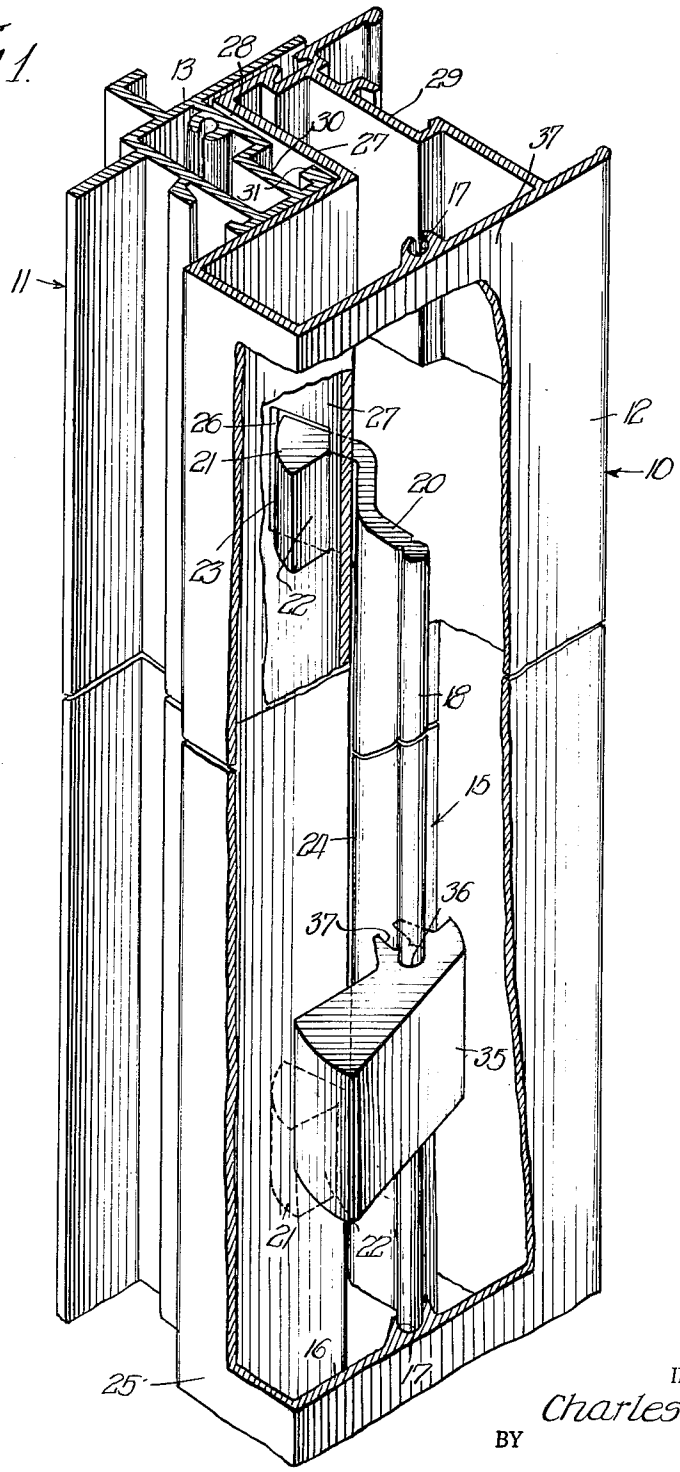
Nov. 30, 1965 C. M. MILLER 3,220,759

LATCH ASSEMBLY

Filed Dec. 18, 1963 2 Sheets-Sheet 1

Fig. 1.



