Oct. 14, 1924. 1,511,704

A. BUCK

WINDOW CLEANER'S SAFETY DEVICE

Filed June 11, 1921

Fig 1

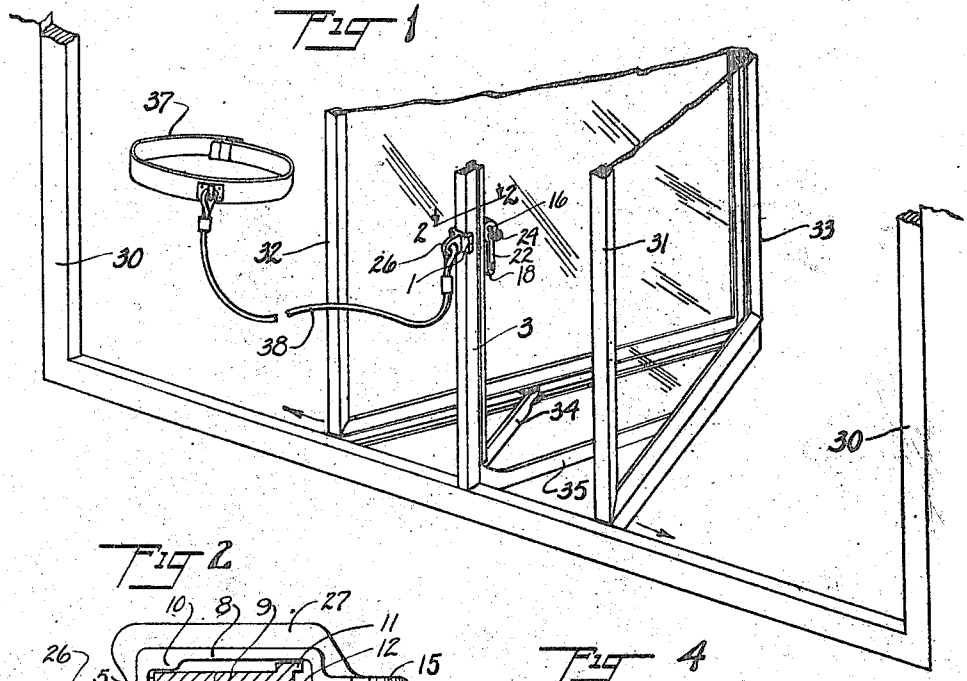


Fig 2

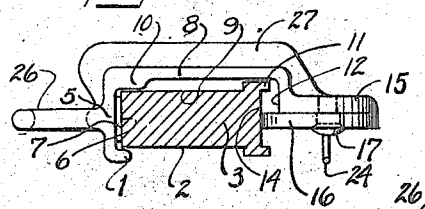


Fig 4

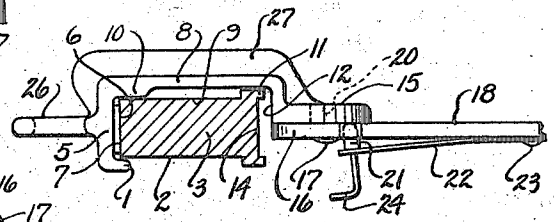


Fig 3

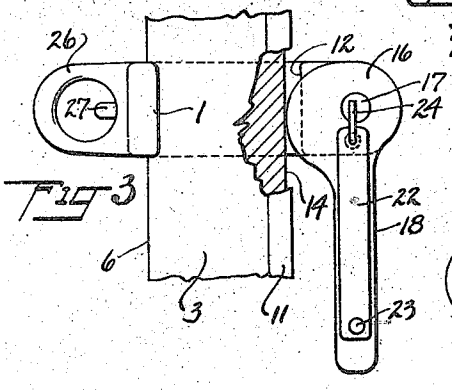
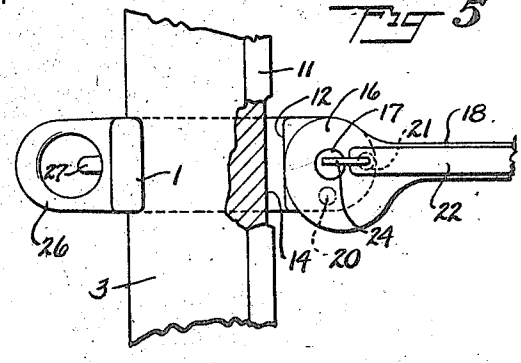


Fig 5



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UNITED STATES PATENT OFFICE.

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WINDOW-CLEANER'S SAFETY DEVICE.

Application filed June 11, 1921. Serial No. 476,829.

To all whom it may concern:

Be it known that I, AINSWORTH BUCK, a citizen of the United States, residing in Summit, in the county of Union and State of New Jersey, have made certain new and useful Improvements in Window-Cleaners' Safety Devices, of which the following is a specification.

