May 9, 1950 H. K. LIEB 2,506,879

WINDOW LATCH

Filed June 14, 1947

Fig. 1

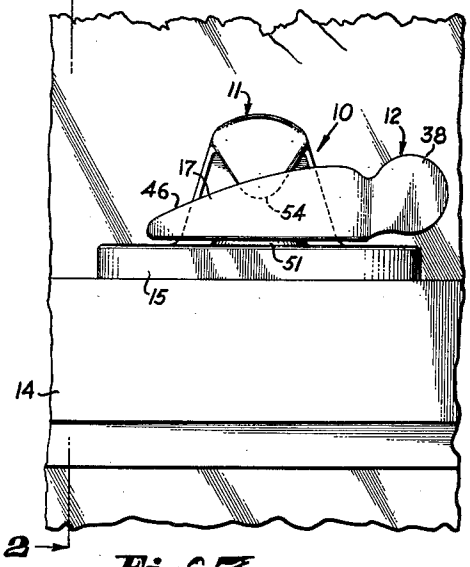


Fig. 2

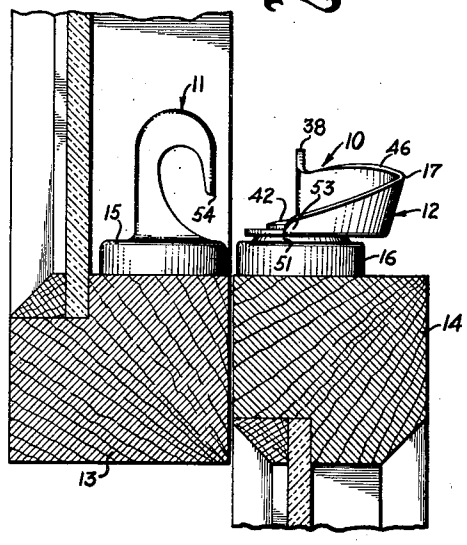


Fig. 3

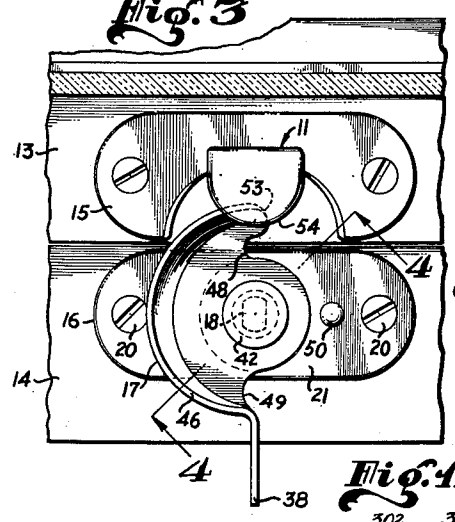


Fig. 4

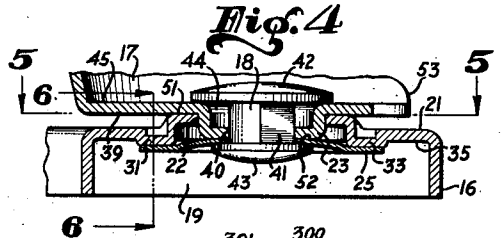


Fig. 10.

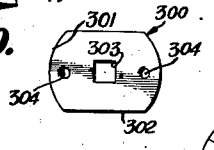


Fig. 7

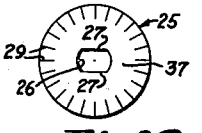


Fig. 6

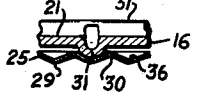


Fig. 11.

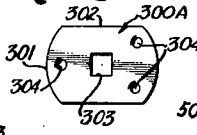


Fig. 9

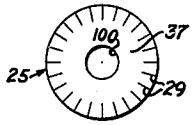


Fig. 5

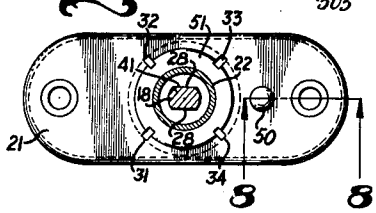
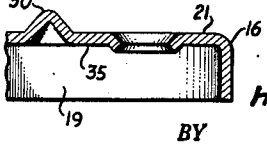


Fig. 8



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WINDOW LATCH

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3 Claims. (Cl. 292—241)

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This invention relates to window latches and more particularly to a new and improved positioning and holding mechanism therefor.

