March 2, 1937. H. J. MACKIN 2,072,269

LATCH

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Fig. 1.

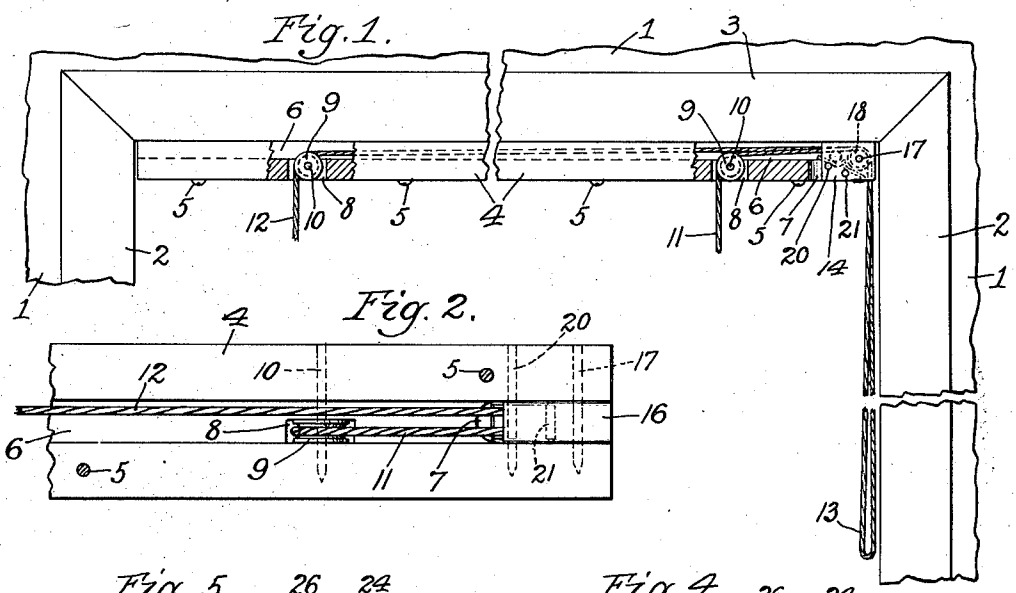


Fig. 2.

Fig. 5.

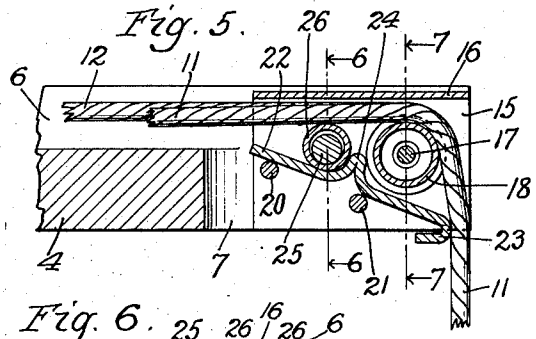


Fig. 4.

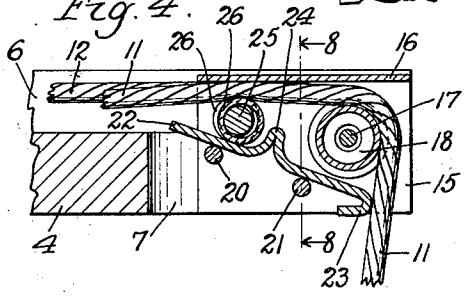
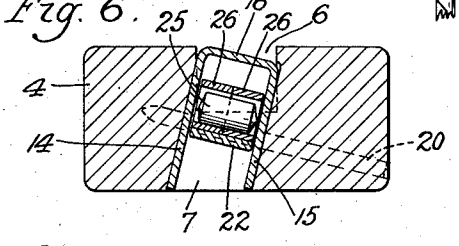


Fig. 6.



