April 26, 1949. A. H. VERHOFF 2,468,646

SASH LOCK AND METHOD OF MAKING THE SAME

Filed April 20, 1946

Fig. 1.

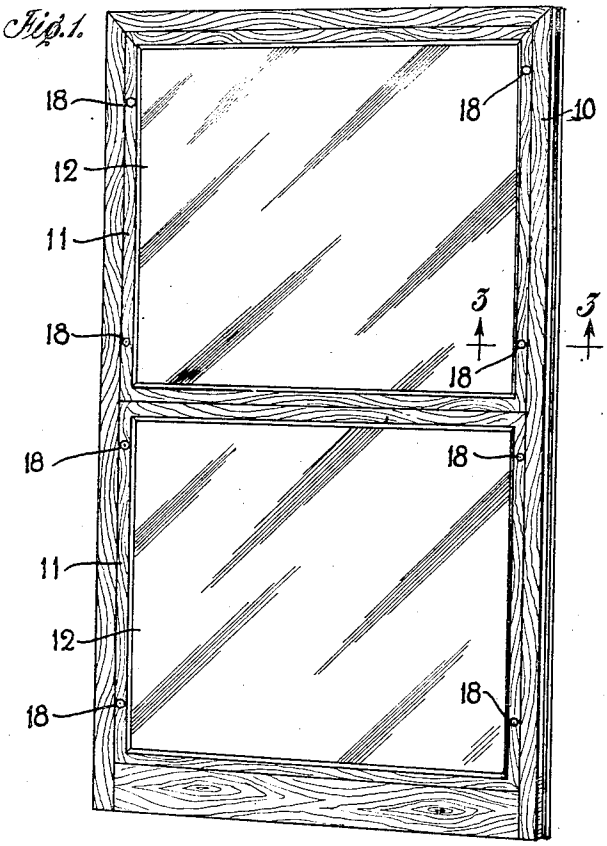


Fig. 3.

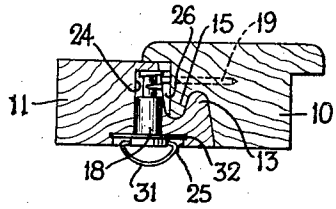


Fig. 4.

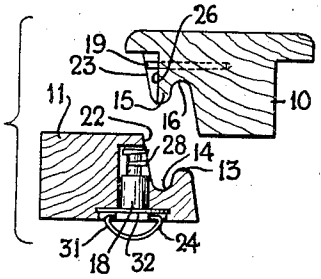


Fig. 5.

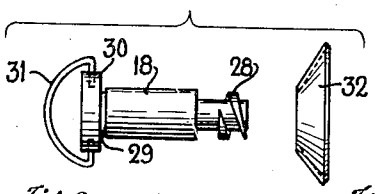


Fig. 2

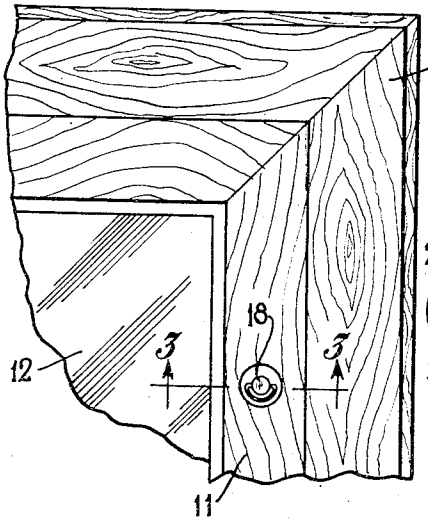


Fig. 6

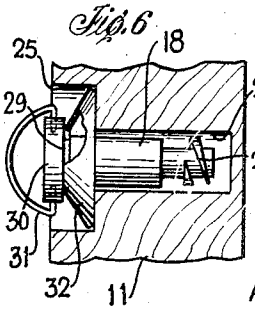
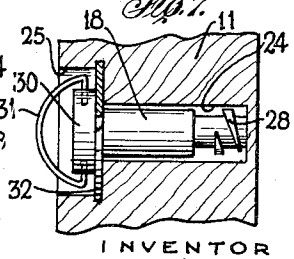


Fig. 7.