Window latches of the more conventional types do not provide insurance against unlatching. As a consequence it is frequently easy to force or jar the latch into an open position from the outside of the window. Moreover, in certain installations it is desirable that the camming or latching member be positioned in any of a plurality of desired locking angles so that the window may be opened to a slight extent while still being effectively locked against further opening movement. Therefore, some means other than the frictional association of the several members comprising the latch is desirable to insure the proper and firm locationing of the cam member relative to and within the hook. Such locationing mechanism should not require separate manipulation for releasing or setting the same but, on the contrary, should be capable of ready adjustment by means of the conventional thumb piece heretofore associated with mechanism of similar character.

Prior art devices intended to accomplish a like purpose have for the most part been incapable of fine adjustment, many of them having positions of adjustment varying from each other by an angle of approximately 90°. Such prior art devices also present problems in manufacturing which increase their cost, shorten their effective life, or mostly require tedious and time-consuming assembly operations, often by hand. Nonetheless, the alternative to such positioning devices was a stiff, relatively unyielding cam member dependent for its frictional engagement with the base member on a tight abrading pivotal fit therewith.

It is, therefore, an object of this invention to overcome some of the above-noted objections by providing a new and improved friction-type joint between the cam and its base member affording a number of relatively closely spaced set positions in the camming movement of the latch, combining good locking qualities with ready disengageability.

Another object of this invention is to provide a new and improved latch construction of the desired character described which is susceptible of easy and economical manufacture on a mass production basis.

Another object of this invention is to provide a new and improved latch securing mechanism whose frictional positioning features may be easily established during the process of manufacturing.

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Yet another object of this invention is to provide a latching means for windows incorporating a reversible springy device normally hidden from view in the assembled latch but adapted for cooperation with a plurality of complementary detents disposed in a predetermined manner upon the base or cam member.

Another further object of this invention is to provide a latch of the character described substantially all portions of which may be formed by simple stamping and die-forming operation and which may be operatively united during the assembly process by a single pivotal and connecting element.

A further object of the invention is to provide a new and improved latching means which is simple and easy to operate and effective and certain in use.

This invention also has among its objects the improvement of analogous devices in the prior art intended to accomplish a generally similar purpose.

It may be noted that the prior art includes spring-controlled or spring-positioned latching members which are not readily jarred open but such locks have critical positions in which a slight jar will cause the latch element to pivot and snap back to an extreme limit of rotation.

With these and other objects in view, the invention consists in the construction, arrangement and combination of the various parts of the device whereby the objects contemplated are attained, as hereinafter set forth, pointed out in the appended claims and illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a fragmentary view of a window and sash embodying a preferred form of the latching mechanism of this invention.

Figure 2 is a side sectional view on a line 2—2 of Figure 1.

Figure 3 is a plan view of the latch.

Figure 4 is a vertical sectional view on the line 4—4 of Figure 3.

Figure 5 is a plan section taken on the line 5—5 of Figure 4.

Figure 6 is a detailed fragmentary sectional view on the line 6—6 of Figure 4.

Figure 7 is a plan view of a disc.

Figure 8 is a fragmentary sectional view on the line 8—8 of Figure 5.

Figure 9 is another form of a disc.

Figure 10 is another further modified form of disc.

Figure 11 is another still further modified form of disc.

Referring more particularly to the drawings, a window latch selected by way of illustration is generally designated by the numeral 10 and comprises a hook member 11 and a cam-carrying member 12 mounted respectively upon outer and inner window sashes 13 and 14. The hook may be mounted upon a base 15 integral therewith and the cam-carrying member on a base 16 pivotally secured to the cam 17 by a pin or rivet 18.

The base of the cam-carrying member is preferably formed with a hollow center 19 for clearance and is ordinarily secured to the sash 14 by any suitable means, such as screws 20. The top face 21 of the base member may be substantially flat and formed with a central circular opening 22 which may accommodate the pin 18 and a circular shoulder 23 formed in the cam member as will appear.

A spring washer 25 (Figure 7) is non-rotatably keyed to the pin 18 or squeezed into firm frictional engagement with the shoulder 23, with or without keying.

If keyed the washer may have an opening 26 formed with a flat side or sides 27 corresponding to optional flat sides 28 in the pin. The washer may be crimped 29 around its circumference thereby presenting ridges 30, pairs of which are engageable with suitably spaced dimples 31, 32, 33 and 34 formed on the underside 35 of the base member for simultaneous engagement in corresponding suitably spaced depressions 36 formed by and alternating with the ridges 30 in the upper face 37 of the washer.