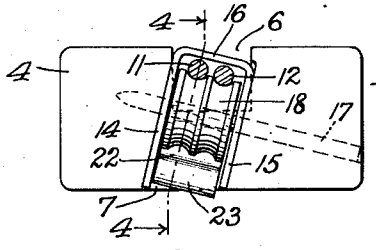
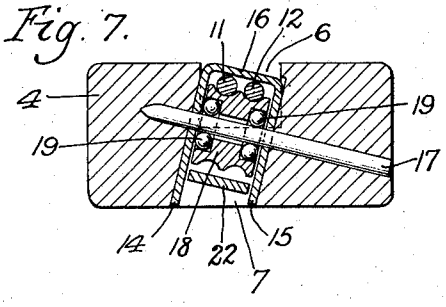


Fig. 3

Fig. 7.



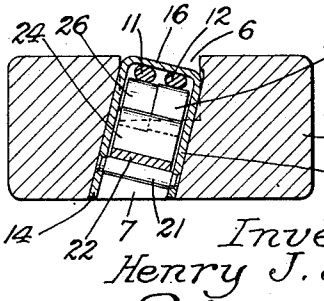


Fig. 8.

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Fig. 9.

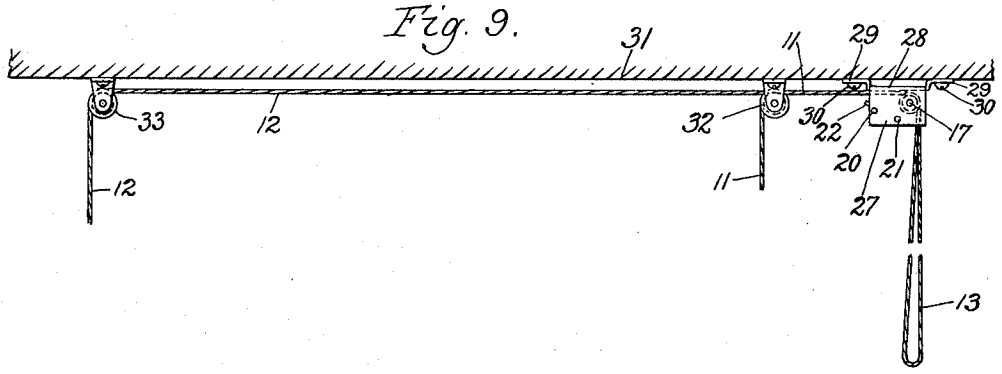


Fig. 10.

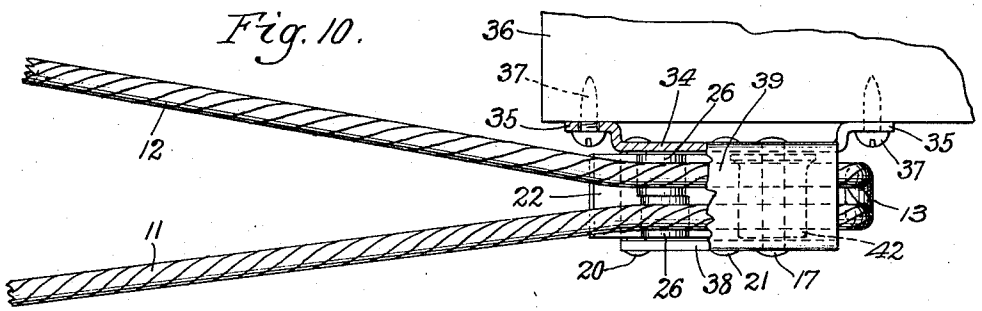


Fig. 11.

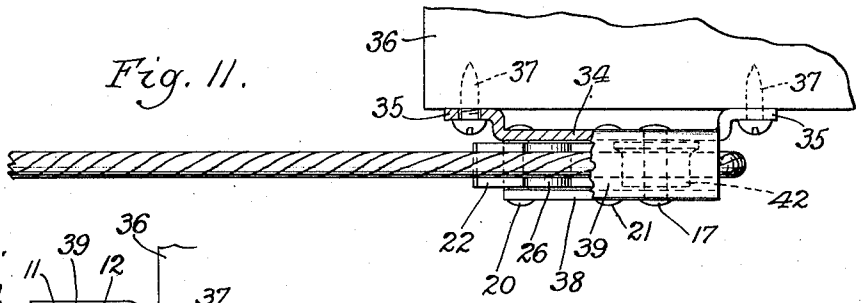
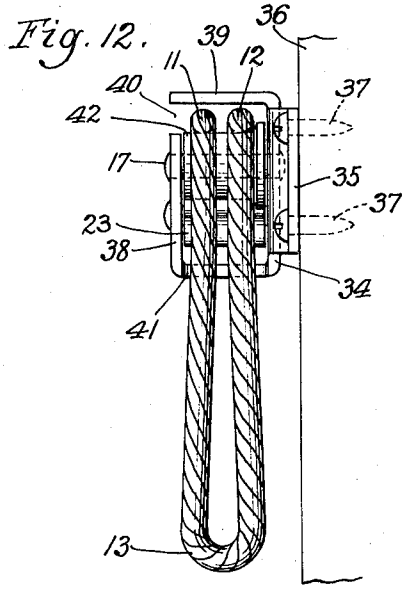


