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M. YANESON
LOCK SCREW DEVICE

2,152,231

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Fig. 1

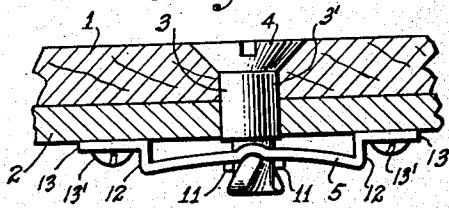


Fig. 2

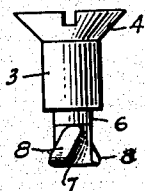


Fig. 3

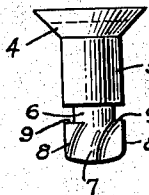


Fig. 4

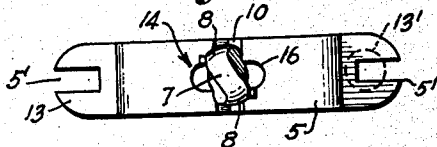


Fig. 5

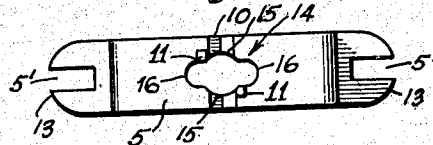


Fig. 7

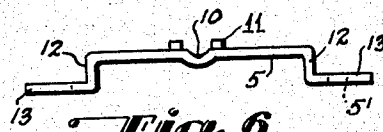
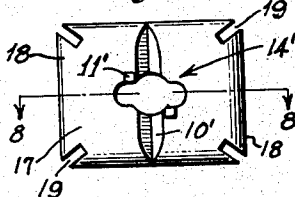


Fig. 6

Fig. 9

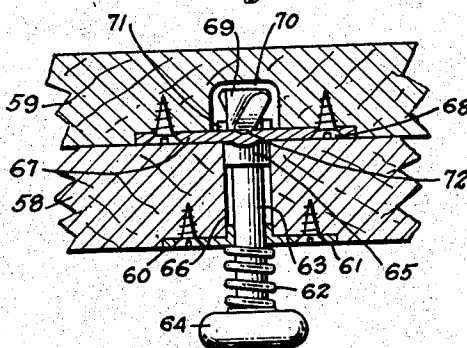


Fig. 8

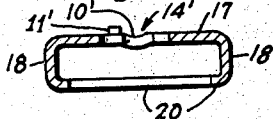


Fig. 11

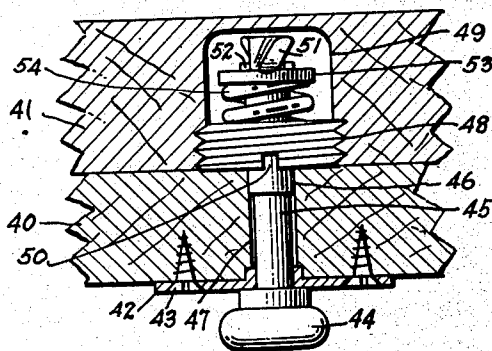
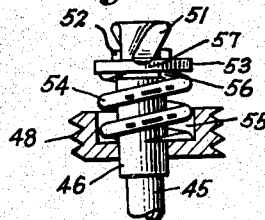


Fig. 10

INVENTOR
Michael Yaneson
BY *Haseltine, Lake & Co.*
ATTORNEYS

UNITED STATES PATENT OFFICE

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LOCK SCREW DEVICE

Michael Yaneson, Newark, N. J.

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4 Claims. (Cl. 85-5)

This invention relates to screw locks or locking means with particular reference to the type in which a locking member is provided with a special locking head adapted to pass through and cooperate with a plate having an aperture of suitable form.

The main object of my invention is to provide a locking means to replace screws and bolts in various structures in which the locking member is automatically locked in final effective and useful position upon being forcibly turned only part of a revolution.

Another object is to have locking means of the character indicated which can be made at a low figure and is simple and durable in construction.