The invention relates to window cleaners' safety devices and especially to the clamp or means for attaching said devices directly to some structural member of the window or building.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:—

Fig. 1 is a perspective view of a window showing the clamp of the safety device attached to the window mullion;

Fig. 2 is an enlarged horizontal section, taken on the line 2—2 of Fig. 1, and showing the clamp locked on the mullion;

Fig. 3 is fragmentary, side elevation, greatly enlarged, looking at the clamp and mullion of Fig. 1 from the right and at Fig. 2 from the bottom of the figure;

Fig. 4 is a view corresponding to Fig. 2, but showing the clamp unlocked from the mullion; and

Fig. 5 is a view corresponding to Fig. 3, but, like Fig. 4, showing the clamp unlocked from the mullion.

The invention provides a clamp or like attaching means for a window cleaner's safety device which is practically instantly attachable directly to a mullion, or other part of the window or building structure, which firmly and automatically locks in such clamped position and which remains so locked until manually released. Other features and advantages of the invention will be set forth in connection with the following detail description of the present preferred embodiment.

Referring now to the accompanying drawings, illustrating by way of example one embodiment of the invention, the safety clamp or attaching device is especially designed to engage and hold itself firmly or fixedly in place against vertical displacement, as well as against horizontal displacement. The clamp is shown in Fig. 1 fixed in position on the vertically disposed mullion of a vertically hinged window, the clamp or safety device being attachable to the mullion at any desired height, the clamping means automatically locking during the clamping action and firmly and fixedly holding the device in position until the locking means is manually released. It will be understood that the application of the clamp to the mullion and to the particular form of window shown is illustrative and explanatory and is not restrictive of the invention.

In the embodied form and according to one feature of the invention, the clamp engages four sides of the mullion or other or corresponding structural part of the window or building. As embodied, the clamp is provided with a lip or flange 1, adapted to take around or about the face 2 of the mullion 3, and to prevent sidewise or horizontal displacement of the clamp. What may conveniently be termed the back 5 of the clamp fits about the next adjacent face 6 of the mullion. If desired, a layer of leather or other suitable material 7 may be fitted within the end 5 to form a bearing surface for the mullion which will avoid scratching or marring it; and which will constitute a resilient pressure surface to increase the clamping pressure of the clamp on the mullion.

The third side 8 of the clamp encloses or embraces the corresponding side 9 of the mullion, and is provided with a shoulder 10, which provides for cases where the mullion, or other supporting part or member, has a bead 11 projecting laterally or sidewise from its front face, as shown in Figs. 2 and 4. The fourth side 12 of the clamp preferably extends only partially across the fourth side 14 of the mullion or other supporting member. In the embodied form the clamping mechanism or holding device and the locking means are mounted or located upon this fourth side.

As embodied, to provide a suitable mount-

ing or support for said clamping device and said locking device, the clamp frame or body is provided with a member or part 15, projecting outwardly longitudinally from the side 12 of the clamp body, and preferably substantially perpendicularly thereto. The embodied form of clamping device comprises a movable clamping cam, mounted upon the member or part 15, and as so embodied, said clamping means comprises a rotatable, eccentric cam 16, pivoted on the member 15 by suitable means, such as a rivet 17, which holds the eccentric firmly to the clamp body, while permitting it to have the requisite rotative movement. The eccentric cam 16 is provided with a lever or handle 18, fixed thereto and extending outwardly therefrom.

In Figs. 4 and 5, the eccentric cam 16 is shown rotated or swung to the open or unclamping position, and the clamp can be placed about the mullion or other supporting member 3, the member passing in between the end of the edge or lip 1 and the inner face of the side 12 of the clamp, as shown in Figs. 4 and 5. When the mullion or other part 3 is within the clamp, and the clamp is at the right elevation, the handle 18 is rotated or swung, the edge of the eccentric cam 16 engages the face 14 of the mullion or other part 3, and the mullion or other member 3 is seated or nested between and within the lip or side 1 and the shoulder 10 of the clamp, thus insuring the clamp against sidewise or lateral displacement. The member 7 is pressed firmly against the face 6 of the mullion, due to the opposite and increasing pressure of the eccentric 16 against the face 14 of the mullion as the lever 18 is moved from the position of Fig. 5 to the position of Fig. 3. This insures the clamp against displacement in this direction and also firmly clamps it in position along the mullion or like part 3.

The automatic locking means, as embodied, comprises a hole or aperture 20, formed in the projecting part 15 of the clamp. A pin 21, which is adapted to pass into and fit within the aperture 20, is mounted upon a leaf spring 22, which is fastened to the handle 18 by suitable means, such as a rivet 23. The aperture 20 is so positioned that as the eccentric 16 comes to final clamping position, the pin 21 (which has been in the position of Fig. 4, with its inner end sliding along the face of the part 15 of the clamp) comes into register with the hole 20 and snaps thereinto under the impulsion of the spring 22. This positively locks the clamp in the clamping position with the member 16 exerting powerful pressure against the mullion or corresponding part 3, between the clamp member 5 and the clamp member 12, to hold the clamp firmly in position against displacement in any direction.