Fig. 12.



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UNITED STATES PATENT OFFICE

2,072,269

LATCH

Henry J. Mackin, Kankakee, Ill.

Application January 10, 1936, Serial No. 58,451

14 Claims. (Cl. 156—17)

This invention relates to a latch or lock for engaging a cord, cable or similar member and for securing, latching or locking it into position.

It has for one object to provide a device which will readily prevent undesired reversing movement of a cable or cord, which may be moved easily into locking or unlocking position.

Another object is to provide such a device which is operated by movement of the cord itself in the hands of an operator. Another object is to provide in a device of the general type suggested a positive means for moving the locking members toward the locking position in response to movement of the cord in the hand of an operator.

The invention is illustrated herewith as applied to a Venetian blind and as applied to a blind of another sort. It may be used in almost any position and in connection with almost any cord, cable or similar member, whether the latter is used to control a blind or to control or support any other device.

The invention is illustrated more or less diagrammatically in the accompanying drawings, wherein:—

Figure 1 is a side elevation of a portion of a window with the latch of the present invention associated with an upper support for a blind;

Figure 2 is a top plan view of the upper support or "rail" of the blind shown in Figure 1 on an enlarged scale;

Figure 3 is an end view of the member shown in Figure 2 with the cords in section;

Figure 4 is a transverse generally vertical sectional detail taken at line 4—4 of Figure 3;

Figure 5 is a view generally similar to Figure 4, showing the parts in a different position of adjustment;

Figure 6 is a transverse vertical sectional detail, taken at line 6—6 of Figure 5;

Figure 7 is a transverse vertical sectional detail taken at line 7—7 of Figure 5;

Figure 8 is a transverse vertical sectional detail taken at line 8—8 of Figure 4;

Figure 9 is a view showing the lock in position on a support from which it extends downwardly and is arranged to engage a cable or cord which may be used to raise and support any desired article;

Figure 10 is a top plan view with parts broken away and parts in section, showing a modified form of the device secured to a generally vertical surface such as a wall;

Figure 11 is a top plan view generally similar to Figure 10, showing a form of the device suitable for use with a single cord;

Figure 12 is an end view of the device shown in Figure 10.

Like parts are designated by like characters throughout the specification and drawings.

As shown in Figure 1, the lock is applied to a support for a blind which is positioned in an opening such as a window or doorway, the blind being secured to a portion of the window or door frame above it. Obviously the lock may be associated with a mechanism other than a blind and the blind might be supported differently.

1 indicates a wall. 2 are the vertical frame members of the window and 3 is a horizontal frame member to which a "rail" 4 is secured by screws 5 or otherwise. The "rail" is preferably channeled in its upper surface as at 6 to provide a passage or enclosure for the cord or cords. The rail is cut away adjacent one end and preferably in register with the channeled portion 6 as at 7. This cut away portion or cavity 7 receives the lock and for convenience of operation the lock may be tilted to the side. To permit this the cut away portion 7 is tilted to the side as shown particularly in Figures 3, 6, 7 and 8. The rail is also provided with one or more perforations or cut away portions 8 within or adjacent each of which a grooved pulley 9 is positioned on a suitable bearing member 10, the pulleys being out of alignment with each other so that each can accommodate a different cord or a different portion of the same cord. Thus a cord member 11 passes over the right hand pulley 9 as shown in Figure 1, and a cord portion 12 passes over the left hand pulley 9 as shown in Figure 1. These cord portions may be joined together at their ends to form a loop 13 as shown in Figure 1, or they may actually be separate from each other.