The dimples 31—34, as illustrated, are four in number and are selectively engageable with a number of said correspondingly crimped parts of the surface 29 of the washer dependent, generally speaking, upon the amount of holding engagement desired between the cam and the base member and the holding tension between such parts.

Inasmuch as it is desirable that the cam 17 upon rotation by the thumb piece 38 be retarded to a predetermined extent with respect to the base member by means of the dimples and crimped washer, it is necessary that the cam 17 in its rotation carry with it the pin and washer. Accordingly, the cam has a flat bottom 39 formed as noted with a circular shoulder 23 intended to ride and rotate within the opening 22 and being optionally keyed for such purpose to the bottom of the cam by means of an opening 40 formed therein with flat sides 41 corresponding to the cross-section of the pin.

In order to insure adequate bearing surfaces and satisfactory tension between the spring washer in its frictional engagement with the underside of the base member and the dimples therein, the pin may be formed with a broad upper head 42 and a lower head 43. The lower head bears tightly upon the underside of the washer while the upper head bears tightly upon the bottom 39 of the cam either within an annular recess 44 formed by the shoulder 23 or against an upper face 45 of the bottom of the cam to an extent preventing relative rotation to these parts, whether they be otherwise secured together or not.

The cam itself has an upper cam face 46 normally engageable within the hook 11 and which, upon forced rotation in a counter-clockwise direction, places an increased tension upwardly upon the hook firmly securing a window in closed position. Lesser degrees of forced engagement of the cam with the hook locks the window less securely, but preferably, the relationship of the cam and hook should be such that the window even in the loosest relationship of these parts cannot be forced from the outside.

The limits of rotation of the cam are established at approximately 180° by its engagement at either notched edge 48 and 49 with a stop 50. The notched edge 48 thereby prevents rotation of the cam beyond its highest edge adjacent the thumb piece 38 and similarly, the notched edge 49 is engageable with said stop to prevent rotation beyond what is necessary to cause the open latch to clear the window sashes 13 and 14.

Although the pin 18 has heretofore been described as optionally keyed to the cam member 17 and the washer 25, such keying, as also noted, is not necessary. Instead the washer and bottom of the cam may be squeezed together at their adjacent faces by the pin or rivet 18 during the assembly process. In such a case the depth of the annular shoulder 23 relative to the raised annular bearing face 51 surrounding the opening 22 should be adjusted so that the washer may be pressed firmly against the bottom face 52 of the annular shoulder 23 and there held in firm frictional engagement sufficiently great to over-come the holding action of the crimped edge 29 with the dimples 31—34. Such non-keyed construction in which the pin 18 is round in cross-section is more readily and economically manufactured because there is then no necessity for adapting correspondingly keyed portions of the cam, pin and washer to each other as is otherwise required. Such a non-keyed washer is shown in Figure 9 where all parts are numbered to correspond to the form of Figures 1–8 except that the circular hole is there designated by the numeral 100. In using this form of washer the pin 18 may be cylindrical in cross-section and the flat faces omitted.

The washer 25 may also be dished or funnel-shaped either to enhance its resilient qualities or to bring it in closer frictional contact with the underside of the annular shoulder 23.

It should be noted that the crimped edge 29 may be formed with any other desired irregularities than the ridges and grooves illustrated. Thus, they may be serrated, dimpled, perforated or otherwise shaped to fit against complementarily formed constructions on the adjacent base member and vice versa.

Optionally also, the spring washer may be disposed between the adjacent faces 39 and 51 of the cam member and base member respectively, and these parts may either or both be designed to yieldably engage the spring washer by means of suitable detents or irregularities therein as heretofore discussed in connection with the cam member.

In the use and adjustment of a latch of the character herein contemplated, the same will be open when disposed in the position illustrated in Figures 1 and 2. But by turning the cam at an angle of approximately 90°, the tip 53 of the cam will underlie the tip 54 of the hook as shown in Figure 3 to an extent permitting the window to open only slightly.

In view of the proximity of the corresponding irregularities or crimps in the washer a relatively fine adjustment is possible so that varying degrees of latching engagement of the hook and cam are achievable. Each angle of adjustment, although requiring a minimal amount of force

to overcome, and while readily changed by manipulation of the cam through the thumb piece **38**, is nevertheless sufficiently stiff to withstand any opening movement of force created by the forcible jambing of the hook against the cam edge **46** as is frequently attempted in unlatching the window from the outside.

