

[54] **AUTOMATIC LOCKING DEVICE FOR ROLLER BLINDS**

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[22] Filed: **May 2, 1973**

[21] Appl. No.: **356,337**

[57] **ABSTRACT**

[30] **Foreign Application Priority Data**

May 13, 1972 Italy..... 609/72

[52] U.S. Cl. **292/345**, 160/133

[51] Int. Cl. **E05c 1/06**

[58] Field of Search 160/133, 170; 292/345, 292/171, 173

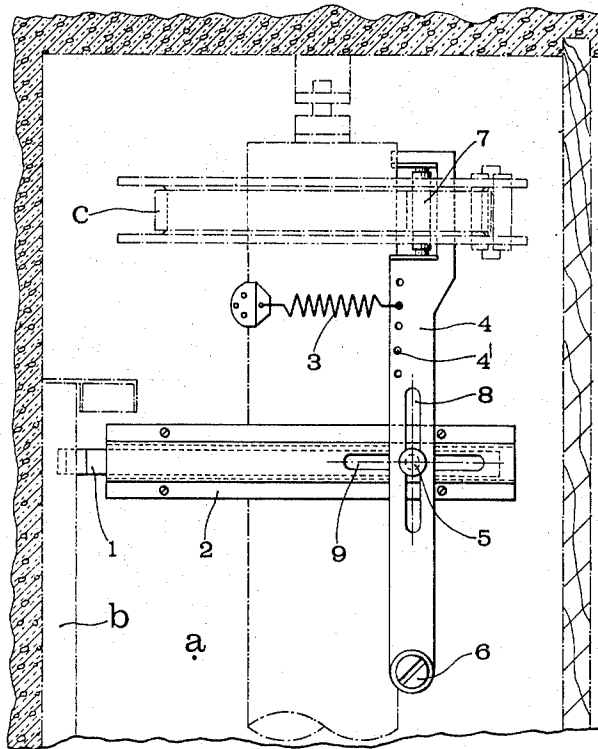
An automatic locking device for roller blinds, comprising a locking bolt movable under the action of a spring into engagement with the roller blind to prevent it from being lifted by burglars and from falling when the belt of the roller blind breaks, movement of said locking bolt being controlled by said belt acting against the pulling force of said spring on a lever connected to said locking bolt and said spring.

[56] **References Cited**

UNITED STATES PATENTS

5 Claims, 3 Drawing Figures

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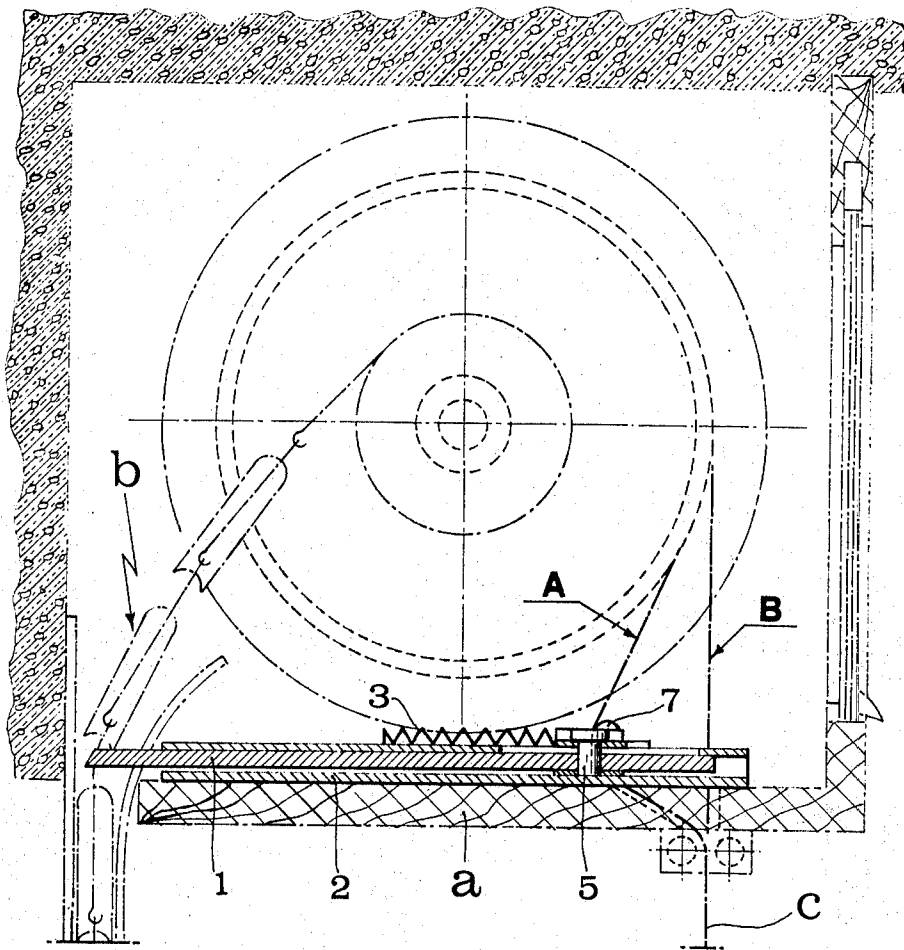