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LATCH ASSEMBLY

Filed Dec. 18, 1963 2 Sheets-Sheet 2

Fig. 3

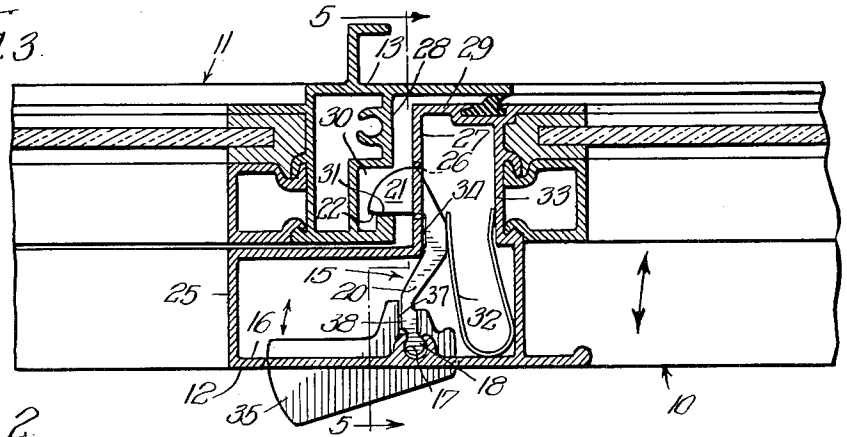


Fig. 2

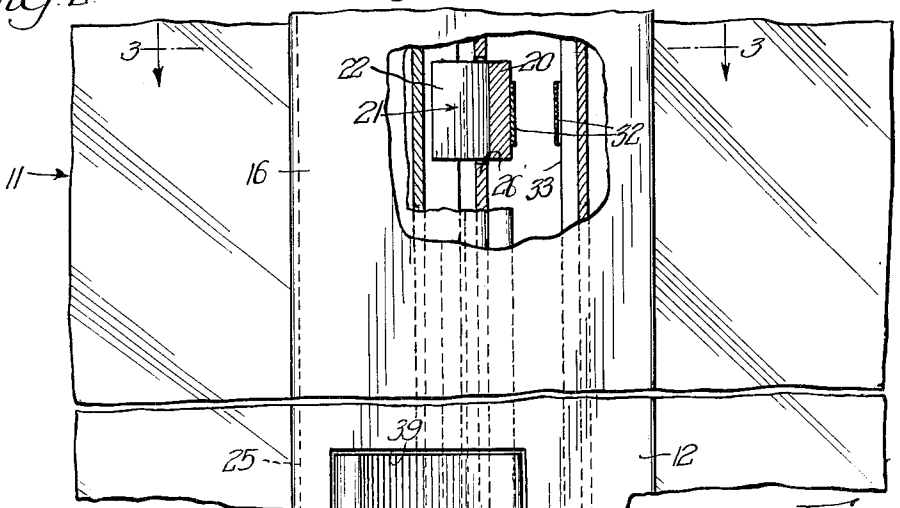
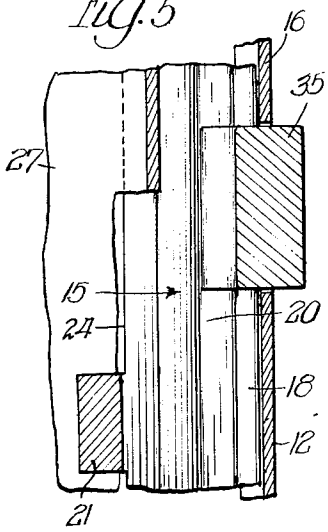


Fig. 5



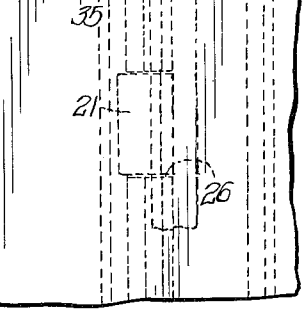
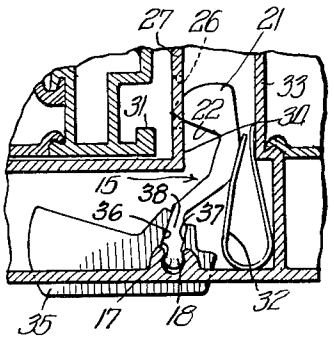


Fig. 4



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3,220,759

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LATCH ASSEMBLY

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Filed Dec. 18, 1963, Ser. No. 331,447
9 Claims. (Cl. 292—120)

This invention relates to hardware for securing closure members in closed position and is more particularly concerned with improvements in a latch assembly for a hinged or sliding window, door or similar closure member.

