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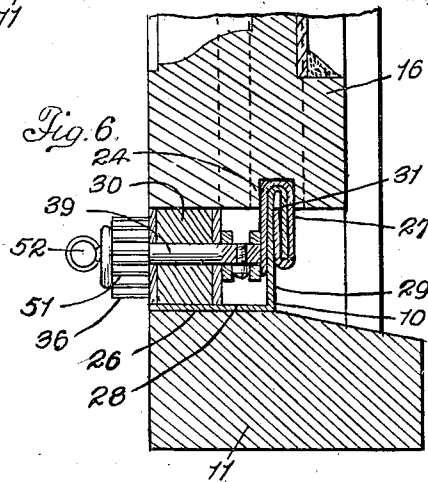
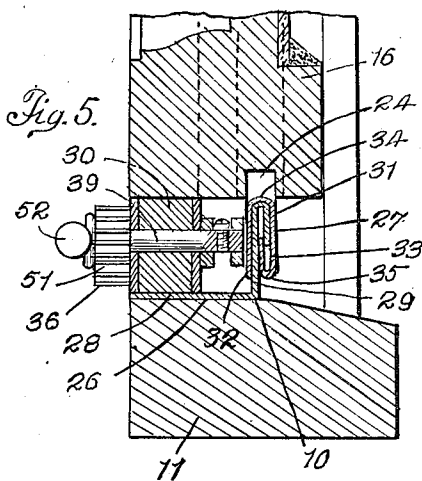
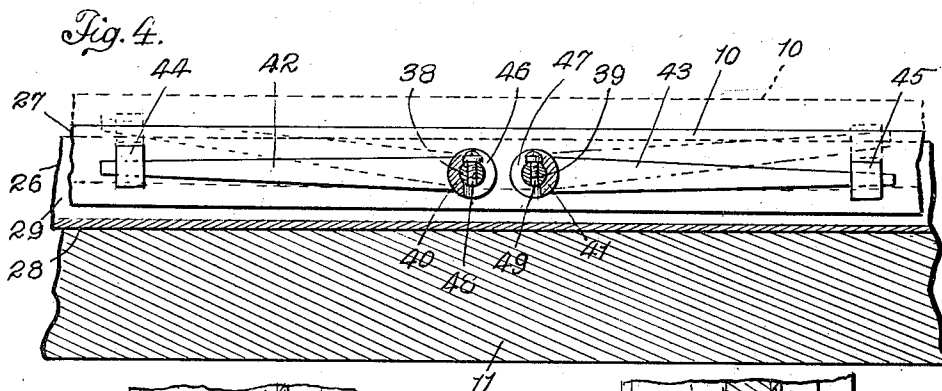
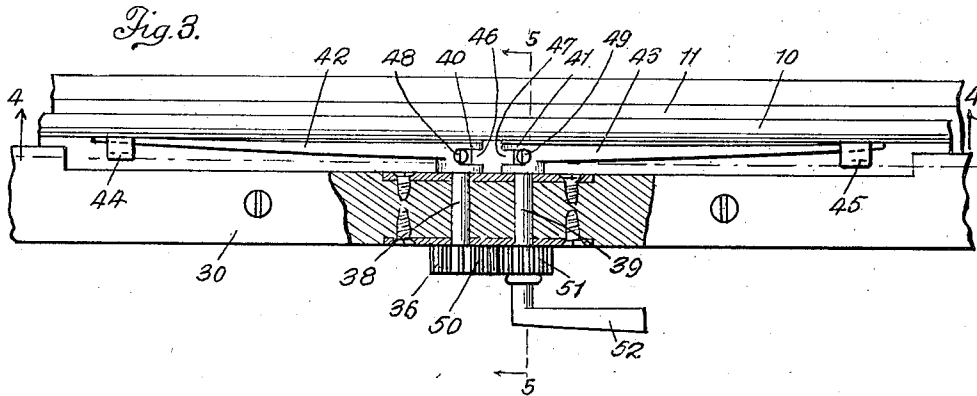
1,471,525