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SASH LOCK AND METHOD OF MAKING THE SAME

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8 Claims. (Cl. 292—251)

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This invention relates to builders hardware, and more especially it relates to sash locks that advantageously may be employed for securing in place the sashes of windows and window screens, although other applications of the invention will be apparent to those skilled in the art.

The invention is of especial utility in its use with storm windows and window screens of the type shown in U. S. Patent No. 2,079,283 of Harold A. Etling, issued May 4, 1937. In the structure of the patent mentioned, a supplemental frame is provided, which frame is permanently secured in a window opening. A pair of sashes, either with glass panes or screening therein, are mounted in the supplemental frame, there being complemental tongues and grooves formed on the frame and sashes so that there is a close interfitting of the parts. Locking means are provided for retaining the sashes in the frame. Due to wood of the frame and sashes becoming swollen from moisture, or because of paint applied over the juncture of the parts, it frequently has been extremely difficult to remove the sashes from the frame, especially since removal is best effected by moving the sashes inwardly in a direction normal to the plane of the frame. It is to the relief of this condition that this invention primarily is directed.

The chief objects of the invention are to provide an improved sash lock of the character mentioned that will become a permanent part of the sash; to provide an improved sash lock whereof the operation of locking the sash also draws the sash tightly into engagement with the frame in which the sash is seated, and unseats the sash from the frame during the unlocking operation; and to provide a method of assembling the elements of a sash lock with each other and with a sash. Other objects will be manifest as the description proceeds.

Of the accompanying drawing:

Fig. 1 is a perspective view of a supplemental frame with two window sashes mounted therein, and sash locks embodying the invention retaining said sashes in the frame;

Fig. 2 is a detail elevation, on a larger scale, of a portion of the structure shown in Fig. 1;

Fig. 3 is a section, on a larger scale, on the line 3—3 of Figs. 1 and 2;

Fig. 4 is a view similar to Fig. 3 with the frame and sash elements shown in disassociated relation;

Fig. 5 is a side elevation of elements of the sash lock before the same are assembled in operative relation;

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Fig. 6 is a side elevation of elements of the sash lock mounted in a socket in a sash (shown in section), before they are permanently assembled to each other; and

Fig. 7 is a view similar to Fig. 6 showing the several parts in permanently assembled relation.

Referring to the drawing, there is shown, by way of example, a storm window installation comprising a supplementary frame 10 adapted to be mounted in a window opening, on the outside of the conventional window frame, said supplemental frame being permanently mounted in this position. Carried by the supplemental frame 10 are window sashes 11, 11 provided with the usual glass panes 12, although sashes provided with screening may be substituted therefor. As is best shown in Fig. 4, the frame 10 has its inner margin formed with a tongue 15 and groove 16, and each sash 11 is formed on three sides with a tongue 13 and groove 14, the latter tongues and grooves being complemental to the tongues and grooves 15, 16 aforesaid, and adapted to interfit therewith as is clearly shown in Fig. 3. The arrangement is typical of the construction shown in Patent No. 2,079,283 aforementioned. The sashes 11 are removably secured in the frame 10 by a plurality of sash locks, each of which comprises a rotary member 18 that is mounted in a sash and a fixedly positioned keeper stud 19 mounted in the frame 10 for cooperation with the said member 18. As shown, each sash is provided with four sash locks, but it will be understood that a greater or fewer number may be employed if desired.