Manually operated means are provided for unlocking the clamp, and for this purpose, as embodied, a hook or handle 24 is fixed to the pin 21, and extends outwardly therefrom, whereby the pin 21 may be drawn out of hole 20 by hand against the pressure of spring 22, and the handle 18 may then be swung around to move eccentric cam 16 from the position of Fig. 3 to that of Fig. 5, to permit the clamp to be removed from the mullion or other structural member 3. The clamp is thus capacitated for practically instantaneous placement in position, and for instantaneous clamping fixedly in such position, the device automatically locking itself to such fixed position, and requiring manual operation by the window cleaner to unlock it.

For the purpose of attaching to the clamp the window cleaner's chain or rope, which at its other end is fastened to the cleaner's belt, the clamp is provided with an eye ring or anchor 26 preferably cast or formed integral with the clamp. A reinforcing rib 27 is also preferably provided extending along the sides 5, 8 and 12 of the clamp, and cast or formed integral with the clamp.

In Fig. 1, the clamp is shown illustratively and exemplarily applied to one well-known type or structure of window, the window being provided with a frame or casing 30, and with a centrally located vertically disposed mullion 3. The window has two sash 31 and 32, hinged together vertically and centrally at 33. The sash in both their lower and upper reaches are pivotally supported, respectively, on the ends of a pair of arms 34 and 35, the arms of each pair, being pivotally supported or hinged at their other ends just within the mullion 3.

The inside of the window is accessible for cleaning when it is closed, but the outside is accessible for cleaning when the window is opened to substantially the position of Fig. 1. The approximate location and the manner of using the clamp in connection with this type of window structure and in cooperation with the window or building structure and with the window cleaner's safety belt will be clear from Fig. 1 without further description. The window cleaner's belt 37 is connected to the clamp by the chain or rope or like member 38. The safety device of the invention can be used with other kinds of windows and window structures.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:—

1. A window cleaner's safety device comprising a clamp for attachment to and en-

gagement with a four sided structural member on the four sides thereof, a securing device pivoted to the clamp for frictionally engaging one side of the said structural member and movable to operative or inoperative position with a single movement, means for automatically locking the said device in securing position when it arrives at such position, and means affixed to the clamp for attachment thereto of a window cleaner's belt.

2. A window cleaner's safety device comprising a clamp for attachment to and engagement with a structural member, a securing cam pivoted to one side of the clamp for frictionally engaging one side of the structural member and movable to operative or inoperative position with a single movement, and a ring carried on the side of the clamp opposite the cam for attachment thereto of a window cleaner's belt.

3. A window cleaner's safety device comprising an integral frame engageable with three sides of a window mullion or the like, a clamping device carried by said frame adapted to exert a clamping pressure against the fourth side of the mullion, and substantially perpendicular thereto, and an anchoring device formed integral with said frame for attachment thereto of a strap from the window cleaner's belt.

4. A window cleaner's safety device comprising an integral frame engageable with three sides of a window mullion or the like, a cam pivotally carried by said frame for exerting a clamping force against the fourth side of the mullion, and substantially perpendicular thereto, and an anchoring device formed integral with said frame for attachment thereto of a strap from the window cleaner's belt.

5. A window cleaner's safety device comprising an integral frame engageable with three sides of a window mullion or the like, a downwardly swinging cam pivotally carried by the frame for exerting a clamping force against the fourth side of the mullion, and an anchoring ring formed integral with said frame and located on that side of the frame opposite the cam for attachment thereto of a strap from a window cleaner's belt.

6. A window cleaner's safety device, comprising in combination a frame adapted to engage three successive sides of a four-sided structural element, a clamping device carried by the frame for exerting a pressure against and substantially perpendicular to the fourth side, and means carried by the frame for attachment thereto of a strap from a window cleaner's belt.

7. A window cleaner's safety device, comprising in combination a frame adapted to engage three successive sides of a four-sided structural element, a cam pivoted to the frame and adapted to exert a clamping pressure against and substantially perpendicular to the fourth side, and means carried by the frame for attachment thereto of a strap from a window cleaner's belt.

8. A window cleaner's safety device, comprising in combination a single member extending around four sides of a window mullion, a single element for locking said member to the mullion, and means on the frame for securing an end of a safety belt thereto.

9. A window cleaner's safety device, comprising in combination a single member extending around four sides of a window mullion, a single cam-operated element for locking said member to the mullion, and means on the frame for securing an end of a safety belt thereto.

10. A window cleaner's safety device, comprising in combination a single member extending around four sides of a window mullion, and a single element for locking said member to the mullion adapted to exert a force substantially perpendicular to the fourth side of the window mullion.

11. A window cleaner's safety device, comprising in combination a single frame extending around four sides of a window mullion, a cam lever pivoted to said frame to move in a plane perpendicular to the plane of the frame, for locking the frame to the window mullion, and means on the frame for attachment thereto of a safety belt.

12. A window cleaner's safety device, comprising in combination an integral frame extending around four sides of a window mullion, a cam lever pivoted to the frame to move in a plane perpendicular thereto, for exerting a force perpendicular to a side of the mullion for locking the frame thereto, and means on the frame for attachment thereto of a window cleaner's belt.

In testimony whereof, I have signed my name to this specification.

AINSWORTH BUCK.