Fig.1

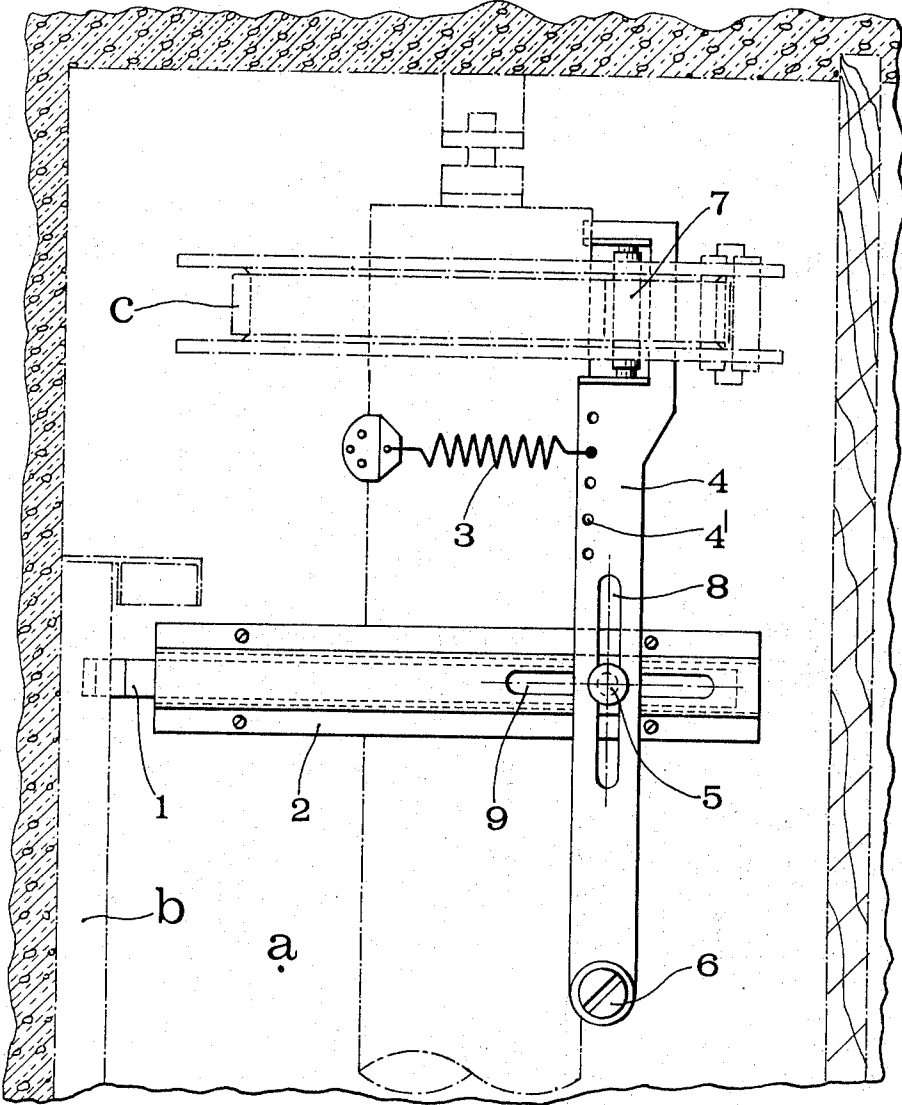


Fig. 2

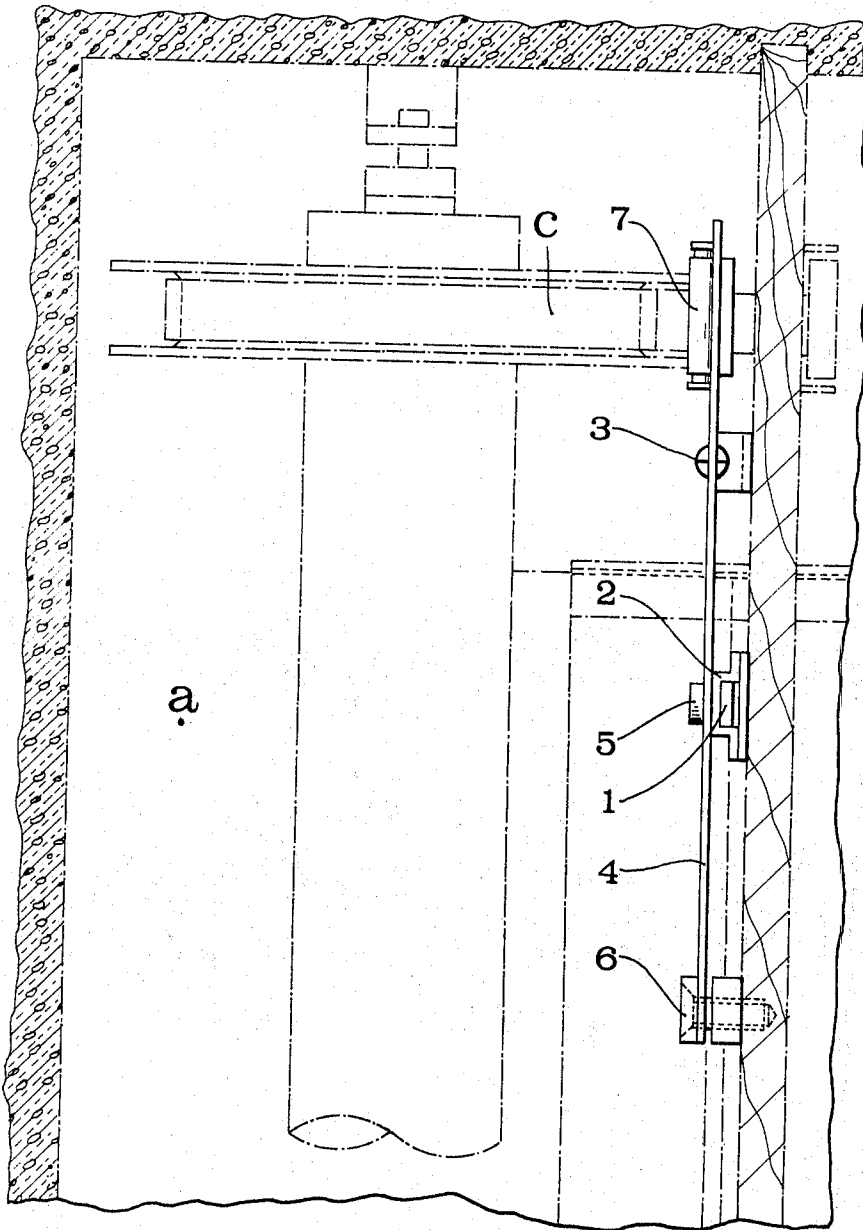


Fig. 3

AUTOMATIC LOCKING DEVICE FOR ROLLER BLINDS

This invention relates to an automatic locking device for roller blinds to prevent them from being lifted from outside by burglars and from falling when the control belt breaks.