A. PAVOLA

WINDOW LOCK AND GUARD

Filed Sept. 20, 1921

3 Sheets-Sheet 2



INVENTOR  
Alfred Pavola  
BY  
W. J. Criswell  
ATTORNEY

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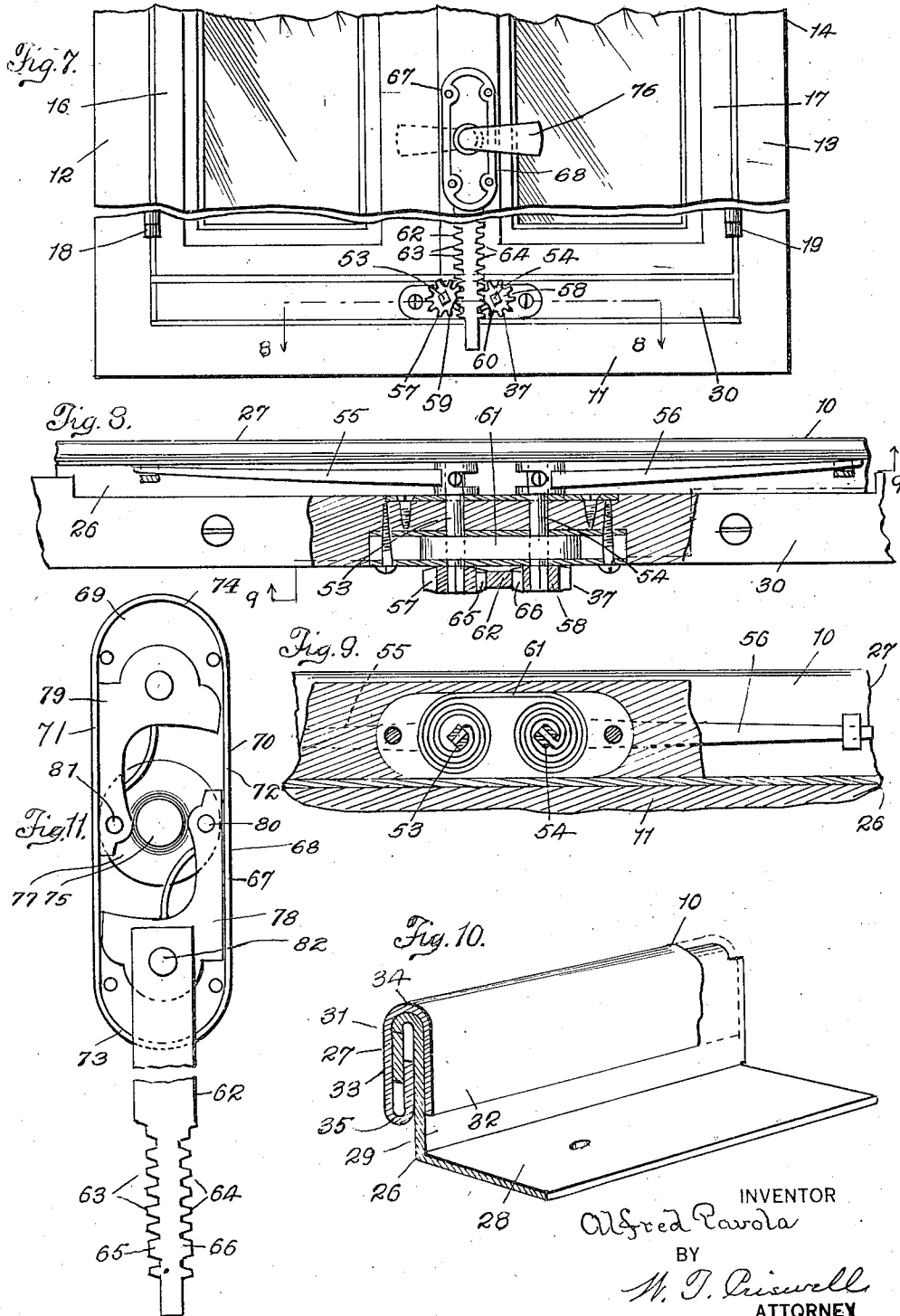
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ATTORNEY

# UNITED STATES PATENT OFFICE.

ALFRED PAVOLA, OF NEW YORK, N. Y.