Referring to Figs. 3 and 4 it will be seen that the confronting margins of the sashes 11 and frame 10, in which are formed the complemental tongues and grooves, have cooperating surfaces that are somewhat obliquely disposed to the plane of the frame and sashes therein, said surfaces facilitating removal of the sashes from the frame. One of the said surfaces on a sash is shown at 22, Fig. 4, and the complemental surface on the frame is shown at 23 in the same figure. The rotary member 18 of each sash lock is received in a bore 24 in the sash, which bore extends from a counterbore 25 on the inner face of the sash to a substantial depth in the sash, but does not extend to the outer face thereof. The bore 24 is located adjacent the margin of the sash, the arrangement being such that the inner end portion of said bore intersects the oblique marginal surface 22, with the result that the inner end portion of the bore 24 is open to the margin of the sash, and the inner end portion of the rotary

member 18 therein is exposed, and is accessible to the keeper stud 19. The latter is simply driven into the marginal portion of the frame 10, in the region of the oblique surface 23, in which surface a recess 26 is formed, the projecting end portion of the stud 19 being located in said recess, but not projecting beyond the said oblique surface.

The rotary locking member 18 is a generally cylindrical structure having one end portion thereof of substantially reduced diameter and formed with a heavy screw thread 28. At its other end portion the member 18 is formed with a reduced neck or circumferential groove 29, and a terminal head or flange 30 that constitutes one side of said neck 29. A hingedly mounted finger grip member 31 is carried by the head 30. The locking member 18 is mounted in the bore 24 with its head 30 located in the counterbore 25, the thread 28 of the member being located in that region of the bore 24 that is exposed by reason of its intersection of surface 22, as previously explained. The member 18 is fixedly secured in the position stated by a washer 32 that has its inner circumferential region received within the neck or groove 29, the periphery of the washer being embedded in the peripheral wall of the counterbore 25, at the bottom thereof. The lock thus becomes a permanent part of the sash and will withstand considerable axial thrust without displacement. Furthermore, there is sufficient clearance between the washer 32 and the surfaces of the neck or groove 29 to enable the locking member 18 readily to be rotated manually simply by grasping the hand grip member 31 and twisting the same.

The method of assembling the elements of the sash lock with each other and with a sash is best shown in Figs. 5 and 6 to which attention now is directed. As shown in said figures, the washer 32 initially is of frusto-conical or dished shape, and is separate from the locking member 18, the central hole in the washer being of such size as to enable the cylindrical medial portion of the member 18 to pass therethrough with slight clearance. In the assembling of the locking member and the washer 32, said washer is positioned within the counterbore 25 of the sash, and the member is inserted through the axial opening of the washer so as to extend into the bore 24 in the sash, with its head 30 abutting the small end of the washer. Axially directed force is then applied to the head 30 of the latching elements, any suitable device or tool (not shown) being used for this purpose. By reason of said force, the locking element is urged toward the closed end of sash bore 24, and the head 30 of the locking element is urged against the small end of the frusto-conical washer 32. This exerts an axial clamping pressure upon the confined washer that deforms the same and flattens it against the bottom of counterbore 25, as shown in Fig. 7. In flattening, the inner circumferential region of the washer is constricted and moves into the groove or neck 29 of the locking element, thus permanently uniting these members to each other. At the same time the peripheral region of the washer is expanded or distended and forced radially outwardly into the wood of the sash around the counterbore 25, with the result that the washer becomes permanently interlocked with the sash by reason of its peripheral embedment in the wall of the counterbore. As previously stated, the washer 32 does not grip the locking element tightly, and the latter readily may be rotated, relatively of the washer, when desired.

The operation of the improved sash lock readily is understood. When a sash 11 is to be mounted in the frame 10, the tongue and groove formations on the said members interfit with each other, the sash being pressed into the frame in a direction normal to the plane of the frame, movement of the sash ceasing when the threads 28 of the locking members strike the projecting studs 19 of the frame. Then by the manual turning of the locking members, by means of their finger grip elements 31, the said threads 28 thereof are caused to engage said studs 19, with the result that the sash is drawn into fully seated position in the frame, as shown in Fig. 3, and firmly retained in such position against accidental removal. To remove a sash from the frame, the procedure described is reversed, at which time the threads 28 of the locking members 18 exert a strong cam action upon the studs 19 and forcibly initiate separation of sash and frame, notwithstanding such sticking as may result from moisture-swelling or paint. After the sash locks have been turned sufficiently to disengage their threads 28 from the studs 19, the sash easily is lifted from the frame.