A further important object is to have such a locking means which when once locked in place, will not rattle loose from the effects of jarring or vibration.

Yet another object is to have a locking means of this type which can be removed at will, but when locked in place is positively retained and very strong.

Other objects and the several advantages of my invention will appear more fully as the specification proceeds.

In the accompanying drawing forming part thereof,

Fig. 1 is a side elevation of the locking means or lock screw embodying the invention in a practical form and used to hold two members together which are shown in section.

Fig. 2 is a view of the screw member alone of Fig. 1.

Fig. 3 is another view of the same as partly rotated to a different position.

Fig. 4 is another view of the same embodiment of the invention as seen from below in Fig. 1.

Fig. 5 is a similar view of the plate member alone of Figs. 1 and 2.

Fig. 6 is a side elevation of the plate shown in Fig. 5.

Fig. 7 is a plan view of a modification of the plate of Figs. 1, 4, 5 and 6.

Fig. 8 is a section of the same on line 8-8 in Fig. 7.

Fig. 9 is a fragmentary view of a door or window, etc., with part of the frame, etc., against which it abuts, a modification of the invention being applied to prevent rattling and vibration.

Fig. 10 is also a fragmentary view of similar parts with another modification of the lock screw, etc., embodying the present invention used for the same purpose.

Finally, Fig. 11 is another view of the same form of the invention partly in section to disclose details of structure.

Throughout the views, the same reference indicia denote the same or like parts.

In automobile chassis and bodies, airplane fuselages and other structures, as well as in radio cabinets and other cabinets and mechanical devices, it is often desirable to have some readily applied securing and locking means which can be put into place instantly and yet securely without using a screw driver or wrench for any great length of time or for many turns of the screw involved. It is of course necessary to have absolutely positive locking and security effected without danger of broken threads or loss of the screw or loosening of the same by vibration.

Hence, in the practice of my invention, if a pair of boards, pieces of metal or other structural members indicated at 1 and 2 are intended to be secured together, a locking screw 3 is inserted through said members after the same have been appropriately drilled and one member preferably countersunk to accommodate the screw head 4. Of course, the head of the locking screw may be cylindrical as indicated at Fig. 2, hexagonal, oval or round, or in fact, any desired shape to suit the user, and may even be formed into a socket.

However, beneath structural member 2 is placed a retaining yoke 5, preferably of metal and having an aperture therethrough of special form and through which a reduced portion 6 of the locking screw extends. This reduced portion is practically cylindrical and concentric with the main body 3 of the screw, and, upon the end of the reduced portion is fixed a head 7 formed of a pair of screw shaped or helical blades 8, 8 together having at least the same diameter as that of the screw body 3, and terminating in a pair of shoulders 9, 9. In order to cooperate with said shoulders 9-9 on the head 7, a transverse depression or groove 10 may be formed on the yoke, so that the shoulders will tend to seat therein when the head has been passed through the yoke and the screw given a partial turn. The shoulders on said head are brought to a positive stop in a well seated position by a pair of opposite fixed projections or stops 11, 11 at the sides of groove 10. If desired, the ends or feet 13, 13 may be slotted as at 5', 5' to accommodate screws which are intended to retain the yoke in position, the head of such a screw being indicated at 13'.

The yoke, in order to make the mentioned

seating of the two shoulders effective, is made substantially in the form of a spring by having the ends bent at 12, 12 and terminating in a pair of feet 13, 13 for supporting the yoke and spacing the main portion thereof away from the member 2. The immediate result is that the yoke is partly resilient and compensates for a certain range of variations in the thickness of the structural members which are to be secured together.

The aperture in the yoke, generally indicated at 14 has the arcuate portions 15, 15 which fit upon the reduced portion 6 of the locking screw, while opposite elongated portions 16, 16 provide clearances for the blades 8, 8 of the head 7 of the screw which allow said head to pass through the yoke plate 5.

