with the flat upper horizontal surface of plate 15 on a hook engager or keeper portion 15p thereof, as shown in FIG. 5, so as to hold in latching position LP in FIG. 5 wall portions 10 and 11 in the illustrated closed relationship.

A suitable latch controller member is rotatably mounted in bore 15b' and is adapted to move latch 20 between positions LP and UP. Controller member 22 includes in FIG. 3 sleeve 22a rotatably mounted in bores 13b' and 15b' and having end plate 22b welded to sleeve 22a and closing the inner end thereof. Sleeve 22a has a key socket 22c, such as an Allen screw hex socket, providing a female portion to receive a key, such as the hex end 24a of Allen head screw key 24 in FIG. 3, for key-operated operation of latch 20 between unlatching position UP and latching position LP.

A comparison of FIGS. 1, 2, 4 and 5 of the drawings reveals that the connecting means operatively connecting latch 20, controller member 22, and wall portion or plate 15' causes, by key-operated clockwise rotation of controller member 22 in FIGS. 1 to 5, sequential movement of hook-like engaging portion 20a from unlatching position UP in FIG. 1 to latching position LP in FIG. 5. This action takes place by movement of portion 20a in generally sidewise direction D1 (horizontally in leftward direction) from FIG. 1 to FIG. 2 from line X—X to line Y—Y relative to hook engager 15p; then movement of portion 20a in generally approach direction D2 (vertical downward direction) in FIG. 4 to an approach position between FIGS. 4 and 5. Then, portion 20a moves in generally direction D3 into latching position LP in FIG. 5 consummated by a self-locking force in this latching position LP adapted to be applied to hook engager 15p by hook-like engaging portion 20a so as to hold the latch in the latching position LP and to pull wall portions 10 and 11 into their closed relationship. Note that latch 20 maintains generally the same angular orientation (inclination with respect to a horizontal line in drawing FIGS. 1,

2 and 4) to mounting portion or plate 15' in FIGS. 1, 2 and 4 during movement between unlatching position UP and the approach position between the FIGS. 4 and 5 positions. Then, in response to the movement of latch 20 between this approach position and latching position LP in FIG. 5, the angular orientation (inclination to the horizontal in the drawings) of latch 20 changes so as to tip the hook-like engaging portion 20a of latch 20 toward hook-engager 15p in the direction D3 in latching position LP in FIG. 5.

Unlatching by movement from latching position LP in FIG. 5 to unlatching position UP in FIG. 1 requires exactly the reverse of these movements and in the reverse order.

The aforementioned connecting means includes an eccentric pivotally connecting the controller member 22 and latch 20 as shown herein. This eccentric is shown in FIGS. 1-3 as a pin 25 secured in a hole in end plate 22b and rotatably mounted in hole 20a in latch 20.

Controller member 22, sleeve 22a, socket 22c, end plate 22b and pin 25 are preferably formed integrally from a single piece of metal by a header operation instead of being assembled separate components.

The aforesaid connecting means also includes a latch movement guide means operatively connecting latch 20 and plate 15' a spaced lateral distance away from controller member 22. This guide means includes two guide structures 30 and 30' with each of these guide structures including respectively a coaxing pin element 31 or 31' and slot element 32 or 32' with one of these elements (here shown as slot elements 32 or 32') being carried by or formed in latch 20 and the other of the elements (here shown as pin element 31 or 31') being carried by mounting portion or plate 15' secured in suitable holes thereof. Each of these pins 31 or 31' has a head at its right end in FIG. 6; extends through aligned holes in plate 35, slot 30 or 30' and a hole in plate 15'; and has its left end peened over on the left side of plate 15'. Each slot element 32 or 32' is generally a C-shaped slot element, as defined by the path of the relative sliding movement of the pin element therein.

Cover plate 35 has been removed in most drawing figures for clarity. This plate 35 in FIGS. 1 and 6 holds latch 20 in assembled position and has holes for pins 31 and 31'. Plate 35 is generally U-shaped in horizontal section with U-cross bar 35a spaced from the vertical portion of plate 15' and has flanges 35b and 35c outwardly directed from opposite outer ends of the two U-arms, extending parallel to portion 35a, and welded to the vertical portion of plate 15'.

Entry of foreign matter, such as dirt or fluid (water or air), is prevented by an annular sealing ring 38 in FIG. 6 made of rubber or other resilient material. Ring 38 surrounds sleeve 22a, is sandwiched between the vertical portions of wall 13' and plate 15', and has in its left face thin inner and thick outer annular lips 38a and 38b with an annular recess 38c between. During assembly of catch 8 with wall 13', plate 15' and controller sleeve 22a are moved vertically in FIG. 6 until latch 20 is in aligned slots 13a, 13a', 15a and 15a'; and are then moved horizontally toward the left to enter sleeve 22a into bore 13b'. During this horizontal movement, lips 38a and 38b engage the right vertical face of wall 13' around bore 13b', inner lip 38a is pushed inwardly to provide sealing around sleeve 22a at bore 13b', and recess 38c permits seal 38 to properly act and to adapt to wall 13' even though the horizontal distance between vertical portions of walls 13' and 15' may vary considerably by a large manufacturing tolerance.

