March 21, 1933. L. V. BLUE 1,902,392

AUTOMATIC CLOSER FOR WINDOWS AND THE LIKE

Filed July 12, 1927

FIG. 1.

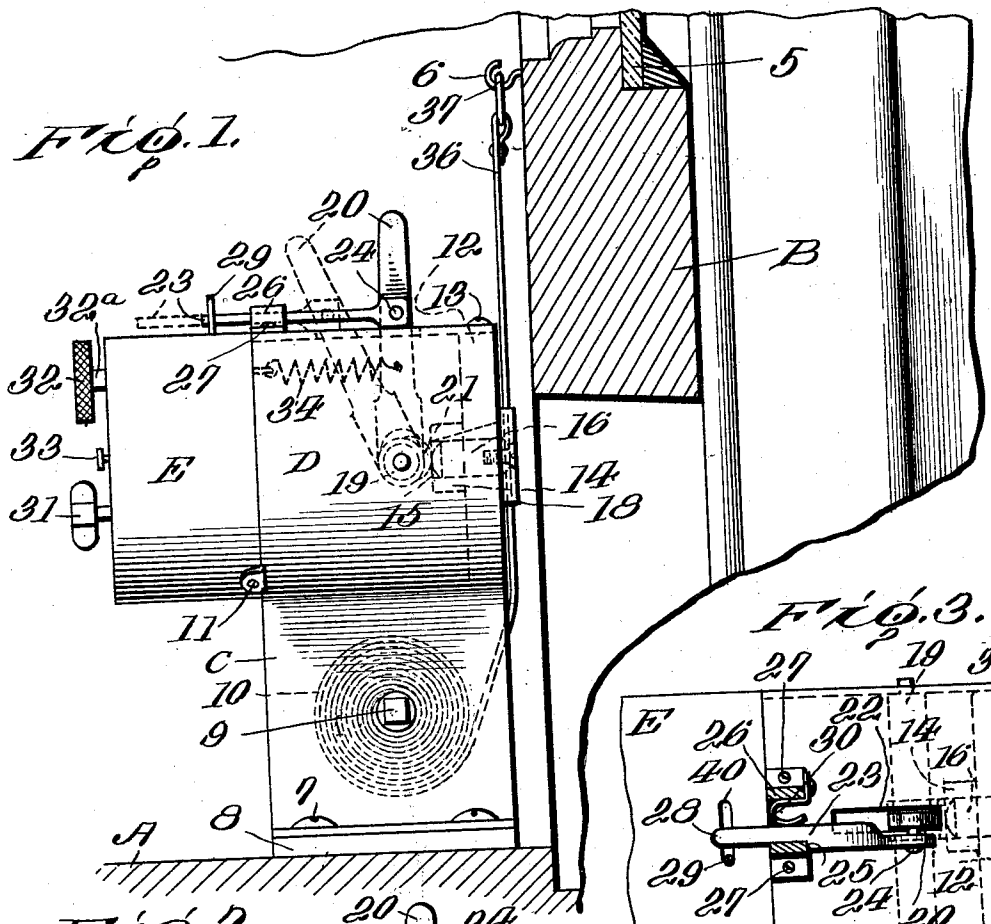



FIG. 3.




FIG. 2.