Modification may be resorted to without departing from the spirit of the invention or the scope of the appended claims, which are not limited wholly to the specific construction shown or the exact procedure described.

What is claimed is:

1. A sash lock of the character described consisting of a rotary member carried by a wooden sash, and adapted to interlock with a member fixed in a structure to which the sash is to be attached and which member is engageable by the rotary member upon rotation thereof, said rotary member comprising a cylindrical structure formed with a circumferential groove, and a washer having its inner circumferential portion received in said groove so as to constitute a bearing for the rotary member, said washer located in a counterbore in the sash and having its peripheral region permanently interlocked with the wooden structure of the sash.

2. A combination as defined in claim 1 whereof the peripheral region of the washer is embedded in the wall of the counterbore.

3. A sash lock of the character described comprising a rotary member carried by a wooden sash and adapted operatively to engage a member fixedly mounted in a structure to which the sash is to be locked upon rotation of said rotary member, said rotary member comprising a one-piece generally cylindrical structure mounted in a bore and counterbore in the sash and formed with locking means on the inner end thereof, and having a head of larger diameter on its opposite end connected to the member by a neck of reduced diameter, and a washer on the member having its inner circumferential region located about said reduced neck portion so as to be permanently interlocked with the rotary member, the peripheral region of the washer having a radially directed press fit whereby it extends into the wall of the counterbore.

4. The method of forming a sash lock which comprises providing a bore and counterbore in a sash, forming a locking element consisting of a generally cylindrical structure having at one end an enlarged head and a circumferential groove contiguous with said head, mounting a truncated washer upon the locking element with the head thereof confronting the convex side of the washer and the inner circumference of the latter in cir-

cumscribing relation to said groove, mounting the assembled structure in the sash-bore with the washer and head located in the counterbore, and then moving the locking element axially, farther into said bore, whereby the washer is confined and flattened between the head of the locking element and the bottom of the counterbore and its inner circumferential region constricted and moved radially into said groove so as permanently to interlock therewith, retaining rotatability of the locking element in the washer.

5. The method of forming a sash lock which comprises forming a bore and a counterbore concentric therewith in a wooden sash, positioning a locking element and a frusto-conical washer circumscribing the same within said bore and counterbore, and then flattening said washer so as to contract its inner circumference into permanent interlocking engagement with said locking element and retaining rotatability of the locking element in the washer, and concurrently to distend the perimeter of the washer into permanent interlocking engagement with the wall of the counterbore.

6. The method of forming a sash lock which comprises forming a bore and a counterbore concentric therewith, forming a locking element of generally cylindrical shape having an enlarged head on one end thereof and a circumferential groove contiguous with said head, positioning a frusto-conical washer upon the said element with its smaller end abutting said head and its inner circumference in circumscribing relation to said groove, positioning the assembled structure within said bore and counterbore, and then forcing said locking element axially farther into said bore whereby the pressure of the head against the washer flattens the latter, constricting the inner circumference thereof so that it moves into the groove in the locking element, and concurrently distending the perimeter of the washer so that it produces an undercut in the wall of the counterbore and seats itself therein.

7. The method of making a sash lock which comprises providing a generally cylindrical structure with a headed portion and a cylindrical groove in the shank portion closely adjacent the headed portion, mounting on the shank a washer of dished shape having an inner opening of diameter larger than the greatest transverse dimension of the shank portion but smaller than the said dimension when the washer is flattened, inserting the said shank into a sash in an opening whose greatest transverse dimension is larger than the outer diameter of the washer when dished but less than said outer diameter when the washer is flattened, and then flattening said dished washer.

8. In combination, a structural member, and a locking device therefor, said member having a bore with a counterbore, and said locking device comprising a shank slidable in the said bore, a headed portion and a peripheral groove in the shank immediately under the headed portion, and a washer of dished form having a central opening slidable over the said shank and an outer periphery slidable in said counterbore, the edges of said opening being receivable in said groove without preventing turning of said locking device in said opening and said periphery having a diameter in excess of that of the counterbore on flattening of the washer.

ANTHONY H. VERHOFF.

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