The procedure of applying or removing the locking screw is very simple. If the members 1 and 2 are brought together and the yoke member 5 then held in position temporarily by the hand, with the feet 13, 13 resting against the exposed side of member 2 and the aperture 14 registering with the hole 3' through both structural members, it is but necessary to introduce the screw head 7 and shank 3 through members 1 and 2 and only initially introduce head 7 alone into aperture 14, when it will be possible to cause the head to climb through said aperture by merely giving the screw a partial turn. The head 7 will come to rest against stops 11, 11 with shoulders 9, 9 seated in groove 10, the yoke plate 5 springing slightly outward away from member 2 by tending to straighten and maintaining the parts in assembled relation by being under compression, and confined by head 7.

Removal is accomplished by giving the screw a part turn in a reverse direction, freeing it from yoke plate 5 by causing blades 8, 8 to register with the elongated clearances 16, 16 of the aperture, when the yoke will spring free and the screw may be directly withdrawn.

Modifications of both locking screw and yoke plate are of course possible, as well as different applications thereof. For example, in Figs. 7 and 8, the yoke plate 17 has the channel or groove 18', the stops 11', 11' and aperture 14' corresponding to similar parts upon yoke 5, but upon all four sides, the edges are bent down as at 18, 18 separated by corner slots 19, 19 and terminating in feet 20. This form is stiffer and more condensed than yoke plate 5, but cooperates with the screw in the same manner.

In Fig. 9, a window or door 58 is partly shown abutting against a portion of a frame 59 and is intended to be held secure against rattling and vibration due to wind or other causes and for this purpose the door or window is provided with a plate 60 secured by means of screws 61 or nails, etc., and through which the shaft 63 passes, upon the outer end of which a knob 64 is secured for turning said shaft 63 which carries an enlarged portion 65 capable of being drawn through the hole 66 in member 58. This enlarged portion or collar 65 upon the shaft 63 normally abuts against a yoke plate 67 secured by means of screws or the like, as at 68, to the frame 59, while said frame has a hollow portion 70 for accommodating the screw head 69 upon the inner end of shaft 63, while the plate 67 naturally has an aperture similar to the aperture 14 of Fig. 5 and has a transverse groove or seat 72 cooperating with stops 71 similar to stops 11 in Fig. 1 in order to provide a final seated position of the screw head in the cavity 70.

In order to withdraw the screw head 69 from

the yoke plate 67 it is of course but necessary to partly rotate knob 64 in a counterclockwise direction similar to the manipulation of the screw of Figures 1 to 4 and the screw head will then pass through yoke plate 67 into the hole 66 in member 58. A spring 62, coiled about shaft 63 exterior of plate 60, tends to expand and draw the enlarged portion 65 outwardly through hole 66, until said portion meets the plate 60, and it is obvious that in this position the enlarged portion 65 and the screw head 69 are entirely contained within the hole 66 in member 58 without any connection with yoke plate 67 or frame 59. When the parts are thus disconnected and idle, it is naturally possible to shift the position of the window or door with respect to the frame 59, while on the other hand, when it is desired to secure the same together in order to lock the window or door in place so that the same cannot rattle, it is only necessary to push the knob 64 inwardly until screw head 69 engages in the yoke plate 67, when a partial clockwise rotation of the knob will cause the screw head to climb through yoke plate 67, and become seated against the stops 71 in the groove 72. In this position the door or window 58 is securely held against the frame 59 in rigid manner. The shaft 63 has a reduced portion between the enlarged portion 65 and screw head 69 similar to the reduced portion 6 shown in Figures 2 and 3, although this does not appear in Figure 10, but naturally must be present in order to allow for the screw head and the shaft to properly engage with the yoke plate 67.