It is a general object of the invention to provide an improved latch assembly which is adapted to provide a releasable connection between two relatively movable frame members or the like with the latch assembly being associated with one of the frame members and being adapted to engage a keeper forming portion or member on the co-operating frame member.

It is a more specific object of the invention to provide a latch assembly for holding in fixed relation two relatively movable frame members wherein one or more latch tongues are integrally mounted on an elongate latch plate, with the latter having a pivot forming rib extending along an edge opposite the latch tongues for mounting the plate in a bearing support and an operating arm member adapted to be attached to the pivot edge for pivoting the latch plate against the force of a spring which normally urges the latch plate into keeper engaging position to disengage the latch.

It is another object of the invention to provide a latch assembly wherein a plurality of latch tongues are mounted in spaced relation along one edge of a relatively narrow, elongate latch plate having a pivot forming rib on its opposite edge which is adapted to be rotatably seated in a bearing forming support and to receive in adjustable sliding relation thereon an operating arm member which extends radially of the longitudinal axis of the pivot rib and which is adapted to be manually swung to pivot the latch plate out of keeper engaging position against the force of a spring which normally urges the latch plate into locking position.

These and other objects and advantages of the invention will be apparent from a consideration of the latch mechanism which is shown by way of illustration in the accompanying drawings wherein:

FIGURE 1 is a perspective view of portions of a pair of window frame member in closed position and held by a latch assembly which incorporates the principal features of the invention, portions of the frame sections being broken away to better show the latch assembly;

FIGURE 2 is an elevational view with portions broken away showing the latch assembly mounted in the window frame sections;

FIGURE 3 is a transverse section taken on the line 3—3 of FIGURE 2;

FIGURE 4 is a fragmentary transverse section similar to FIGURE 3 but showing the latch assembly in the open or inoperative positions; and

FIGURE 5 is a fragmentary vertical section taken on the line 5—5 of FIGURE 3, with portions broken away.

The latch assembly is illustrated in the drawings as it is employed for holding in closed position a sliding window frame of the type which is shown in co-pending application of Christenson and Gallup, Serial No. 307,751, filed September 9, 1963. The illustrated window structure comprises a movable sash frame **10** and a relatively fixed sash frame **11**. The movable or slidably mounted sash frame **10** includes a vertically disposed frame side member **12** which in the closed position of the frame **10** occupies the position shown in the drawings relative to a vertically disposed co-operating or mating frame member **13** constituting part of the fixed sash frame **11**. The frame members **12** and **13** are hollow sections of generally rectangular shape formed from extruded metal such as aluminum or stainless steel. The sliding sash **10** has a swinging or hinged movement about a vertical axis near the end of its movement into closed relation with the fixed sash frame **11**, which axis coincides with the frame edge opposite the edge in which the latch assembly **15** is mounted. The sash **10**, as indicated by the arrow in FIGURE 3, swings counterclockwise at the beginning of its opening movement and clockwise at the end of its closing movement. This is required for the frame member **12** to move inwardly and clear the frame member **13** for subsequent sliding movement (to the left as viewed in FIGURE 3) when the sash **10** is opened, and to move into partially overlapped and engaged relation with the frame member **11** when the sash **10** is returned to the fully closed position of FIGURE 3.