The lock or latch comprises a housing which preferably has generally parallel side walls 14 and 15, joined by a top 16. If the device is to be associated in a blind support, as shown in Figures 1 to 8, inclusive, in which it is tilted slightly to the side, the wall 14 may be somewhat longer than the wall 15. This is not an essential feature of the invention but is a mere matter of convenience, depending upon the association in which the lock is to be used.

Where the lock is to be associated with a blind support or with some other supporting member, it may be convenient to use members for attaching the lock to the support, which members also serve in the assembly of the lock itself, either

to hold parts in position or to act as a bearing or otherwise to perform a function in the lock itself in addition to the function of fastening the lock to the support. Thus the member 17 serves to hold the lock in place and serves also as a bearing for the double grooved roller 18. This roller may be provided with suitable ball races on its sides to receive balls or other anti-friction members 19 which contact with the pin 17 and so provide an anti-friction bearing for the roller.

The pin 20 serves to secure the lock to the support and acts as a positioning member to position a portion of the locking mechanism which will be described below. A short rivet 21 may be positioned intermediate the pins 17 and 20 and in this case is riveted directly to the walls of the lock housing and does not extend appreciably beyond them. It serves also as a fastening and positioning member.

Loosely positioned within the housing of the lock and above the pins 20 and 21, and resting upon them, is a setter member 22. This member, adjacent one end, rests upon the pin 20 and at its opposite end is curved or rounded as at 23. The purpose of this shape is to avoid wear on the cord or cable and another shape might be adapted without departing from the spirit of the invention. Intermediate its ends the setter 22 is provided with a raised portion 24. Resting upon the member 22 and limited as to its lowermost position by the raised portion 24 is a composite locking member which comprises a short roller or shaft 25 upon which are loosely fitted two rings or rollers 26, 26. The degree of looseness of fit is such that one ring or roller may move ahead of the other or they may, of course, move together. This permits independent locking and compensates for differences in size of the cord or cable members which may be due to a variety of causes, including uneven wear. Thus in Figure 4 the parts are shown in the locking position and it will be noticed that one of the rollers or rings 26 is ahead of the other. Figure 8 shows a section of the same parts in the same position and it will be noticed that the right hand member 26 has its upper surface above that of the left hand member 26. This is made necessary because the cord section 12 is thinner than the cord section 11. It is one of the purposes of the present invention and of the construction just described to compensate for unevenness, in wear or size, and to permit independent locking of the separate cord sections. If the rings 26 were not independent, only the larger cord section 11 would be locked because when that has been locked further movement of the roller in the locking direction is impossible and the member 12 would not be locked.

The modified form shown in Figure 9 does not include a "rail" or other similar member. A housing formed of side members 27, 27 and a top member 28 encloses the locking mechanism, which is identical with that just described in connection with Figures 1 to 8, inclusive. The housing is provided with feet 29 which may be secured by screws 30 or otherwise to a roof or other support 31. Independently mounted rollers 32, 33 are provided to support, respectively, the cord sections 11 and 12. Except for these differences and for the fact that the members 17, 20 and 21, act only as retaining and bearing members in the lock, the details of the lock construction and operation are the same as those described above.

As shown in Figures 10 and 12, a further modification appears in which the device is arranged for attachment to a side wall or side support. As shown there is a side housing member 34 upon which feet 35 are formed which contact a wall 36 and are secured thereto by screws 37 or otherwise. 38 is the opposite side housing member and 39 is a top member which covers the lock but is separated from the side wall as at 40 to provide a side opening through which the cable or cord may be inserted. A bottom housing member 41 joins the two side sections. In this form of the device the operating and locking mechanism is the same as that described above except that instead of the double grooved roller 18 a smooth roller 42 is provided. This roller is so made in order to permit free side entrance and side removal of the cord or cable.

In Figure 11 a device identical with that in Figures 10 and 12 is shown except that it is adapted for locking a single cord and, therefore, is narrower.