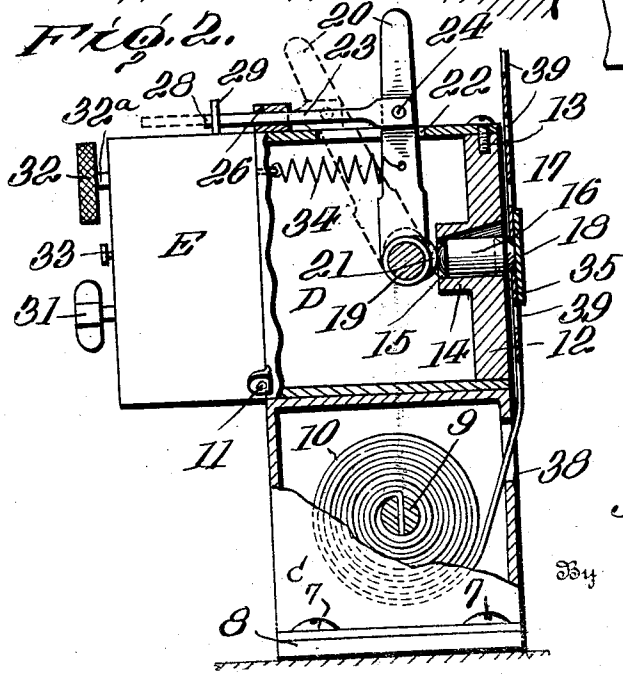
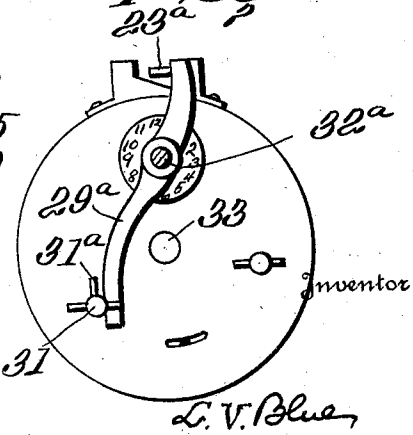



FIG. 4.

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# UNITED STATES PATENT OFFICE

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## AUTOMATIC CLOSER FOR WINDOWS AND THE LIKE

Application filed July 12, 1927. Serial No. 205,204.

This invention relates to improvements in automatic closers for windows and the like the invention being directed to and comprising specifically a clock operated automatic closer for windows or for automatically operating such other devices as come within the construction hereinafter described.

The primary object of the invention is to provide a device of the character described for automatically closing a window at any given or predetermined time.

A further object of the invention is the provision of a device of the character described having incorporated therein novel features of construction which will be more specifically pointed out in the following description taken in conjunction with the accompanying drawing.

In the drawing:

Figure 1 is a view in side elevation of the improved automatic window closing device, the device being shown attached to a window sill and in conjunction with a window.

Figure 2 is a view in side elevation, the view being partially broken away to show the device in vertical section.

Figure 3 is a top plan view of the device.

Figure 4 is an end view showing a modified form of trip.

As is well known, it is a common practice to open windows in rooms, particularly bedrooms, before retiring at night, and devices of varying constructions for automatically closing the window have appeared in patents from time to time and have otherwise been brought to the general notice of the public. However so far as I am aware, none of these devices have come into general use.

One reason for the lack of general use of these devices is thought to be that their construction is too complicated and their sale price too high. The present invention having accomplished the desired result, is quite simple in nature and is cheap to manufacture.

Referring now to the drawing which illustrates a preferred embodiment of the invention, A designates a window sill and B a bottom frame or sash of a window carrying a usual glass or pane 5. The window sash at its inner side is provided with a hook 6 or some equivalent thereof, the specific purpose of which will be hereinafter pointed out.

By reference to the several figures of the drawing it will be seen that the automatic closer comprises a box or housing C which is attached to the window sill by suitable screws 7 or the like, said screws passing through a flange B provided at the sides of the base of the box. A shaft 9 extends transverse the box and carries a spring 10. The construction is such that the spring can be put under tension by revolving the shaft 9 by any suitable and common means such as a key.

Superimposed upon the spring box and preferably rigidly attached thereto, is a housing D to which is attached a clock E by means of brackets 11. This housing D has a thickened front face or wall 12 which is held in place by suitable screws 13 so that this end of the housing can be removed if desired. Centrally of the inner side of the end wall 12 is an inwardly extending thickened portion 14. The thickened portion 14 and the front wall of the housing is provided with a bore 15 in which is slidably mounted a trigger pin 16. The inner end of this trigger pin is rounded as at 17 while the outer end of the pin tapers down to a point 18.