Devices for preventing the lifting of roller blinds from outside are already known. These known devices generally comprise a hook which is manually inserted from inside in holes provided near the top of the blind to prevent it from being lifted from outside.

It is an object of the present invention to provide a locking device for roller blinds, which operates automatically and does not have to be inserted manually as the known devices.

This object is achieved according to the present invention by providing an automatic locking device for roller blinds, which comprises a locking bolt mounted horizontally, in a box accommodating a roller blind belt take-up roller, for sliding movement into engagement with the roller blind;

a lever extending generally perpendicularly to said locking bolt and pivotally connected intermediately of its length to said locking bolt and with one of its ends to said box;

a roller mounted for free idling rotation at the end of said lever opposed to said pivotally connected end thereof, said roller being movable into engagement with said roller blind belt; and

a spring having one end thereof secured to said box and the other end to said lever in a position between said roller and said pivotal connection to said locking bolt to normally urge the latter into a roller blind engaging position.

In this manner the locking bolt is so connected to the roller blind belt that the locking bolt can only be released from inside the room where the device is mounted, by actuation of the roller blind control belt, and actuation of the locking device is effected automatically by pulling or releasing the roller blind control belt when the roller blind is to be lifted or lowered.

When the roller blind is closed the locking bolt of the locking device is pushed against the roller blind and penetrates into the gaps existing between the slats of the roller blind or into holes provided therein for this purpose and thus the roller blind is blocked and cannot be moved. Thus the locking device operates automatically in that the locking bolt automatically assumes its locked position when the roller blind is closed and the locking bolt is released as soon as the roller blind belt is pulled in the usual operations of lifting or lowering the roller blind.

A preferred embodiment of the invention will now be described by way of example and with reference to the accompanying drawings, in which:

FIG. 1 is a transverse section through a box containing a roller blind belt take-up roller with an automatic locking device as proposed according to the present invention, the locking device being shown in longitudinal section;

FIG. 2 is a plan view of the locking device, and

FIG. 3 is a side view of the locking device.

Referring to the drawings, a locking bolt 1 is horizontally slidably mounted in a sleeve 2 in a box *a* accommodating a take-up roller for a control belt *c* of a roller blind *b* which is formed of a plurality of individ-

ual horizontal slats with gaps therebetween into which the locking bolt 1 can be inserted. As shown more particularly in FIG. 2, a lever 4 is arranged perpendicularly to the locking bolt 1 and connected thereto by a pivot 5, one end of the lever 4 being swingably connected by means of a pivot 6 to the box *a* and the other end being provided with a yoke supporting a roller 7 for free idling movement therein, the roller 7 engaging the belt *c*. A spring 3 has one end thereof secured to the box *c* and the other end to the lever 4 where it can be selectively fixed in any one of a plurality of holes 4' to vary the force of the spring 3. The spring 3 thus biases the lever 4 to swing about the pivot 6 and causes movement of the locking bolt 1 in the sleeve 2 toward and into engagement with one of the gaps between the slats of the roller blind *b*. The pivot 5 is firmly secured to the locking bolt 1 and received in slots 8 and 9 provided in the lever 4 and sleeve 2, respectively, to permit relative movement between the locking bolt 1 and the lever 4.