A modification of the foregoing is shown in Fig. 10, wherein a door or window 40 may be held against a frame or the like 41. Upon the door or similar member 40 is a plate 42 secured by means of screws 43 or the like, while exteriorly of said plate is a knob 44 secured to a shaft 45 having an enlarged portion 46 capable of being moved longitudinally in the hole 47, in said member 40, and normally extending through a screw threaded collar 48 screwed into the open end of a cavity or hole 49 in the frame 41. For the purpose of screwing this collar into position a spanner wrench or special screw driver engaging in slots 50 may be used, but any means known in the art may of course be employed to set said threaded collar in place. As also shown in Figure 11, more clearly, the collar 48 has a concave seat portion 55 into which a spring 54 extends while upon the other end of this spring is mounted a yoke plate 53 provided with stops 52 similar to stops 11 of Fig. 1. The inner end of the shaft 45 above the enlarged portion is provided with a screw head 51 capable of engaging against stops 52 when seated in the channel or groove 57 in the yoke 53.

The yoke is of course also provided in this case with an aperture similar to 14 in Figure 5, while shaft 45 beyond the enlarged portion 46 is likewise provided with a reduced portion 56 immediately beneath or within the head 51. The spring 54 is riveted or otherwise secured to the yoke 53 and to the threaded collar 48 so that loss of the yoke is prevented. When the window or door 40 is intended to be held against frame 41 in a manner to prevent rattling or shaking, the knob 44 is pushed inwardly a sufficient distance to cause the screw head 51 to initially enter the aperture in yoke 53 when a partial clockwise rotation of the knob will cause the screw head to pass through yoke 53 and become seated against the stops 52 in groove 57. The spring 54 naturally takes the strain by compression so as to

retain the window or door 40' in contact with frame 41. A partial rotation of knob 44 in the reverse direction will release screw head 51 from yoke 53 so that it will pass downwardly through the yoke and with the enlarged portion 46, will be withdrawn into hole 47 in member 40 so that this member may be wholly disconnected from the frame 41 in order to allow relative movement of these members with respect to each other.

The invention may be used for fastening such structures as chairs in theaters, schools, ships and railroad cars and obviously other details and modifications of the invention may of course be used, and the invention can be applied not only to cabinets, automobile bodies, airplane fuselages, doors and windows but to other devices and various structures as already intimated among the objects of the invention. Manifestly, variations may be resorted to and features used without departing from the scope of the pending claims.

Variations may of course be resorted to and features used without others.

Hence, having now fully described my invention, I claim:

1. In a locking screw adapted to cooperate with an apertured locking plate having a transverse groove, and including a shank portion surmounted by a head at one end, the feature comprising a reduced portion projecting axially from the other end of said shank portion and serving as bearing means in the aperture of the locking plate when inserted therein, and an integral symmetrical screw means forming a rigid projection upon the end of said reduced portion and adapted to extend entirely through said locking plate in assembled relation of the screw and plate.

2. A locking screw according to claim 1, wherein the integral screw means upon the end of the reduced portion is a rigid head extending radially to two opposite sides as a volute blade and having a greater width than the diameter of said reduced portion so as to have shoulders formed upon the inner ends of said head which are adapted to seat in, and cooperate in locking engagement with the groove in the locking plate.

3. A locking screw according to claim 1, wherein the integral screw means upon the end of the reduced portion is a relatively thin rigid head extending radially to two opposite sides in the form of a thin volute blade and having a greater diameter than that of said reduced portion so as to have shoulders formed upon the inner ends of said head which are adapted to seat in, and cooperate in locking engagement with, the groove in the locking plate.

4. In locking screw means having a resilient apertured locking plate with a transverse groove and a locking screw adapted to cooperate with said locking plate consisting of a shank portion surmounted by a head at one end, the feature comprising a reduced portion projecting axially from the other end of said shank portion and serving as bearing means in the aperture of the locking plate when inserted therein, and an integral screw head rigidly projecting from the end of said reduced portion in the form of a volute plate extending radially in two opposite directions, said head having a greater diameter than that of the reduced portion so as to present shoulders upon the inner end thereof capable of cooperating with and seating in the groove of the locking plate when assembled therewith.

MICHAEL YANESON.