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## WINDOW STAY

05 This invention relates to window stays and in particular to window stays of the type in which opening and closing movement of a window sash is controlled by link means pivotally connected to one of the window sash and window frame and pivotally and slidably connected to a mounting  
10 plate secured to the other of the window sash and window frame.

The sliding connection is usually provided by a shoe located on the mounting plate, for example in a guide track, and most stays have a stop  
15 engageable with the shoe to restrict opening movement of the sash to a ventilation position intermediate the closed and fully opened positions. The known stops comprise a resilient detent which can be released manually to enable  
20 further opening movement of the sash from the ventilation position. A disadvantage of these stops is that they are capable of accidental or unauthorised operation which is undesirable from both safety and security aspects.

25 It is an object of the present invention to provide a stay which overcomes the aforementioned disadvantage.

According to the present invention a window stay comprises an elongate mounting plate adapted  
30 to be secured to one of a window frame and a window sash, link means pivotally and slidably connected to the mounting plate and adapted to be

01 pivotally connected to the other of the window  
frame and window sash, and a locking device  
detachably mounted on the mounting plate to  
restrict sliding movement of the link means, the  
05 device comprising a body having lock means movable  
between a first position in which the lock means  
engages the mounting plate to prevent removal of  
the device from the mounting plate and a second  
position in which the lock means is released to  
10 permit removal of the device from the mounting  
plate.

By the present invention sliding movement of  
the link means is restricted by the locking device  
mounted on and locked to the mounting plate. As a  
15 result, in use, the sash can be opened to a limit  
position determined by the location of the locking  
device on the mounting plate and, to permit  
further sliding movement of the link means to open  
the sash beyond the limit position, the device has  
20 to be unlocked and removed from the mounting  
plate. Consequently accidental or unauthorized  
release of the device such as may occur with the  
known stays incorporating a stop comprising a  
resilient detent is prevented.

25 Preferably the mounting plate and locking  
device are provided with formations to locate the  
locking device longitudinally relative to the  
mounting plate. The formations conveniently  
comprise a lug on the locking device body  
30 engageable in a recess in the mounting plate.

Advantageously, the mounting plate has a  
plurality of longitudinally spaced apart recesses

01 whereby the locking device may be located at any  
one of several positions along the length of the  
mounting plate. In this way a range of limit  
positions for restricting opening movement of the  
05 sash between closed and fully open may be  
provided.

Preferably the mounting plate has a channel-  
section guide track in which the device body is  
received and the or each recess is formed in an  
10 inwardly directed lip of the guide track. This  
arrangement enables the device to be inserted into  
the guide track at the required position but  
prevents sliding movement of the device along the  
guide track.

15 The lock means preferably comprises a rotor  
rotatably mounted in the device body and having  
abutment means which, in the first position of the  
lock means, locates behind the inwardly directed  
lip of the guide track to retain the device in the  
20 guide track.

Preferably the rotor is mounted in a  
transverse slot in the device body and the  
abutment means projects from the device body in  
the first position of the lock means and is  
25 within the device body in the second position of  
the lock means. Consequently the device body can  
be freely inserted into the guide track with the  
lock means in its second position and retained in  
the guide track by rotating the lock means to its  
30 first position. The first and second positions of  
the lock means correspond to rotation of the rotor  
through an angle of  $90^{\circ}$ .

- 01       Conveniently rotation of the rotor is  
effected by a key and means, such as a spring  
washer, is preferably provided to retain the rotor  
in each of the first and second positions. The  
05       rotor and device body are each provided with a  
respective key-hole opening to allow  
insertion/removal of the key and, the key-hole  
openings are aligned with one another in the first  
position of the lock means and are misaligned in  
10       the second position. As a result, when the device  
is mounted in the guide track, the key can only be  
removed when the lock means is in the first  
position, i.e. when the device is locked to the  
guide track. In this way the device cannot be  
15       fitted and the key removed with the device in an  
unlocked condition. Additionally, since the lock  
means cannot be released without the key,  
accidental or unauthorised removal of the fitted  
device is precluded.
- 20       The sliding connection between the link means  
and the mounting plate is provided by a shoe  
located on the guide track which retains and  
guides the shoe for longitudinal sliding movement.  
Conveniently the link means has an arm pivotally  
25       connected at one end to the shoe and adapted to be  
pivotally connected at the other end to the window  
frame or window sash. The link means may include  
one or more further arms extending between and  
pivotally connected to the mounting plate, sash or  
30       an intermediate part of the shoe arm.

01       The locking device may provide the sole means  
for restricting sliding movement of the link means  
and may be fitted or removed as desired.  
Alternatively the stay may include one or more  
05       stops each comprising a resilient detent for  
restricting sliding movement of the link means in  
known manner and the locking device may be fitted  
as required to prevent further sliding movement of  
the link means following accidental or  
10       unauthorised operation of the stop.