WINDOW LOCK AND GUARD.

Application filed September 20, 1921. Serial No. 502,006.

*To all whom it may concern:*

Be it known that I, ALFRED PAVOLA, a citizen of Finland, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in a Window Lock and Guard, of which the following is a full, clear, and exact specification.

This invention relates to a class of devices adapted to be used especially in conjunction with casement windows.

My invention has for its object primarily to provide a lock and guard designed to be employed for releasably locking the sashes particularly of casement windows when swung to closed positions in the frames, and which is of a form serving to prevent rain from flowing through the space under the closed windows during inclement weather. This is accomplished mainly by providing on the base member of the window frame a locking element and guard for being moved upwardly and downwardly into and out of the grooves of the sashes when closed in the frame to releasably lock the sashes and close the space between the lower edges of the sashes and base member so that rain and the like will be obstructed from flowing therethrough.

Another object of the invention is to provide mechanism which is manually operable for operating the locking element and guard; and a further object of the invention is to provide a window lock and guard of a simple, efficient and durable construction which may be made of any suitable material in appropriate sizes.

With these and other objects in view, the invention will be hereinafter more fully described with reference to the accompanying drawings forming a part of this specification in which similar characters of reference indicate corresponding parts in all the views, and will then be pointed out in the claims at the end of the description.

In the drawings Figure 1 is a fragmentary detail sectional view showing a top plan of one form of my improved lock and guard applied to a casement window, the view being taken on the line 1—1 of Fig. 2.

Fig. 2 is an enlarged elevation, partly sectional, of the window with the device applied thereto, the view being taken on the line 2—2 of Fig. 1.

Fig. 3 is an enlarged fragmentary view

showing a detail sectional plan of the base member of the frame of the window with the device applied thereto.

Fig. 4 is an enlarged fragmentary view, showing a sectional elevation taken on the line 4—4 of Fig. 3.

Fig. 5 is an enlarged fragmentary view taken on the line 5—5 of Fig. 3, and shows the locking element and guard in an unlocked position.

Fig. 6 is a similar view taken on the same line, showing the locking element and guard in a locked position.

Fig. 7 is a fragmentary view, partly broken away, showing a slightly modified form of the device applied to a window.

Fig. 8 is an enlarged detail sectional view taken on the line 8—8 of Fig. 7.

Fig. 9 is an enlarged fragmentary detail sectional view taken on the line 9—9 of Fig. 8.

Fig. 10 is an enlarged fragmentary view showing a perspective of the locking element used in the device, and

Fig. 11 is an enlarged rear elevation of the operative mechanism used in the modified form of the device.

The device has a locking element and guard 10 which is arranged on the base member 11 between the stiles 12 and 13 of the frame 14 of a window 15 of a class commonly known as a casement window constructed usually with two sashes, as 16 and 17, which are hinged, at 18, 18<sup>a</sup>, and 19, 19<sup>a</sup>, to the stiles 12 and 13 for adapting them to be swung inwardly and outwardly of the frame to open and closed positions. In such casement windows it is customary to provide in the hinged edges of the sashes vertical grooves, as 20 and 21, and on the opposed faces of the stiles 12 and 13 of the frame 14 may be fixed protruding weather strips, as 22 and 23, for being received in the grooves 20 and 21 when the sashes are closed in the frame. In practicing my invention I provide in the lower edges of the sashes normally aligned grooves 24 and 25 which are in opposed relation to the base member 11 of the frame 14 of the window for reception of the locking element and guard 10.