A further modified form of washer **300** is illustrated in Figure 10 and comprises a generally rectangular shape with narrow ends **301** having a radius and with straight parallel sides **302**. At its central opening **303** may be formed either a round, square, or irregular cross section. This form of washer may be formed in the same manner as the others or may have any number of indentations **304** which preferably face only one way and, of course, in such event the washer would not be reversible as in the forms of Figure 7 and 9 unless the indentations **304** were matched by corresponding indentations facing in the opposite direction. In this form of washer a flexing action is achieved in the longitudinal axis thereof as from edge **301** to edge **301** and in order to achieve a suitable number of locking positions the base **16** may be formed with a plurality of indentations corresponding to desired locking positions of the indentations **304**. Thus, for example, the washer may be formed with two indentations (Figure 10) or three indentations (Figure 11), these numbers being desirable as stabilizing the washer in its flexed locked position. It has also been found that approximately **24** indentations in the adjacent face of the base, arranged in a circle corresponding to the possible positions of the indentations **304**, furnish a desired variety of locking positions.

It may be noted that in the rotation of a disc each projection, depression, detent, crimp, crimped surface, etc., tends to wear against the corresponding formation on the base, thereby increasing the wear on both the washer and the base. The provision of fewer detents upon the washer thereby minimizes the wear upon these elements as caused by successive operations of the latch. It is therefore best to keep either the number of detents in the washer or the base to a minimum.

The washer may be round, rectangular, or rectilinear in part, and rounded in part in any of its forms or modifications thereof.

The instant latch may be made of brass or other strong but deformable metal, or like material, inasmuch as it is contemplated that all of the parts of applicant's latch may be readily stamped and formed in single operations, with the possible exceptions of the pin **18** which may be of conventional construction, and the washer, which should be of springy steel or similar stuff. Thus, the single pin, during the assembly operation, may act to firmly unite all of the parts of the cam-carrying member **12**. The hook member **15** itself may be of conventional construction.

The term "crimped" is intended to mean irregular, indented, dimpled, or the like, as well as crimped unless the contrary is expressly stated.

This invention features a window latch or the like susceptible of ready but jimmy-proof adjustability in a wide variety of latching positions, all of which are available with equal facility and may have substantially equal holding properties. The parts are designed for ease of manufacture and the washer in particular is designed for reversible assembly so that these parts may be fed to an

operator or assembly machine through a hopper. The construction also permits the inclusion of as many points or degrees of secure frictional engagement of the operative parts as required by the simple provision upon adjacent faces of any desired number of holding irregularities. The washer may, of course, be round, square, oval, or any other desired shape, even rod-like.

While I have herein shown and described my invention in what I have conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of my invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices.

The invention having been herein described, what is claimed and sought to be secured by Letters Patent is:

1. A window sash lock adapted to lock double hung windows comprising a keeper, a cam latching means, said cam means being formed with a downwardly directed boss adapted to act as a bearing guide, a base member having downwardly turned peripheral flanges and being formed with a centrally disposed aperture adapted to rotatably receive said downwardly disposed boss, a friction disc having peripheral edges adapted to frictionally engage the under surface of said housing member and keyed in non-rotational engagement to said downwardly extending boss, said friction disc being formed with a plurality of radially disposed corrugations.

2. In a window sash lock having a keeper and a rotatable cam latch, rotatably disposed on a hollow base member, the element of novelty comprising: means for frictionally retaining the said cam member in a plurality of rotatable positions, said means comprising a friction disc keyed to said rotatable cam member and positioned within the hollow of said base member and adapted to frictionally engage the under surface thereof, said disc being formed with a plurality of radial corrugations, and a plurality of detents circumferentially disposed in said base member adapted to cooperate with said friction disc.

3. In a window sash lock having a keeper, a rotatable cam latch and a substantially hollow base member, a centrally disposed downwardly directed boss formed as an integral part of said rotatable cam and being formed with a non-circular aperture concentric therewith, a friction disc being formed with a non-circular hole concentric therethrough and with a plurality of radially disposed corrugations adjacent the periphery thereof adapted to underlie said hollow member and to secure said cam member to said hollow base member, and a plurality of detents circumferentially disposed about the axis of rotation of said cam and adapted to cooperate with the radial corrugations of said disc.

HARRY K. LIEB.

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