Positioned transverse the housing D and in back of the trigger pin is a shaft 19 carrying an eccentric rod 20, the lower end of which is provided with an eccentric or cam 21 which engages the rounded inner end of the trigger pin. The upper end of the rod 20 extends through a suitable opening 22 in the top of the housing and one end of the lock bar 23 is pivotally fastened as at 24 to this lever. The lock bar throughout a greater portion of its length is flat and intermediate its length is provided with an inset forming a shoulder 25. This lock bar extends through a guide 26 which is fastened as at 27 adjacent the rear end of the top of the housing D. The extreme outer

end 28 of the lock bar is engaged by the rod 29 of the clock E.

The guide 26 is much wider than the lock bar 23 and is provided with a spring 30, the normal tension of which is such as to hold the lock bar 23 in engagement with the right hand side of the guide. The rod 29 extending through the top side of the clock housing normally carries the clapper which sounds against the alarm bell of the clock. It will be readily understood that the clapper and the alarm bell have been removed from the clock.

The clock is of the common construction and is provided with the usual winding handle 31 and the setting handle 32. The time for the sounding of the alarm is set by the handle 33.

The normal position of the eccentric lever 20 is shown in dotted lines in Figures 1 and 2 of the drawing. The eccentric lever is held in this position by reason of the coil spring 34 which exerts a normal tension to pull this lever toward the clock.

Positioned on the outer face of the front or end wall 12 of the housing D and in line with the bore 15 carrying the trigger pin is a guide 35. The free end 36 of the spring 10 is provided with a ring 37 and the free end of the spring passes outwardly through the opening 38 in the front wall of the spring box C passing upwardly through the guide 35 and is attached to the window sash B by hooking the ring 37 over the hook 6. The spring is further provided, adjacent its free end, with a series of holes or openings 39 which holes are adapted to receive and be engaged by the tapered outer end 18 of the trigger pin.

*Operation*

In the use of the device, the free end 36 of the spring is attached to the window sash and the window raised to the desired height. The raising of the window will automatically increase the tension of the spring 10 upon its shaft 9.

When the window is positioned at the desired height, the eccentric lever 20 is grasped and manually pushed forward against the tension of the coil spring 34 to the position shown in full lines in Figures 1 and 2 of the drawing. The lever will remain in this forward position due to the fact that the spring 30 in the guide 26 will push the lock bar to the right and cause the shoulder 25 of the lock bar to engage the front face of the guide, as clearly appears in Figure 3 of the drawing. With the forward movement of the eccentric lever 20, the eccentric 21 has engaged the rounded inner end of the trigger pin and forced the trigger pin outwardly so that its tapered outer end 18 is moved into engagement with one of the holes 39 in the spring, thus neutralizing the downward pull of the spring 10 and preventing the spring from pulling the window downwardly.

The alarm clock, having been wound, is now set so that the alarm mechanism will be released at the time it is desired that the window be closed.

When the time is reached for the sounding and release of the alarm mechanism of the clack, the rod 29 of the alarm mechanism will move or oscillate throughout the length of the groove 40, Figure 3 of the drawing, thus pushing the lock bar 23 to the left against the tension of the spring 30. Upon the movement of the lock bar to the left, the shoulder 25 of the lock bar is carried out of engagement with the face of the guide and the eccentric lever 20 is pulled rearwardly by the tension of the coil spring 34 to the position shown in dotted lines in Figures 1 and 2 of the drawing.

The rearward movement of the eccentric lever swings the eccentric 21 upwardly out of engagement of the rounded inner end 17 of the trigger pin and the trigger pin is accordingly free to move inwardly.

As the outer end of the trigger pin which is in engagement with the openings in the spring is tapered, the downward pull of the spring working against this tapered end, pushes the trigger pin inwardly out of engagement with the openings 39 and permits the spring 10 to pull the window downwardly to a closed position.

From the foregoing it will be seen that the operation of the device is automatic after the window had once been raised and the eccentric lever carried forward by manual operation.

It will be additionally seen that although it is necessary to wind the clock from time to time, that once the tension has been put upon the spring 10, this operation will not again be necessary as the tension is automatically increased by the raising of the window and the consequent upward pull upon the spring.