This locking element and guard may be of any suitable form, though the element shown is composed of cooperating strips, as 26 and 27, which are operably arranged on

the base member 11 of the frame 14, and these strips are of such lengths as to embrace the space between the stiles 12 and 13 of the window frame. The strip 26 is substantially L-shaped in cross section to provide two angular flanges 28, 29, and this strip is applied to the window frame by arranging the flange 28 on the upper face of the base member 11 so that it will be under the lower edges of the sashes 16 and 17. On top of the flange 28 of the strip 26 is a bar 30 extending between the stiles of the frame 14, and this bar is bolted or otherwise secured to the flange and to the base member 11 so that the strip 26 will be held stationary to the frame in a manner whereby the flange 29 of the L-shaped strip 26 will protrude upwardly in spaced proximity to the edge of the bar 30 at the outside of the window. The sashes 16 and 17 of the window are hinged to the frame 14 for being swung inwardly and outwardly of the frame to and from above the bar 30 so that the grooves 24 and 25 of the sashes will be approximately above the flange 29 of the stationary strip 26, and the upper free edge of the flange 29 of the stationary strip is bent over in the fashion of an inverted U, as at 31. The strip 27 of the locking element and guard 10 is bent lengthwise in the shape of an inverted U to provide two spaced flanges, as 32, 33, and a spanning member 34. The lower free edge of the flange 33 of the strip 27 is also bent inwardly between the flanges 32 and 33 in substantially a U-shape, as at 35. The strip 27 as thus formed is disposed in straddle arrangement over the inverted U-shaped part 31 of the strip 26 so that the inner leg of the U-shaped part 35 interfits, as shown, in the U-shaped part 31 of the strip 26, and the strip 27 is of such a size that it is adapted to be freely moved transversely upwardly and downwardly on the stationary strip 26. The strip 27 is also of such thickness that its spanning member 34 and adjacent parts of its flanges 32 and 33 may be moved into and out of the grooves 24 and 25 of the sashes 16 and 17 of the window when the sashes are closed in the frame 14, in order to releasably lock the sashes and to serve as a guard by closing the space between the sashes and the sill 11 for obstructing the passage of wind, rain and snow during inclement weather. The locking element and guard 10 may be moved to locked and unlocked positions by manually operative mechanism, as 36 Figs. 1, 2, 3, 5, 6, or by manually operative mechanism, as 37 Figs. 7, 8, 9, 11.

The mechanism 36 has two spaced studs or short shafts 38 and 39 which are journaled in spaced parallel relation in the central part crosswise of the bar 30 of the window frame 14 so that one of the ends of each stud is in close proximity to the adjustable strip 27 of the locking element 10, and these studs are of such lengths that both of their ends protrude beyond the opposite side edges of the bar 30 of the frame 14. On the ends of the studs 38 and 39 in opposition to the adjustable strip 27 of the locking element 10 are rotatably arranged apertured heads, as 40 and 41, each provided on one of the ends of each of the two bars 42 and 43 which extend in opposite directions lengthwise of the strip 27 of the locking element 10, and the other ends of these bars are movably disposed in spaced eyes, as 44 and 45, which are provided on this strip. The apertured heads 40 and 41 of the bars 42 and 43 may be somewhat circular in shape, and in the parts of the outer peripheries of these heads opposite to the bars are substantially semi-circular slots 46 and 47, respectively. Projecting into these slots from the studs 38 and 39 are pins, as 48 and 49, which are movable in the slots when the studs are rotated for being swung into contact with the ends of the slots to cause the heads 40 and 41 of the bars 42 and 43 to be partly revolved to swing the free end portions of the bars upwardly and downwardly which in turn will move the strip 27 of the locking element 10 likewise in upward and downward directions into and out of the grooves 24 and 25 of the sashes 16 and 17 when closed in the window frame 14. On the second or outer ends of the studs 38 and 39 are held meshing gears or pinions, as 50 and 51, and protruding from one of the gears is a crank handle, as 52, which when manually swung rotatably will cause the gears 50, 51 and the studs 38 and 39 to revolve in opposite directions. The pins 48 and 49 of the studs will then be likewise rotatably swung to accordingly engage the ends of the slots 46 and 47 of the heads 40 and 41 of the bars 42 and 43 for moving the strip 27 of the locking element 10 to lock or unlock the window sashes, as above explained.