Consistent and accurate alignment of walls 13 and 13' is desired in the closed relationship shown in FIGS. 1-7 so that catch 8 will properly operate. Locating pin element 40 is secured at its lower end in FIG. 5 to plate 15' by a shoulder and peened over end; telescopes in FIGS. 5 and 7 with aligned bore elements 13d and 15d in hori-

zontal portions of wall 13 and plate 15; and has a semi-spherical upper end 40a to guide and pull walls 13 and 13' into alignment during their movement into the closed relationship. Pin 40 eliminates misalignment by distortion in or inaccurate assembly of walls 13 and 13' or plates 15 and 15'; or by play in the hinges connecting walls 13 and 13', whether the play be axially or transversely of the hinge axis in a plane transverse to the longitudinal axis of pin 40. If alignment were not maintained, such as by use of pin 40 if use of pin 40 is found necessary, the catch may not properly function because: (1) position LP in FIG. 5 might not lock walls 13 and 13' together because portion 20a may not engage portion 15p but be located within slot 15a so that portion 20a does not lock against plate 15, or (2) one or more walls of slot 13a or 15a may bind or abut against latch 20 to prevent latch movement between positions UP and LP.

Many other mechanical and structural relationships are evident from the drawings.

In unlatching position UP in FIG. 1, pins 31 and 31' engage against the left lower ends of slots 32 and 32' to establish this position and prevent further clockwise movement of eccentric pin 25.

It should be noted that eccentric pin 25, as it is carried by controller member 22 between unlatching position UP in FIG. 1 and latching position LP in FIG. 5, is rotatable through an arc of at least 180°, and preferably greater than 180° as shown in the drawings, along the arcuate counterclockwise path P shown by the arrows in FIG. 5 from one overcenter position to another overcenter position with respect to diameter W in FIGS. 1 and 5.

The dot-dash line of symmetry N in FIG. 5 of this path P and the dot-dash line of symmetry M of C-shaped slot 32 extend generally horizontal, generally parallel, or in the same direction.

Each pin element 31 or 31' controls a portion of the path of movement of latch 20. Pin element 31 controls the portion of the movement generally between the position shown in FIGS. 1, 2 and 4. Then, pin element 31' controls the remaining portion of the movement generally between the positions shown in FIGS. 4 and 5. During the time of control, the controlling pin element travels in a slot portion shaped to prevent free pivotal movement of latch 20 about pivot pin 25. Pin elements 31 and 31' do not exert positive control movement on latch 20 between the other positions because: (1) latch 20 would be generally free to pivot on pin 25 counterclockwise away from pin 31' in FIGS. 1 and 2 if pin 31 were not used; (2) latch 20 would be generally free to pivot about pin 25 between FIG. 2 and FIG. 4 positions if pin 31 were not used because the portion of slot 32' occupied by pin 31' forms generally an arc centered on pin 25, and (3) latch 20 would be generally free to pivot about pin 25 within a limited arc between FIG. 4 position and a position immediately before the FIG. 5 position if pin 31' were not used because the portion of slot 32 then occupied by pin 31 forms generally an arc centered on pin 25.

It should be noted that as eccentric pin 25 moves from the FIG. 4 to the FIG. 5 position, pin 25 moves overcenter (the vertical diameter W in FIGS. 1 and 5 of controller member 22). At that time pin 25 pulls downwardly on latch 20 so that portions 15p and 20a engage as a pivot so that latch 20 exerts by hook-like engaging portion 20a the aforescribed self-locking force down on hook engager 15p. Latch 20 generally pivots on its portion 20a during approach to the FIG. 5 position because then each portion (the portion of the path followed by pin 25, the portion of slot 32 moving over pin 31, and the portion of slot 32' moving over pin 31') approximately forms an arc with a radius of curvature extending from this arc toward portion 20a. Therefore, latch 20 is caused to move by pins 25, 31 and 31' so as to approximately pivot on its portion 20a. After this overcenter travel takes place, pin element 31' engages the left end

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of slot 32' in the latching position in FIG. 5 as a stop means for stopping further travel past the overcenter position. Then, latch 20 firmly engages and pulls down upper surface portion 15p of plate 15 so as to pull wall portions 10, 11 together into their closed relationship by the self-locking force exerted in latching position LP in FIG. 5.

Latch 20 firmly holds wall portions 10 and 11 together in latching position LP in FIG. 5. Any attempt to tamper with the catch construction will be resisted. If latch 20 is pushed horizontally to the right in movement direction M1 in FIG. 5, latch 20 exerts forces F1 on pins 31 and 31' to resist this movement tendency. If latch 20 is pushed in movement direction M2 to swing about pivot pin 25 in FIG. 5, forces F2 are exerted in FIG. 5 by latch 20 against pins 31 and 31'. Then, sides of slots 32 and 32' engage the respective pins to resist this force. The upward force exerted on latch portion 20a by plate portion 15a will not cause continued counterclockwise rotation of controller 22 and pin 25 in FIG. 5 because pins 31 and 31' engage the left ends of their respective slots in FIG. 5. Therefore, latch 20 will remain firmly held in the latching position LP in FIG. 5.