The latch assembly **15** is mounted in the hollow frame member **12** which is provided on the inside surface of the front wall **16** thereof with a bearing forming recess **17** for receiving in sliding relation therein a pivot rib formation **18** extending along one edge of the elongate latch plate **20**. The latch plate **20** is bent along a longitudinal axis as shown and provided on its opposite edge with two longitudinally spaced latch tongues **21**, each of which has an abutment forming inside surface **22** facing in the direction of the pivot rib **18** and an adjoining rounded or curved outside surface **23**. The edge of the plate **20** is cut away at **24** (FIGURE 5) between the latch tongues **21** and the latch tongues **21** extend in lateral or offset relation to the plane of the main body of the latch plate **20**. The latch plate **20** is mounted so that it extends across the inside portion **25** of the frame member **12**, which has a rectangular cross section, with the latch tongues **21** disposed in slots **26** provided in the frame wall **27** which confronts the vertical wall **28** of the frame member **13** on the fixed sash **11** and which forms one wall of the outermost or outside section **29** of the frame member **12**. The fixed frame member **13** is recessed at **30** and provided with a keeper forming edge **31** back of which the abutment forming face **22** of the latch fingers **21** engage, as shown in FIGURE 3, when the latch is in closed position. The latch plate **20** is urged towards the closed position by a generally U-shaped spring member **32** mounted between the latch plate **20** and a wall **33** of the frame member **12**. A portion of the wall **27** indicated at **34** in FIGURE 3 forms an abutment stop for limiting the movement of the latch plate **20** in the counterclockwise direction as viewed in FIGURE 3.

The latch plate **20** is provided with an operating finger or arm member **35** which is shaped as illustrated and provided with a recess **36** extending inwardly along one edge thereof with one side opening between parallel spaced wall members forming an entrance slot **37**. The recess **36** and the slot **37** are of a size to permit the operator member **35** to be assembled with the latch plate **20** by a sliding movement longitudinally of the plate **20** with the pivot rib **18** entering the recess **36** and an adjoining portion **38** of the body of the plate **20** having parallel walls and seated in the slot **37** so that the main body of the finger member **35** extends in a direction radially of the axis of the pivot rib **18**. An aperture **39** is provided in the front wall **16** of the frame member **12** to accommodate the finger member **35**. The body of the finger member **35** extends outwardly of the face of the wall **16** so that when turning force is applied to the outer face of the finger member **35** in a clockwise direction, as viewed in FIGURE 3, it will swing the latch plate **20** to move the

latch fingers **21** out of engagement with the keeper ledge **31** on the frame member **13**.

The operation of the latch assembly **15** will be obvious from the description thereof. In the form shown in the drawings, when the movable sash **10** is moved to the left to bring it into the position shown in FIGURE 3, that is, towards the vertical frame **13** of the fixed sash **11** the latch fingers **21** will automatically engage behind the keeper ledge **31** in the recess **30** and the frame **10** will be held in closed position. The latch fingers **21** may be released by depressing the member **35** a sufficient distance to withdraw the latch fingers **21** against the force of the spring **32** (FIGURE 4). When the frame **10** is hinged or swung laterally of the frame **11** in a closing operation the curved faces **23** of the latch fingers **21** will strike the edge of the frame **13** and slide over the ledge **31** and into the recess **30** where the faces **22** will engage in abutting relation with the confronting edge of the ledge **31**.

With the illustrated latch construction, all the latch members may be assembled by axial sliding engagement with each other and within the frame member in which they are mounted. The latch elements are for the most part concealed within the hollow frame. One or more latch fingers **21** may be employed depending upon the latching engagement desired and separate keeper elements may be provided for co-operation with each separate latch finger or several latch fingers may engage with a single keeper forming element such as the ledge **31**. The latch operating finger or push button member **35** may be positioned at any desired point along the latch plate **20** and more than one push button **35** may be provided so that the latch may be operated from different points. The assembly requires no bolts, rivets or similar fastening elements.

While particular materials and specific details of construction have been referred to in describing the illustrated form of the latch assembly, it will be understood that other materials and equivalent structural details may be resorted to within the spirit of the invention.