By reference to Figure 2, it will be seen that the bore 15, in which the trigger pin is slidably mounted, is enlarged and tapered upwardly at its outer end. With this construction it is possible to position the trigger in locking position prior to raising the window. When the window is raised and the spring 10 pulled upwardly the openings in the spring will carry the outer end of the trigger pin upwardly in the tapered outer end of the bore 15, thus automatically releasing the outward projection of the pin and permitting the spring to pass freely. However, when the window goes down slightly to a point where there is a hole in the spring, this hole in engaged by the trigger pin and the trigger pin carried downwardly which

causes it to move into a locked position as shown in full lines in Figure 2.

By reference to Figure 4, a modified form of tripping mechanism is illustrated. It will be seen that a propeller-shaped lever $29^a$ is rotatably supported upon the shaft $32^a$ of the setting handle 32, and that the upper end of this lever engages the elongated end $23^a$ of the lock-bar 23. The lower end of the lever $29^a$ is positioned adjacent the alarm winding handle 31 and is adapted to be engaged by the projecting arm $31^a$ carried by the alarm winder.

As is well understood, the handle 31 of the alarm winder rotates as the alarm sounds. As this handle rotates the projection $31^a$ strikes the lower end of the lever $29^a$ and swings upon its pivotal support, thus moving the upper end of the lever in a counter clock-wise direction and forcing the lock 32 out of engagement with the right hand side of the guide. The remaining part of the apparatus operates in a manner previously described.

Having thus described my invention, what I desire to claim and secure by Letters Patent of the United States is:

1. A window closing device comprising a spring pulling the window downward, said spring having trigger receiving means, a trigger for locking the spring against its downward tension, means to move said trigger into locked position in respect to the spring, and means for releasing the trigger, whereby the spring pulls the window downward.

2. A spring actuated window closing device, comprising a spring having connection with the window, said spring having openings therein, a trigger having a tapered end engaging said spring openings, means to move the trigger into engagement with the spring, means to lock the trigger in said position and means for releasing the trigger engaging means, whereby the trigger is pushed out of engagement with the spring and the spring pulls the window downward.

3. A device for closing a window, comprising a spring having attachment with the window and exerting a normal downward pull, a movable lock engaging said spring and locking it against its downward tension, means for holding said lock in locked relation with the spring, and means for disengaging said lock actuating means from the lock, whereby the spring is released and the window pulled downward.

4. A device for closing a window, comprising a housing carrying a spring, operative connection between the spring and the window, a housing carrying a guide for said spring, a trigger movable into and out of said guide, openings in said spring engaged by said trigger, means to move said trigger into engagement with the spring and means to lock said trigger actuating means, and means for releasing said trigger actuating means from its locked position, whereby the spring exerts its normal downward pull upon the window and operates the same.

5. A device for closing a window, comprising a spring having operative connection with the window and exerting a normal downward pull thereupon, a housing carrying a trigger adapted to engage said spring and lock it against its downward tension, an eccentric lever carrying an eccentric engaging the end of said trigger for moving the trigger into engagement with the spring, means to lock said lever and eccentric in engagement with the trigger, and means to release said lever locking means, for the purpose described.

6. A device for closing a window, comprising a spring having connection with the window and normally exerting a downward pull thereupon, a series of openings in said spring, a trigger having a tapered end for engaging said opening, means for moving the trigger into engagement with the spring and locking it in said position, means to release said trigger engaging means, and means to move the trigger engaging means out of engagement with the trigger, whereby the downward tension of the spring forces the trigger away from and out of engagement with the spring and permits the spring to pull the window downward.

7. A device for closing a window, comprising a spring having engagement with the window and normally exerting a downward pull thereupon, said spring being provided with a series of openings, a trigger slidable in respect to said spring and provided with a tapered end for engagement with said spring openings, an eccentric for actuating said trigger towards the spring, an eccentric lever, a lock bar for said lever, a guide for said lock bar, a shoulder on said lock bar for engagement with said guide, a spring in said guide for normally causing the shoulder to engage the guide, means for releasing the shoulder of the lock bar from engagement with the guide and means to automatically move the eccentric out of engagement with the trigger, whereby the downward tension of the spring forces the trigger out of engagement with the spring openings and permits the spring to pull the window downward.