The mechanism 37 includes studs 53, 54 and bars 55, 56 which are preferably similar in form as well as being correspondingly employed to operate the strip 27 of the locking element 10 as the studs 38, 39 and the bars 42, 43 of the mechanism 36. On the ends of the studs 53 and 54 opposite to the bars 55 and 56 are two spaced gears or pinions 57 and 58. Some of the teeth of these gears are cutaway or removed to provide recesses 59 and 60 which are in register when the gears and studs 53 and 54 are normally at rest. To the central parts of the studs 53 and 54 may be held the ends of a spring, as 61, having its ends convoluted in encircling fashion upon the studs, while the central part of the spring spans the studs. This spring is tensioned for normally serving to

5 revolvably hold the studs 53, 54 and the bars  
 55, 56 in directions whereby the strip 27 of  
 the locking element 10 will be yieldingly  
 held normally in a lowered or unlocked po-  
 10 sition on the base member 11 of the window  
 frame 14 and so that the recesses 59 and 60  
 of the gears 57 and 58 are in register. On  
 one of the sashes of the window is mounted  
 a bar or rod as 62, which is movable in up-  
 15 ward and downward directions so that its  
 lower end will pass into and out of the space  
 between the gears 57, and 58. Projecting in  
 opposite lateral directions from the lower  
 end part of this bar are two rows of teeth, as  
 20 63 and 64, and between the teeth at the  
 lower ends of these rows are two lugs, as 65  
 and 66, of sizes and shapes to adapt them to  
 be movably inserted in the recesses 59 and  
 60 of the gears 57 and 58. When the win-  
 25 dow sashes are unlocked and swung open the  
 bar 62 is normally positioned to extend be-  
 low its sash so that its lower toothed end  
 will pass into the space between the gears  
 57 and 58 with the lugs 65 and 66 being mov-  
 30 ably seated in the recesses 59 and 60. On  
 the central part of the window sash carry-  
 ing the toothed bar 62 may be a device, as  
 67, of a commonly used type having a casing  
 68 formed of a plate 69 on one face of which  
 35 is a protruding flange 70 with vertically dis-  
 posed spaced parallel side walls 71, 72 and  
 having curved end walls 73, 74. In the cen-  
 tral part of the plate 69 is a rotatable stud  
 shaft 75 of a length so that it protrudes into  
 40 and exteriorly of the casing 68. On the  
 outer end of the stud shaft is a handle 76,  
 and on the end of the shaft interiorly of the  
 casing is held a circular disk 77. Within  
 the upper and lower parts of the casing are  
 45 spaced slides 78, 79 which are movable to-  
 ward and from each other to and from the  
 ends of the casings. The opposed ends of  
 these slides are pivoted, respectively at 80,  
 81, to opposite parts of the disk 77 diametri-  
 50 cally to its center, and to the second end of  
 the lower slide is pivoted, at 82, the upper  
 end of the toothed bar 62. When the sashes  
 are closed in the frame the toothed bar will  
 be moved into engagement with the gears 57,  
 58, as shown in Figs. 7 and 8, and when the  
 handle 76 is swung accordingly the rotation  
 of the shaft 75 will partly rotate the disk 77  
 to move the slides 78, 79 for causing the  
 55 toothed bar 62 to move downwardly. The  
 gears 57, 58 and the studs 53, 54 will then  
 be revolved sufficiently to swing the bars 55,  
 56 upwardly which in turn will move the  
 strip 27 of the locking element 10 into the  
 60 grooves 24, 25 of the sashes 16, 17. The  
 sashes will then be releasably locked in the  
 frame, and the space under the sashes will  
 be closed against the passage of wind, rain  
 and snow during inclement weather.

65 In the foregoing description, I have em-  
 bodied the preferred form of my invention,

but I do not wish to be understood as limit-  
 ing myself thereto, as I am aware that modi-  
 fications may be made therein without de-  
 parting from the principle, or sacrificing  
 any of the advantages of this invention, 70  
 therefore, I reserve to myself the right to  
 make such changes as fairly fall within the  
 scope thereof.