The invention will now be described in more  
detail, by way of example only, with reference to  
the accompanying drawings wherein:-

15       FIGURE 1 is a perspective view of a window  
stay according to the present invention;

FIGURE 2 is an exploded perspective view, to  
an enlarged scale, of the locking device of the  
window stay shown in Figure 1; and

20       FIGURES 3 and 4 are perspective views showing  
the installation of the locking device.

Referring first to Figure 1 of the  
accompanying drawings, there is shown a sliding  
shoe stay for adjustable mounting of a window  
sash 1 on a window frame 2. The stay includes an  
25       elongate mounting plate 3 provided with  
countersunk holes (not shown) by means of which it  
may be secured to a stile 4 of the window frame 2  
by screws and, link means 5 pivotally and slidably  
connected to the mounting plate 3 and adapted to  
30       be pivotally connected to the window sash 1 to  
control opening and closing movement of the  
latter.

The mounting plate 3 has a base 6 with two  
edge flanges 7,8 and an intermediate flange 9.

01 Edge flange 8 and intermediate flange 9 define a longitudinally extending channel-section guide track 10 and have inwardly turned lips 11,12 which are parallel to the base 6.

05 The link mean 5 has first and second arms 13 and 14 respectively. The first arm 13 is pivotally connected at one end to a shoe 15 slidably received within the guide track 10 and at the other end to a bracket 16 provided with holes by means of which it may be secured to the window sash 1. The second arm 14 is pivotally connected at one end to a block 17 received within the upper end of the guide track 10 and secured to the mounting plate 3 by one or more screws (not shown) and at the other end to an intermediate part of the first arm.

Usually two stays are provided, one at each side of the window, and opening and closing movement of the sash is controlled in known manner by the sliding action of the shoe in the guide track.

The stay further includes a stop 18 integral with the upper end of the shoe 15 to restrict opening movement of the sash 1 to a limit position e.g. a ventilation position, intermediate the closed and fully opened positions. The stop 18 has a pair of opposed laterally projecting ears 19 respective one ends of which engage the upper ends of a first pair of opposed recesses 20 formed in the lips 11,12 to lock the shoe 15 longitudinally relative to the mounting plate 3 and prevent opening movement of the sash 1 beyond the limit position. The other ends of the ears are tapered as indicated by reference numeral 21 and engage

01 the lower ends of the recesses 20 to lower the  
stop 18 enabling the sash 1 to be closed. To open  
the sash 1 beyond the limit position the stop 18  
is manually released by depressing an actuator 22  
05 connected to the stop 18 to lower the stop 18 and  
disengage the ends of the ears 19 from the  
recesses 20.

In accordance with the present invention, the  
stay is provided with a locking device 23 which  
10 may be mounted on the mounting plate 3 to prevent  
opening movement of the sash 1 beyond the limit  
position when the stop 18 is manually  
released.

The locking device 23, shown in more detail  
15 in Figure 2, comprises a rectangular body 24  
having a pair of opposed laterally projecting  
lugs 25 and a transverse slot 26 in which a  
rotor 27 is mounted. The rotor 27 has a generally  
rectangular head 28 and an annular boss 29  
20 rotatably received within a central opening 30 in  
a closure plate 31 releasably secured to the rear  
face of the body 24. The rotor head 28 has a key-  
hole opening 32 formed therein which aligns with a  
corresponding key-hole opening 33 in the front  
25 face of the body 24 to permit insertion/removal of  
a key 34 when the rotor 27 is in a first position  
in which the ends of the rotor head 28 project to  
either side of the slot 26. The rotor 27 may be  
turned through 90° to a second position in which  
30 the rotor head 28 is entirely within the slot 26.  
by means of the key 34. In the second position  
the key-hole openings 32, 33 are misaligned and  
the key 34 cannot be removed. A spring washer 35

01 mounted on the boss 29 between the closure  
plate 31 and the rear face of the rotor head  
retains the rotor 27 in each of the first and  
second positions.