In the form shown in Figures 10, 11 and 12, the device is adapted for use with a cord or cable for any purpose. No blind or other similar or analogous device is shown but it is assumed that the lock is used with a single or double cord or cable which has one reach normally under tension and the other reach normally not under tension. The locking means is effective to lock the reach under tension in a desired position and it may be unlocked at the will of the operator.

The use and operation of the invention are as follows:

Considering the parts in the position shown in Figure 5, they are unlocked. The setter member 22 has moved to the right until the projection or raised portion 24 contacts the roller 18 which limits its movement to the right and prevents its falling from the assembly. The locking member 25 with the rollers or rings 26 lies in its lowermost position resting upon the setter 22 and against the raised portion 24.

If with the parts in the position shown in Figure 5 it is desired to lock them, assuming, for example, that a blind with which the lock is associated is to be raised, the blind is raised by pulling upon the cables 11 and 12 and they move downwardly. When the blind or other object supported by the cables has been moved to the desired position, the operator moves his hand so as to move the cable sections below the roller 18 to the left. They occupy this position in Figure 4 and it will be seen that they have been moved to the left from the position of Figure 5. When this movement occurs the cords bear against the curved or outer end 23 of the setter 22 and carry that member and the locking rollers or rings 26 to the right so that these locking members are brought into contact with the under sides of the cord sections 11 and 12 and engage them frictionally. If the operator now permits the cords to run out slightly to the left, since they are in frictional engagement with the rings 26, these rings will be carried upwardly along the upper inclined portion of the setter member 22 and will wedge and lock the rope or cord sections against the top housing member 16 and a very slight movement to the right is sufficient to effect a locking. The parts are shown in the locked position in Figure 4.

To effect an unlocking and to permit lowering of the blind or other object supported by the cords, the operator pulls downwardly on that portion of the cords which is beyond and below the roller 18. This causes reverse rotation and

movement of the locking rings 26, frees them from frictional engagement with the cord sections 11 and 12 and permits them to roll backward along the setter until they again contact the raised part 24. When this has occurred the operator holding the cord in a position to the right of that shown in Figure 4, may permit the cord to run out and so lower the blind. So long as the cord is held in such a position that it does not move the setter to the left sufficiently to bring the rollers 26 in frictional engagement with the cord sections, no locking will occur.

As above pointed out the locking members 26, although carried on the same shaft member 25, are loose with respect to it and are separate from each other so that one may move farther from the other. Thus one may move farther upwardly along the inclined surface of the setter 22 and may move to conform to a cable of different size or shape. Hence completely independent locking can occur. This is shown to have occurred both in Figures 4 and 8 in which the member 26, which engages the rope section 12, has moved farther upwardly than the member 26 which engages the rope 11. These figures indicate merely one typical condition in which for some reason or other cords or sections of the same cord are not of the same thickness. This may occur from uneven wear or from a variety of causes and the device of the present invention provides automatic means whereby effective locking occurs independently of this variation in size or shape of the cords.

The operation of the locking mechanism in the form shown in Figure 9 is the same as that just described. This form is shown to illustrate the fact that the present lock need not be associated with a "rail" or any other part of a blind but can be used separately. In Figures 10, 11 and 12 the operation of the locking means is the same as that described. The form of these figures involves no essential association with pulleys or other members.

The rings or locking members 26, as shown, are smooth and not knurled or otherwise roughened. Although my invention is not limited to the use of smooth rollers I am able to get an entirely satisfactory locking or latching effect with smooth rollers and thus I avoid the wear and tear on cords which has heretofore occurred in connection with the knurled and roughened rollers which have been almost universally used. The setter member is effective to move the smooth rollers into initial or incipient engaging contact with the cords, and subsequent reverse movement of the cords effects the locking.

I claim:

1. In a fastener, a housing, a cord guiding part, a loosely mounted locking member positioned within said housing, a setter member, adapted to be moved bodily to carry the locking member into cord-engaging position, and a cord portion extending through said housing, engaging said guide, said cord portion moving said setter into position to move said locking member into position to engage said cord.

2. In a fastener, a housing, a cord guiding part, a loosely mounted rotary locking member positioned within said housing, a setter member, adapted to be moved bodily to carry the locking member into cord-engaging position, and a cord portion extending through said housing, engaging said guide, said cord portion moving said setter into position to move said locking member into position to engage said cord.