I claim:

1. A latch assembly for a movable closure which closure is characterized by a hollow frame adapted to seat, when in closed position, against a co-operating, relatively fixed frame which is provided with keeper forming elements, said latch assembly comprising an elongate plate having a pivot forming rib extending along one edge and a plurality of latch fingers spaced along the opposite edge with each latch finger having an abutment surface facing in the direction of the pivot forming rib, said hollow frame having an internal bearing forming recess in which the pivot forming rib on the latch assembly is seated and slots in an oppositely disposed wall of the frame for accommodating the latch fingers, spring means urging the latch plate in a direction to project portions of the latch fingers through the slots in the wall of the frame and into engagement with the keeper forming elements on the fixed frame, and an operating arm member extending radially of the axis of the pivot forming rib for manually swinging the latch plate against the force of said spring means in a direction to withdraw the fingers from engagement with the keeper forming elements.

2. A latch assembly for a movable closure which closure is characterized by a hollow frame adapted to seat, when in closed position, against a co-operating, relatively fixed frame which is provided with keeper forming abutment elements, said latch assembly comprising an elongate plate having a pivot forming rib extending along one edge and a plurality of latch fingers spaced along the opposite edge with each latch finger having an abutment surface facing in the direction of the pivot forming rib, said hollow frame having a front wall with an internal bearing forming recess in which the pivot forming rib on the latch assembly is seated and slots for accommodating the latch fingers in an oppositely disposed wall of the frame which extends in a plane generally normal to said front wall, spring means urging the latch plate in a direction to project portions of the latch fingers through said slots and into engagement with the keeper forming abutment elements on the fixed frame, and an operating arm member extending radially of the axis of the pivot forming rib for manually swinging the latch plate against the force of said spring means in a direction to withdraw the fingers from engagement with the keeper forming elements.

3. A latch assembly for a movable closure which closure is characterized by a hollow frame adapted to seat, when in closed position, against a co-operating outer fixed frame which is provided with a keeper forming outwardly facing ledge, said latch assembly comprising an elongate plate having a pivot formation extending along one edge and a plurality of latch fingers spaced along the opposite edge with each latch finger having an abutment surface facing in the direction of the pivot formation, said hollow frame having an inner wall with an internal bearing forming recess which opens outwardly and in which the pivot formation on the latch assembly is seated and said frame having a wall disposed oppositely of the front wall and in a plane normal thereto with slots therein for accommodating the latch fingers, spring means urging the latch plate in a direction to project portions of the latch fingers through said slots so as to bring the abutment surfaces thereof into engagement with the keeper forming ledge on the fixed frame, and an operating arm member extending radially of the axis of the pivot formation for manually swinging the latch plate against the force of said spring means in a direction to withdraw the fingers from engagement with the keeper forming ledge.

4. A latch assembly for a movable closure which closure is characterized by a hollow frame member adapted to seat, when in closed position, against a co-operating, relatively fixed frame member which is provided with keeper forming elements, said latch assembly comprising an elongated plate having a pivot forming rib extending along one edge and a plurality of latch fingers spaced along the opposite edge with each latch finger having an abutment surface facing in the direction of the pivot forming rib, said hollow frame member having an internal bearing forming recess extending longitudinally therein adapted to receive the pivot forming rib on the latch assembly, said hollow frame member having a wall in oppositely disposed, spaced relation to said bearing forming recess with a portion thereof slotted for accommodating the latch fingers and an adjoining portion forming an abutment which limits the pivoting movement of the latch plate in a direction to project portions of the latch fingers through the slots and into engagement with the keeper forming elements, spring means for urging the latch plate in the direction to engage the fingers with the keeper elements, and an operating arm member extending radially of the axis of the pivot forming rib for manually swinging the latch plate against the force of said spring means in a direction to withdraw the fingers from engagement with the keeper elements.

5. A latch assembly as recited in claim **4**, and said operating arm member having a slot at one end thereof for receiving in sliding engagement therein the pivot forming rib on the latch plate.