Having thus described my invention, I  
 claim as new and desire to secure by Letters  
 Patent:—

1. In a window structure, comprising a  
 frame and swinging sashes having grooves  
 in their lower faces which aline when said  
 sashes are closed, a window lock and guard  
 75 comprising a member having an upper and a  
 lower portion movable relatively to each  
 other, and means for moving the upper  
 portion to enter the grooves in said sashes,  
 said lower portion having sill engaging  
 80 means, and said moving means comprising  
 a pair of parallel stud shafts extending  
 perpendicular to said member, a pair of arms  
 mounted on said stud shafts and moved by  
 rotation thereof, one end of each of said  
 85 arms being slidably secured to said movable  
 portion, and means to rotate said stud  
 shafts whereby the arms may be swung to  
 cause vertical movement of said movable  
 portion.

2. In a window structure, comprising a  
 frame and swinging sashes having grooves  
 in their lower faces which aline when said  
 sashes are closed, a window lock and guard  
 90 comprising a member having an upper and  
 a lower portion movable relatively to each  
 other, and means for moving the upper  
 portion to enter the grooves in said sashes,  
 said lower portion having sill engaging  
 95 means, and said moving means comprising  
 a pair of parallel stud shafts extending per-  
 pendicular to said member, a pair of arms  
 mounted on said stud shafts and moved by  
 rotation thereof, one end of each of said  
 100 arms being slidably secured to said movable  
 portion, two gears on the stud shafts, and  
 means to rotate said gears and stud shafts  
 whereby the arms may be swung to cause  
 vertical movement of said movable portion. 105

3. In a window structure, comprising a  
 frame and swinging sashes having grooves  
 in their lower faces which aline when said  
 sashes are closed, a window lock and guard  
 110 comprising a member having upper and  
 lower overlapping strips movable relatively  
 to each other, and means for moving the  
 upper strip to enter the grooves in said  
 sashes, said lower strip having sill engaging  
 115 means, and said means comprising a pair  
 of parallel stud shafts extending perpen-  
 dicular to said member, a pair of arms  
 mounted on said stud shafts and moved by  
 rotation thereof, one end of each of said  
 120 arms being slidably secured to said movable  
 portion. 125

strip, and means to rotate said stud shafts whereby the arms may be swung to cause vertical movement of said movable strip.

5 4. In a window structure, comprising a frame and swinging sashes having grooves in their lower faces which aline when said sashes are closed, a window lock and guard comprising a member having a lower strip and an overlapping upper strip movable relatively to the lower strip, and means for moving the upper strip to enter the grooves in said sashes, said lower strip having sill engaging means, and said moving means comprising a pair of parallel stud shafts extending perpendicular to said member, a pair of arms mounted on said stud shafts and moved by rotation thereof, one end of each of said arms being slidably secured to said movable upper strip, two gears on the stud shafts, and means to rotate said gears and stud shafts whereby the arms may be swung to cause vertical movement of said upper strip.

25 5. In a window structure, comprising a frame and swinging sashes having grooves in their lower faces which aline when said sashes are closed, a window lock and guard comprising a member having interfitting upper and lower strips movable relatively to each other, and means for moving the upper strip to enter the grooves in said sashes, said lower strip having sill engaging means, and said moving means comprising a pair of parallel stud shafts extending

perpendicular to said member, a pair of arms mounted on said stud shafts and moved by rotation thereof, one end of each of said arms being slidably secured to said movable upper strip, and means to rotate said stud shafts whereby the arms may be swung to cause vertical movement of said upper strip.

6. In a window structure, comprising a frame and swinging sashes having grooves in their lower faces which aline when said sashes are closed, a window lock and guard comprising a member having interfitting upper and lower strips movable relatively to each other, and means for moving the upper strip to enter the grooves in said sashes, said lower strip having sill engaging means, and said moving means comprising a pair of parallel stud shafts extending perpendicular to said member, a pair of arms mounted on said stud shafts and moved by rotation thereof, one end of each of said arms being slidably secured to said movable upper strip, two gears on said stud shafts, and means to rotate said gears and stud shafts whereby the arms may be swung to cause vertical movement of said upper strip.

This specification signed and witnessed this 19' day of September A. D. 1921.

ALFRED PAVOLA.

Witnesses:

H. E. LUNDIN,  
FREDERICK CRYER.