05 Referring now to Figures 3 and 4,  
installation of the locking device 23 is achieved  
by inserting the key 34 with the rotor head 28 in  
its first position and turning the key 34 to move  
the rotor head 28 to its second position  
10 (Figure 3). The device 23 is then inserted into  
the guide track 10 directly above the stop  
actuator 22 with the lugs 25 locating in a second  
pair of opposed recesses 36 formed in the  
lips 11,12 to lock the device 23 longitudinally  
15 relative to the mounting plate 3. The key 34 is  
then turned to move the rotor head 28 to its  
first position in which the ends of the rotor  
head project to either side of the slot 26 and  
define abutments 37 which locate behind the  
20 lips 11,12 of the guide track 10 to prevent the  
device 23 being removed from the guide track 10  
(Figure 4). The key-hole openings 32,33 are then  
aligned and the key 34 may be removed leaving the  
device 23 positively located and retained in the  
25 guide track 10. As a result, even if the stop  
actuator 22 is depressed to release the stop 18,  
the shoe 15 is prevented from sliding along the  
guide track 10 by the locking device 23 and the  
sash 1 may only be further opened beyond the limit  
30 position by removing the locking device 23 by a  
reverse of the above described installation  
procedure. Since this requires the key 34,  
accidental or unauthorised opening of the sash 1  
beyond the limit position is prevented.

01           It will be appreciated that the invention is  
not restricted to the embodiment above-described,  
for example the mounting plate and shoe may be of  
any construction in which opening and closing  
05 movement of the sash is controlled by relative  
sliding movement therebetween and the link means  
may comprise any number of arms, the articulation  
of which may be varied to provide any desired  
opening action and to suit any particular  
10 application.

The mounting plate may be provided with a  
plurality of positions at which the stop and  
locking device may be located to provide a range  
of limit positions between the closed and fully  
15 opened positions of the sash.

The stop may be omitted in which case the  
locking device itself would act to prevent opening  
movement of the sash beyond the or each limit  
position when installed in the guide track. The  
20 construction of the locking device may be varied  
to suit any construction of mounting plate.

Finally although in the above-described  
embodiment the stay is secured to vertically  
extending parts of the window frame and sash it  
25 will be understood that the stay could be secured  
to horizontally extending parts of the window  
frame and sash. Also the mounting plate could be  
secured to the sash and the link means adapted to  
be pivotally connected to the window frame.



01 Claims:

1. A window stay comprising an elongate mounting plate adapted to be secured to one of a window frame and a window sash, link means pivotally and  
05 slidably connected to the mounting plate and adapted to be pivotally connected to the other of the window frame and window sash, and a locking device detachably mounted on the mounting plate to restrict sliding movement of the link means, the  
10 device comprising a body having lock means movable between a first position in which the lock means engages the mounting plate to prevent removal of the device from the mounting plate and a second position in which the lock means is released to  
15 permit removal of the device from the mounting plate.
2. A window stay according to claim 1 wherein the mounting plate and locking device are provided with formations to locate the locking device  
20 longitudinally relative to the mounting plate.
3. A window stay according to claim 2 wherein the locating formations comprises a lug on the device body engageable in a recess in the mounting plate.
- 25 4. A window stay according to claim 3 wherein the mounting plate is provided with a plurality of longitudinally spaced apart recesses.
5. A window stay according to claim 3 or claim 4 wherein the mounting plate has a channel-section  
30 guide track in which the device body is received and the or each recess is formed in an inwardly directed lip of the guide track.
6. A window stay according to claim 5 wherein the guide track has a pair of opposed inwardly



- 01 directed lips each having one or more recesses  
formed therein and the device body has a pair of  
opposed lugs each engageable in a respective  
recess in the adjacent lip.
- 05 7. A window stay according to claim 5 or claim 6  
wherein the lock means comprises a rotor rotatably  
mounted in the device body and having abutment  
means which, in the first position of the lock  
means, locates behind the lip(s) to retain the  
10 device in the channel-section guide track.
8. A window stay according to claim 7 wherein  
the first and second positions of the lock means  
correspond to rotation of the rotor through 90°.
9. A window stay according to claim 7 or claim 8  
15 wherein the rotor is mounted in a transverse slot  
in the device body and the abutment means projects  
from the slot in the first position of the lock  
means and is within the slot in the second  
position of the lock means.
- 20 10. A window stay according to any one of claims  
7 to 9 wherein the rotor and device body are each  
formed with a respective key-hole opening to allow  
insertion/removal of a key to operate the rotor.
11. A window stay according to claim 10 wherein  
25 the key hole openings are aligned in the first  
position of the lock means and are misaligned in  
the second position of the lock means.
12. A window stay according to any one of  
claims 5 to 11 wherein the link means includes a  
30 shoe slidably mounted in the channel-section guide  
track and an arm pivotally connected to the shoe.
13. A window stay according to claim 12 including  
a stop comprising a resilient detent for  
restricting sliding movement of the shoe.



14. A window stay according to claim 13 wherein the stop is associated with the shoe and is engageable with the guide track to locate the shoe longitudinally relative to the guide track.
15. A window stay according to claim 14 wherein the stop is tapered to disengage the guide track automatically on closing the window.
16. A window stay substantially as hereinbefore described with reference to the accompanying drawings.
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