6. A latch assembly for a movable closure which closure is characterized by a frame having a hollow section adapted to seat, when in closed position, against a section of a co-operating, relatively fixed frame which is provided with keeper forming abutment elements, said latch assembly comprising an elongate plate having a pivot forming rib extending along one edge and a plurality of latch fingers spaced along the opposite edge with each latch finger having a portion projecting laterally of the face of the latch plate and an abutment surface facing in the direction of the pivot forming rib, said hollow frame section having a wall with an internal bearing formation extending longitudinally of the section in which the pivot forming rib on the latch assembly is seated and

said hollow frame section having an oppositely disposed wall which extends in a plane generally normal to said first mentioned wall and which has apertures for accommodating said latch fingers, spring means urging the latch plate in a direction to project portions of the latch fingers through said apertures and into engagement with the keeper forming abutment elements on the fixed frame, and an operating member extending in a generally radial direction relative to the axis of the pivot forming rib for manually pivoting the latch plate against the force of said spring means in a direction to withdraw the fingers from engagement with the keeper forming elements.

7. A latch assembly for a movable closure which closure is characterized by an elongated hollow frame member forming a latch housing and adapted to seat, when in closed position, against a co-operating fixed frame member which is provided with a keeper forming ledge facing in a direction away from said hollow frame member, said latch assembly comprising an elongate plate having a pivot formation extending along one edge and a plurality of latch fingers spaced along the opposite edge with each latch finger projecting laterally of one side of the latch plate and having an abutment surface facing in the direction of the pivot formation, said hollow frame member having a wall with an elongate internal bearing forming recess which opens in the direction of said fixed frame member and in which the pivot formation on the latch plate is seated and said hollow frame member having an oppositely disposed wall which is in a plane normal to said recessed wall and spaced therefrom with apertures for accommodating the latch fingers, resilient means urging the latch plate in a direction to project portions of the latch fingers through said slots so as to bring the abutment surfaces thereof into engagement with the keeper forming ledge on the fixed frame, and on operating member extending from the pivot formation for manually swinging the latch plate in a direction to withdraw the fingers from engagement with the keeper forming ledge.

8. A latch assembly for a movable closure which closure is characterized by a hollow frame adapted to seat, when in closed position, against a co-operating, relatively fixed frame is provided with keeper forming elements, said latch assembly comprising an elongate plate having a pivot forming rib extending along one edge and a plurality of latch fingers spaced along the opposite edge with each latch finger having an abutment surface facing in the direction of the pivot forming rib, said latch assembly being adapted for mounting in said hollow frame with the pivot forming rib seated in a bearing recess and with the latch fingers adapted to project through slots in a wall of the frame, a spring adapted to urge the latch plate in a direction to project portions of the latch fingers through the slots in the wall of the frame and into latching engagement with the keeper forming elements on the fixed frame, and an operating arm member for manually swinging the latch plate to withdraw the fingers from engagement with the keepers.

9. A latch assembly for a movable closure which closure is characterized by a frame member adapted to seat, when in closed position, against a co-operating, relatively fixed frame member which is provided with keeper elements, said latch assembly comprising an elongate plate having a pivot forming rib extending along one edge and a plurality of latch fingers spaced along the opposite edge with each latch finger having an abutment surface facing in the direction of the pivot forming rib, said closure frame having a wall with a bearing forming recess in the face thereof which confronts the fixed frame member in which the pivot forming rib on the latch assembly is seated with the latch plate adapted to pivot into and out of keeper engaging position, spring means urging the latch plate toward keeper engaging position, and an operating arm member extending radially of the axis of the pivot forming rib for manually swinging the latch plate against the force of said spring means in a direction to disengage the keeper elements.

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M. HENSON WOOD, JR., *Primary Examiner.*

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,220,759 November 30, 1965

Charles M. Miller

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 1, line 49, for "member" read -- members --;
column 4, line 38, for "elongated" read -- elongate --;
column 5, line 42, after "frame" insert -- which --.

Signed and sealed this 27th day of September 1966.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents