United States Patent

Strang

[15] **3,645,573**

[45] **Feb. 29, 1972**

[54] WINDOW LOCK

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[22] Filed: **Dec. 11, 1969**

[21] Appl. No.: **884,222**

[52] **U.S. Cl.** **292/241,** 292/DIG. 38, 292/356

[51] **Int. Cl.** **E05c 3/04**

[58] **Field of Search** .....292/356, 357, 241, DIG. 38, 292/202, 204, 242

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[57] **ABSTRACT**

A lock for a window of the type having upper and lower vertically sliding sections with frame members at the lower and upper edge, respectively, the lock including a lug member with an inwardly facing shoulder for one window section and an element having an eccentric edge for engaging the shoulder for the other of the window sections. The parts are constructed of a firm but resilient plastic material which offers sufficient yieldability to cause the window to stay firmly locked and to compensate for changes in temperature and moisture without becoming unlatched or loose. A single screw is used to attach the element with the eccentric edge and an insert is preferably used to retain the elements of a base member in place.

9 Claims, 5 Drawing Figures

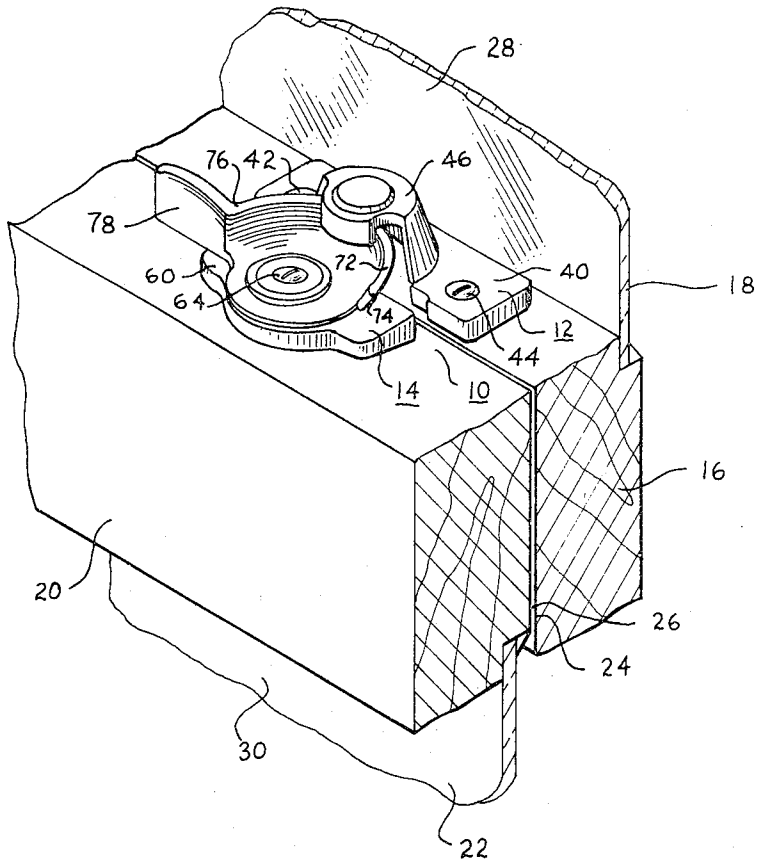


FIG. 1

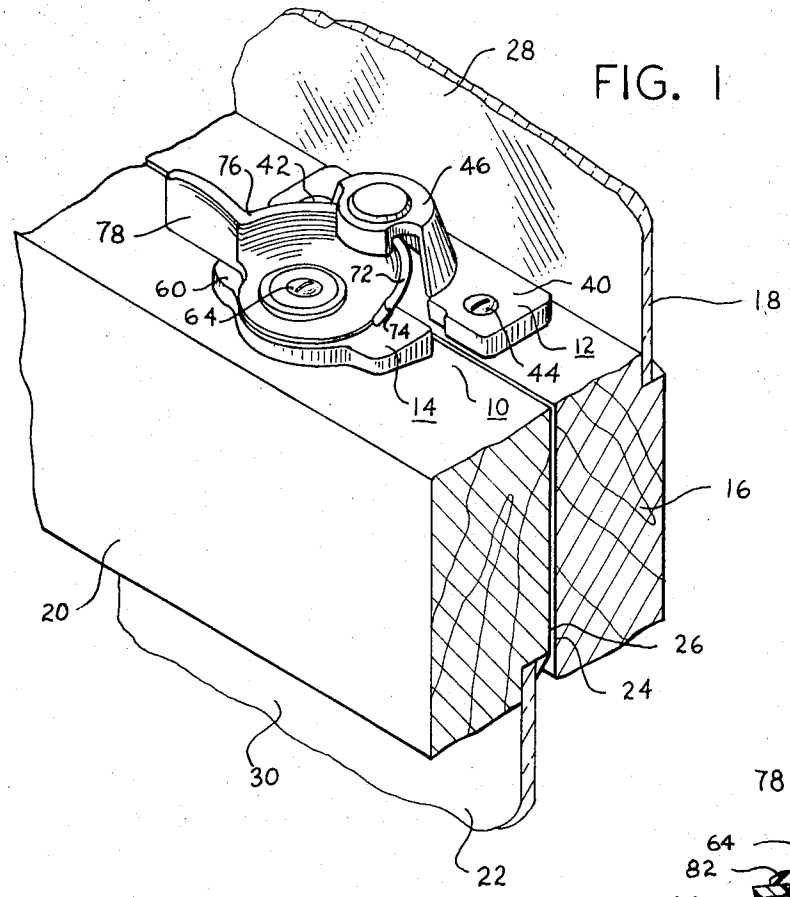


FIG. 2

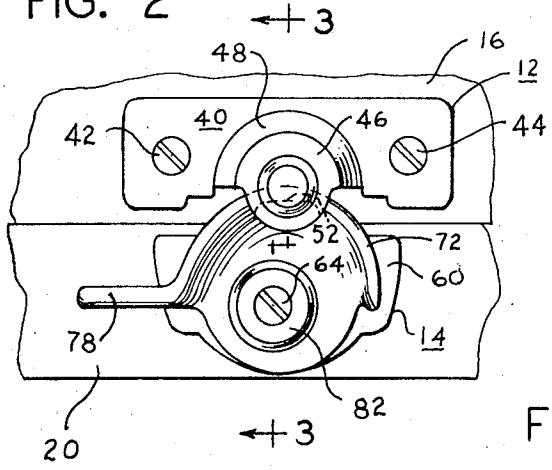


FIG. 3

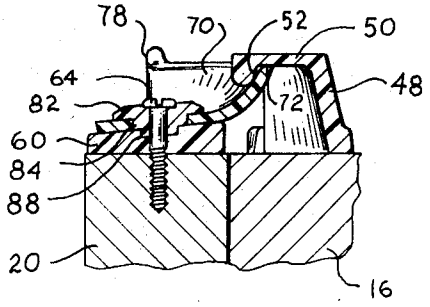


FIG. 4

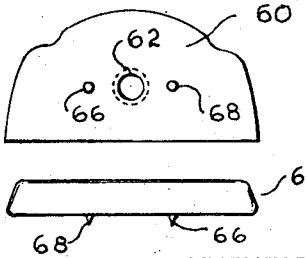


FIG. 5

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WINDOW LOCK

For many years the conventional window lock has consisted of a lug member which is secured to the lower frame of the upper window section and a pivoted eccentric member with a handle for engaging or hooking the lug member and, as it is rotated, drawing the two window sections together and locking them in their closed position. These conventional locks have been constructed of metal, usually of cast or stamped steel coated or plated with brass, and hence have often created a corrosion problem which not only discolors the lock but frequently stains the wood frame adjacent the lock. This problem is aggravated by the frequent condensation and freezing and melting of moisture on the windows during the cold months of the year, and is further aggravated by the removal of the coating or plating material by wearing of the parts. Further, as a result of the wide range of temperature changes at windows, the metal lock parts tend to expand and contract, and as a result, the forces required to retain the window sections firmly locked are frequently reduced, thus reducing the effectiveness of the seal between the window sections and, in some instances, permitting the two lock members to become disengaged and the lock unlatched. This difficulty is further aggravated by expansion and contraction of the wooden window frames as humidity and moisture conditions change from time to time. It is, therefore, one of the principal objects of the invention to provide a window lock which is corrosionproof and which has sufficient inherent resiliency that it effectively compensates for changes in temperature, moisture and humidity conditions.

Another object of the invention is to provide an easily operable window lock, the parts of which act as a constant spring to maintain a positive weather seal between the window sections, and which will not stick or become difficult to open as a result of corrosion of other forms of deterioration from environmental conditions normally occurring with the conventional window lock.

Still another object is to provide a window lock of the aforementioned type which is economical to produce and which can be fabricated in a variety of different colors to permit selection of permanent colors to agree with the decor of the room where it is used.

A further object is to provide a window lock of plastic material which can be easily and permanently installed using fewer screws than the conventional window lock, and which, when installed, will give long, trouble-free service without any care or attention.

Additional objects and advantages of the invention will become apparent from the following description and accompanying drawings, wherein:

FIG. 1 is a perspective view of the present window lock and a fragmentary perspective view of an upper and lower window section on which the present lock is mounted;

FIG. 2 is a top plan view of the window lock shown in FIG. 1 showing the lower frame member of the upper window section and the upper frame member of the lower window section;

FIG. 3 is a vertical cross-sectional view of the lock and fragmentary portion of the upper and lower window section, the section being taken on line 3–3 of FIG. 2; and

FIGS. 4 and 5 are plan and elevational views of a base member of one of the two principal lock parts.

Referring more specifically to the drawings, numeral 10 indicates generally the present window lock having lug section 12 and rotary section 14, section 12 being shown secured to lower frame member 16 of upper window section 18 and rotary member 14 being secured to frame member 20 of lower window section 22. The two window sections are constructed of wood and have inner faces 24 and 26, respectively, for engaging one another to form an effective weather seal when the lock members or parts are fully engaged. Glass panes for the upper and lower window sections are indicated by numerals 28 and 30, respectively. The present window lock is adapted for use in various sizes of windows with upwardly and downwardly sliding sections of conventional and well-known construction and operation.

The lug section or part 12 consists of a base 40 having holes for screws 42 and 44 for securing the lug part to window frame 16. Mounted on base 40 and formed integrally therewith is lug 46 having a generally conically shaped outer sidewall 48, and upper wall 50 formed integrally with the sidewall 48. On the inner side of upper wall 50 is an arcuate shoulder 52 forming an abutment for the interlocking member of the rotary section or part. Base 40 and lug 46 form a relatively rigid structure when secured to frame member 16 by screws 42 and 44 and form a substantially rigid but resilient window-securing member, the resiliency being provided by the plastic material from which the lug section 12 is constructed.

The rotary section or part 14 consists of a base 60 having a hole 62 substantially in the center thereof for receiving the installing screw 64. The base also contains two or more spurs 66 and 68 which penetrate the surface of frame member 20 when the rotary part is secured thereto. This permits the use of a single screw 64 while retaining the base 60 in its proper position and preventing it from rotating when the window is latched and unlatched. Mounted on base 60 is eccentric lock element 70 which has a rim or edge 72 eccentric with respect to screw 64. One end 74 of element 72 is relatively low, and the other end 76 is relatively high and is provided with an operating handle or lever 78. The eccentric and inclined edge 72 slips beneath top wall 50 of lug 46 and behind shoulder 52 as element 70 is rotated in the clockwise direction as viewed in FIGS. 1 and 2 and, since the edge of element 70 is eccentric with respect to screw 64, the lug 46 is pulled toward rotary part 14, thus pulling the two frame members 16 and 20 firmly together as element 70 is rotated to the position illustrated in the drawing with operating handle 78 extending substantially parallel with the frame members.

In order to permit the rotary part to be secured firmly to the frame member 20, an insert 82 having a reduced diameter portion 84 is seated in an enlarged hole near the center of element 70. The inner end of insert 82 seats on the upper surface of base 60, thus permitting element 70 to rotate freely after the rotary part 14 has been firmly secured to the upper surface of frame member 20. In order to hold the parts of the rotary part to retain element 70, insert 82, and base 60 together prior to installation, an interlocking boss and recess 88 are provided on the lower side of the insert and in the upper surface of base 60, respectively. The boss snaps into the recess, thus retaining the three parts together and permitting the screw to be inserted in the hole through the three parts without handling the three pieces separately.

In the installation and use of the present window lock, lug member 12 is secured to frame member 16 of the upper window section by screws 42 and 44, and rotary member 14 is secured to the upper frame member 20 of the lower window section 22 by screw 64 extending downwardly through insert 82, element 70, and base 60 into frame member 20. As screw 64 is tightened, insert 82 seats on base 60, and base 60 is firmly pressed onto the upper surface of frame 20, causing spurs 66 and 68 to penetrate the surface of the frame member, thus retaining the rotary part securely in place. With the window closed and element 70 turned to the position where the handle extends substantially to the lower right-hand position, as viewed in FIG. 3, the lower portion of the edge is then in a position to enter lug part 12 behind shoulder 52. As element 70 is rotated in a clockwise direction, as viewed in FIG. 2, the low edge enters lug 46 behind shoulder 52 and, as the element is rotated further, the eccentric edge 72 draws the lug and rotary parts toward one another, thus drawing the two frame members 16 and 20 firmly together and forming an effective seal between the two window sections, as well as locking the window sections closed.

The character of the material forming the lug part 12 and rotary part 14, i.e., a relatively rigid but resilient plastic material such as acetal resin, referred to in the trade as Delrin, permits the parts to adjust to variations in moisture and heat in and around the window sections. The lock parts made of acetal resin have high strength and stiffness combined with

toughness and resilience over a wide temperature range, good dimensional stability in presence of moisture, high heat-distortion temperature, excellent resistance to all types of organic solvents, excellent bearing characteristics, and good abrasion resistance. When the element is tightened firmly behind shoulder **52**, the resiliency of the plastic material forming the various parts permits the normal changes occurring in the window to be absorbed without reducing the effectiveness of the lock. In the event the wood shrinks from dry atmospheric conditions, the resiliency of the parts takes up the otherwise slack occurrence between the two frame members, thus retaining the window sections firmly together in sealing engagement. While acetal resin, such as Delrin, has been referred to as a suitable material, other plastic materials having suitable strength, firmness and resiliency to form the lock parts may be used. The performance of the plastic lock is distinctly different from the metal lock, in that the former yields sufficiently to compensate for varying conditions without the use of any separate springs, or without damaging either the lock or window parts, as well as remaining firmly locked.

While only one embodiment of the present window lock has been described in detail herein, various changes and modifications may be made without departing from the scope of the invention.

I claim:

1. A lock for a double-hung window comprising a lug part composed of resilient plastic material and having an upstanding member with an inwardly facing shoulder thereon, a rotary part having a base and an element of resilient plastic material with an inclined eccentric edge for engaging said inwardly facing shoulder, securing means for pivotally connecting said element to said base for rotary movement thereon, including an enlarged hole in said element and a recess in said base, an insert with a cylindrical extension projecting through said hole and seating in said recess to retain said element and said base together, and an operating handle on said element at the higher end of said inclined edge, said plastic parts being sufficiently inherently resilient to compensate for charges in temperature and moisture to maintain a secure interlocking action between said parts.

2. A lock for a window as defined in claim **1** in which said lug part and said element are composed of a strong relatively rigid but resilient plastic material capable of yielding without becoming unlatched from one another in response to changes in temperature and moisture condition.

3. A lock for a window as defined in claim **1** in which said base of said rotary part is constructed of the same plastic material as said element.

4. A lock for a window as defined in claim **1** in which a single screw secures said element and base together and said element and base to said upper frame member.

5. A lock for a window as defined in claim **1** in which a center hole is provided in said insert and a screw extends downwardly through said insert, element and base into said upper frame member for securing the aforesaid element, insert, and base together and said rotary part to said upper frame member.

6. A lock for a window as defined in claim **1** in which said base member is provided with downwardly extending spurs for preventing rotation of said base.

7. A lock for a window as defined in claim **5** in which said base member is provided with at least one downwardly extending spur for preventing rotation of said base about said screw.

8. A lock for a window as defined in claim **7** in which said base and insert are composed of the same kind of plastic material as said element.

9. A lock for a window as defined in claim **1** in which said plastic parts are constructed of acetal resin.

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