The operation of the locking device is as follows:

When the roller blind *b* is closed the locking bolt 1 is urged by the pivot 5 toward the roller blind by the action of the lever 4 which is swingable about the pivot 6 as it is being pulled by the spring 3. So the free end of the locking bolt 1 can penetrate into a gap between a pair of slats of the roller blind *b*, as shown in FIG. 1. In this position the locking bolt 1 prevents any movement of the roller blind *b* except by means of the control belt *c*. However, when the control belt *c* is pulled it will urge against the rotatable roller 7 of the lever 4 and return the latter against the action of the spring 3 to thereby withdraw the locking bolt 1 and release the roller blind.

This action of the belt *c* on the roller 7 is made possible by the particular arrangement of the belt *c* which, as shown in FIG. 1, assumes the position A when the roller blind is closed, but when the belt *c* is pulled it will assume the position B. The belt *c* is pulled, i.e., under tension, both when the roller blind *b* is lifted and when it is lowered as in both cases the belt *c* is tensioned by the weight of the roller blind *b*.

Should the roller blind be lifted from outside in its closed or half-closed position the belt *c* would be released and the spring 3 would pull the locking bolt 1 into its locking position as the force of the spring 3 is so chosen that it will largely exceed the small return force exerted by the roller blind *b*.

The same thing happens when the belt *c* should break during operation as frequently occurs. In this case the lever 4 is no longer under the control of the belt *c* and causes immediate locking of the roller blind before it can move rapidly downwardly under its own weight and can cause damage to its component parts and injury to persons.

It is very important to adequately select the return force exerted by the spring 3 on the locking bolt 1 to compensate the various forces acting in the entire device. For this purpose the force of the spring 3 can be adjusted by varying its position of engagement in the holes 4' in the lever 4.

In the closed position of the roller blind there will conveniently be provided large holes between the slats thereof to facilitate the insertion of the locking bolt 1. To lock the roller blind in an intermediate position it will, on the other hand, be sufficient to allow the lock-

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ing bolt to engage the unevennesses on and between the slats of the roller blind.

When the locking device is installed on a roller blind it is not visible neither from within the room where it is mounted nor from outside so that it is also difficult to tamper with the device.

The locking bolt 1 and the lever 4 may also be formed integrally. Further, by appropriately changing the position of the locking bolt 1 the latter may also be directly controlled by the belt c without the interposition of the lever 4.

Although a preferred embodiment of the invention has been described herein in detail and illustrated in the accompanying drawings it is to be understood that the invention is not limited to this precise embodiment and that numerous changes and modifications obvious to one skilled in the art may be made therein without departing from the scope of the invention.

I claim:

1. An automatic locking device for roller blinds, comprising a locking bolt mounted horizontally, in a box accommodating a roller blind belt take up roller, for sliding movement into engagement with the roller blind; a lever extending generally perpendicularly to said locking bolt and pivotally connected intermediately of its length to said locking bolt and with one of its ends to said box; a roller mounted for free idling rotation at the end of said lever opposed to said pivotally

connected end thereof, said roller being movable into engagement with said roller blind belt; and a spring having one end thereof secured to said box and the other end to said lever in a position between said roller and said pivotal connection to said locking bolt to normally urge the latter into a roller blind engaging position.

2. An automatic locking device as claimed in claim 1, wherein said locking bolt is mounted for longitudinal sliding movement in a sleeve and a pivot is firmly secured to and extends perpendicularly from said locking bolt through a slot in said sleeve and a slot in said lever to provide for pivotal connection between said locking bolt and said lever.

3. An automatic locking device as claimed in claim 1, wherein said roller is freely rotatably mounted in a yoke at the end of said lever.

4. An automatic locking device as claimed in claim 1, wherein said spring is arranged to urge said locking bolt into engagement with a gap between a pair of slats of said roller blind when said roller blind belt is released, said spring being arranged to be tensioned when said roller blind belt is pulled to disengage said locking bolt from said roller blind.

5. An automatic locking device as claimed in claim 1, wherein said locking bolt and said lever are formed integrally.

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