8. A window closing device comprising a coil spring of tape form, one end of said spring tape being attached to the window and exerting a downward pull thereupon when the window is in a raised position, a movable lock, said spring tape being provided with openings, means to move and hold said lock into engagement with said spring openings to hold the spring against its tension, and means for releasing said

lock holding means, for the purpose described.

9. A spring actuated window closing device, comprising a coil spring in the form of a tape mounted within a housing, the housing above said spring housing having therein a trigger and means to reciprocate the same, said spring tape extending from its housing upwardly past the housing having the trigger and attached to the window and exerting a downward pull thereupon when the window is in raised position, said spring tape being provided with a plurality of openings, said trigger housing provided with an opening in which said trigger reciprocates for engagement with the spring openings, means to reciprocate the trigger and hold it in locked relation with the spring tape, and means to release the locking and actuating means of the trigger, for the purpose described.

10. A window closing device comprising a coil spring of tape form, one end of said spring tape being attached to the window and exerting a downward pull thereupon when the window is in a raised position, a sliding lock, said spring tape being provided with openings, means to move and hold said lock in engagement with said spring openings to hold the spring aganist its tension, and means for releasing said lock holding means, for the purpose described.

11. A spring actuated window closing device, comprising a coil spring in the form of a tape mounted within a housing, the housing extending above said spring and having therein a trigger and means to reciprocate the same, said spring tape extending from its housing upwardly past that portion of the housing carrying the trigger and attached to the window and exerting a downward pull thereupon when the window is in a raised position, said spring tape being provided with a plurality of openings, said housing provided with an opening in which said trigger reciprocates for engagement with the spring openings, means to reciprocate the trigger and hold it in locked position with the spring tape, and means to release the locking and actuating means of the trigger, for the purpose described.

12. A spring actuated window closing device, comprising a spring having connection with the window, said spring having openings therein, a trigger having a tapered end engaging said spring openings, means to move the trigger into engagement with the spring, means to lock the trigger in said position, and means for releasing the trigger actuating means, whereby the trigger is pushed out of engagement with the spring and the spring pulls the window downward.

13. A device for closing a window, comprising a housing carrying a spring, operative connection between the spring and the window, a housing carrying a guide for said spring, a trigger movable into and out of said guide, openings in said spring engaged by said trigger, means to move said trigger into engagement with the spring, and means to lock said trigger actuating means, and means for releasing said trigger actuating means from its locked position, whereby the spring exerts its normal downward pull upon the window and closes the same.

14. A device for closing a window, comprising a spring having engagement with the window and normally exerting a downward pull thereupon, said spring being provided with a series of openings, a trigger slidable in respect to said spring and provided with a tapered end for engagement with said spring openings, an eccentric for actuating said trigger towards the spring, an eccentric lever, a lock bar for said lever, a guide for said lock bar, a shoulder on said lock bar adapted for engagement with said guide, a spring in said guide for normally causing said lock bar shoulder to engage the guide, means for releasing the shoulder of the lock bar from engagement with the guide, means to move the eccentric lever and cause the eccentric to move out of engagement with the trigger, whereby the downward tension of the spring forces the trigger out of engagement with the spring openings and permits the spring to pull the window downward.

15. A window closing device comprising a spring, one end of said spring being attached to the window and exerting a downward pull thereupon when the window is in a raised position, a movable lock, said spring being provided with means adapted to be engaged by said lock, means to move and hold said lock in engagement with said spring to hold the spring against its tension, and means for releasing said lock holding means, for the purpose described.

16. A device for closing a window, comprising a spring having engagement with the window and normally exerting a downward pull thereupon, said spring being provided with an opening, a trigger movable into and out of engagement with said spring opening, a member for actuating said trigger, a lock for said member when it is in engagement with said trigger, means to move said member from its locked position, means normally holding said member out of engagement with the trigger, and said spring acting to close the window when the trigger operating member is in an unlocked position.

In testimony whereof I hereunto affix my signature.

LOUIS VANCE BLUE.