3. In a fastener, a housing, a cord guiding part, a loosely mounted locking member positioned within said housing, a setter member supporting said locking member, adapted to be moved bodily to carry the locking member into cord-engaging position, and a cord portion extending through said housing, engaging said guide, said cord portion moving said setter into position to move said locking member into position to engage said cord.

4. In a fastener, a housing, a cord guiding part, a loosely mounted rotary locking member positioned within said housing, a setter member supporting said locking member, adapted to be moved bodily to carry the locking member into cord-engaging position, and a plurality of cord portions extending through said housing, engaging said guide, said cord portions moving said setter into position to move said locking member into position to engage said cords.

5. In a fastener, a housing, a double grooved cord guiding roller, a loosely mounted rotary locking member positioned within said housing, a setter member supporting said locking member, adapted to be moved bodily to carry the locking member into cord-engaging position, and a plurality of cord portions extending through said housing, engaging said grooved roller, said cord portions moving said setter into position to move said locking member into position to engage said cords.

6. A fastener for fastening a cord and the like, comprising a housing, a pulley for guiding said cord, a cord passing through said housing and having one reach normally slack and one reach normally under tension, and a locking member comprising a setter mounted to be moved by the slack reach of the cord, and a plurality of independent cord locking members, said members joined together for relative movement and associated with said setter.

7. A fastener for fastening a cord and the like, comprising a housing, a pulley for guiding said cord, a cord passing through said housing and having one reach normally slack and one reach normally under tension, and a locking member comprising a setter mounted to be moved by the slack reach of the cord, and a plurality of independent cord locking members, said members joined together for relative movement and associated with said setter, the setter mounted to be moved by the slack reach of the cord to carry said locking members into cord engaging position.

8. A fastener for fastening a cord and the like, comprising a housing, a pulley for guiding said cord, a cord passing through said housing and having one reach normally slack and one reach normally under tension, and a locking member comprising a setter mounted to be moved by the slack reach of the cord, and a plurality of independent cord locking members, said members joined together for relative movement and associated with said setter, the setter adapted to carry said locking members into cord engaging position, movement of the cord thereafter automatically moving said locking members to lock each cord independently.

9. A fastener for fastening a cord and the like, comprising a housing, a pulley for guiding said cord, a cord passing through said housing and having one reach normally slack and one reach normally under tension, and a locking member comprising a setter mounted to be moved by the slack reach of the cord, and a plurality of rotary

independent cord locking members, said members joined together for relative movement and associated with said setter.

10. A fastener for fastening cords and the like, comprising a housing, a pulley for guiding said cords, cords passing through said housing and having one reach normally slack and one reach normally under tension, and a locking member comprising a setter mounted to be moved by the slack reach of the cords, and a plurality of rotary independent cord locking members, said members joined together for relative movement and associated with said setter, the setter adapted to carry said locking members into cord engaging position, movement of the cords thereafter automatically moving said locking members to lock each cord independently.

11. As a blind supporting and positioning means, a fastener, comprising movable means for locking a cord, and a means for initiating the movement of said locking means, said fastener comprising a plurality of relatively movable parts, means for securing the fastener to said support, said securing means serving also to position and fasten together the parts of said fastener.

12. As a blind supporting and positioning means, a fastener, comprising movable means for locking a plurality of cords of different sizes, and a single means for initiating the movement of said locking means, said fastener comprising a plurality of relatively movable parts, means for securing the fastener to said support, said securing means serving also to position and fasten together the parts of said fastener.

13. As a blind supporting and positioning means, a fastener, comprising independent movable means for locking a plurality of cords of different sizes, and a single means for initiating the movement of said locking means, said fastener comprising a plurality of relatively movable parts, means for securing the fastener to said support, said securing means serving also to position and fasten together the parts of said fastener.

14. As a blind supporting and positioning means, a fastener, comprising independent movable means for locking a plurality of cords of different sizes, and a single means for initiating the movement of said locking means, said fastener comprising a plurality of relatively movable parts, means for securing the fastener to said support, said securing means serving also to position and fasten together the parts of said fastener, and to furnish bearings for said movable parts.

HENRY J. MACKIN.