Slot 15a' and cover plate portion 35a laterally guide latch 20 during movement between positions UP and LP.

Since latch 20 tilts with respect to the horizontal during movement between positions UP and LP (compare FIGS. 1 and 5), the distance in the plane of the drawings between the opposite ends of slot 32 or 32' is less than the distance across path P along vertical diameter W.

Various changes in details and arrangement of parts can be made by one skilled in the art without departing from either the spirit of this invention or the scope of the appended claims.

What is claimed is:

1. A catch construction adapted to detachably connect separable wall portions movable between open and closed relationships, comprising a mounting portion adapted to be carried by one of said wall portions, a latch movable between latching and unlatching positions and having a hook-like engaging portion engageable with a hook engager on the other of said wall portions to hold said wall portions in said closed relationship in said latching position, a latch controller member for moving said latch between said positions, an eccentric pivotally connecting said controller member and latch, and latch movement guide means operatively connecting said latch and mounting portion spaced from said controller member, said guide means including two guide structures; each guide structure including a coaxing pin element and slot element, one of said elements being carried by said latch and the other of said elements being carried by said mounting portion, one pin element controlling one portion and the other pin element controlling the remaining portion of the path of latch movement between said positions.

2. A catch construction adapted to detachably connect separable wall portions movable between open and closed relationships, comprising a mounting portion adapted to be carried by one of said wall portions, a latch movable between latching and unlatching positions and having a hook-like engaging portion engageable with a hook engager on the other of said wall portions to hold said wall portions in said closed relationship in said latching position, a latch controller member for moving said latch between said positions, an eccentric pivotally connecting said controller member and latch, and latch movement guide means operatively connecting said latch and mounting portion spaced from said controller member, said guide means including two guide structures; each guide structure including a coaxing pin element and slot element, one of said elements being carried by said latch and the other of said elements being carried by said mounting portion, one pin element controlling one portion and the other pin element controlling

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the remaining portion of the path of latch movement between said positions, said eccentric rotatable from one overcenter to another overcenter position through an arcuate path of at least 180° between latching and unlatching positions, each of said slot elements being a C-shaped slot in said latch, the distance between opposite ends of each C-shaped slot being less than the distance across said arcuate path, said pin elements being fixed to said mounting portion and having relative sliding movement in said associated slots during latch movement between said positions, the line of symmetry of one of said C-shaped slots and the line of symmetry of said arcuate path extending in the same direction, said mounting portion having a slot for laterally guiding said latch during movement between said positions, wall alignment elements carried one by each wall portion and telescopically engaging in said closed relationship to align said wall portion for proper catch operation, and a resilient sealing ring surrounding said latch controller member and located between said one wall portion and said mounting portion for sealing against entry of foreign matter.

3. A catch construction adapted to detachably connect separable wall portions movable between open and closed relationships, comprising a mounting portion adapted to be carried by one of said wall portions, a latch carried by said mounting portion and movable between latching and unlatching positions and having an engaging portion engageable with a keeper on the other of said wall portions to hold said wall portions in said closed relationship in said latching position, a latch controller member on said mounting portion including an eccentric for moving said latch between latch positions said eccentric pivotally connecting said latch and said controller member, means for moving said latch from its unlatched position first in a direction generally at right angles to closing movement of said wall portions and second in the direction of said closing movement, said means including pin means fixed in said mounting portion and slot means in said latch having surface means engaging said pin means for controlling said movements of said latch, said second movement of said latch by said eccentric clamping said latch engaging portion on said keeper at a point of contact and the second movement including movement of said eccentric to a position where a line through said point of contact and the eccentric connection of said latch is carried over the center of said eccentric whereby an accidental separating force on said wall portions cannot release the clamping action of said latch.

4. A catch construction as defined in claim 3 in which said slot means includes a first cam portion that engages said pin means when the latch is first moved from its unlatching position towards its latching position in said first direction, said first cam portion having a generally right angular configuration.

5. A catch construction adapted to detachably connect separable wall portions movable between open and closed relationships, comprising a mounting portion adapted to be carried by one of said wall portions, a latch movable between latching and unlatching positions and having an engaging portion engageable with an engager on the other of said wall portions to hold said wall portions in said closed relationship in said latching position, a latch controller member for moving said latch between said positions, an eccentric pivotally connecting said controller member and latch, and latch movement guide means operatively connecting said latch and mounting portion spaced from said controller member, said guide members including a pair of coaxing pins and slots for guiding the movement of the latch, the first slot of said pair of coaxing pins and slots having a cam surface for controlling a portion of the movement of the latch and the second slot having a cam surface for controlling the last portion of movement of the latch just

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before it is locked in its latched position, said latch touching said mounting plate and pivoting about its plate engaging end during the last portion of its movement to wedge the plate engaging end tightly against said plate, the movement of the second slot relative to its coacting pin during the last movement of the latch before locking being greater than the movement of the first slot relative to its coacting pin.

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