

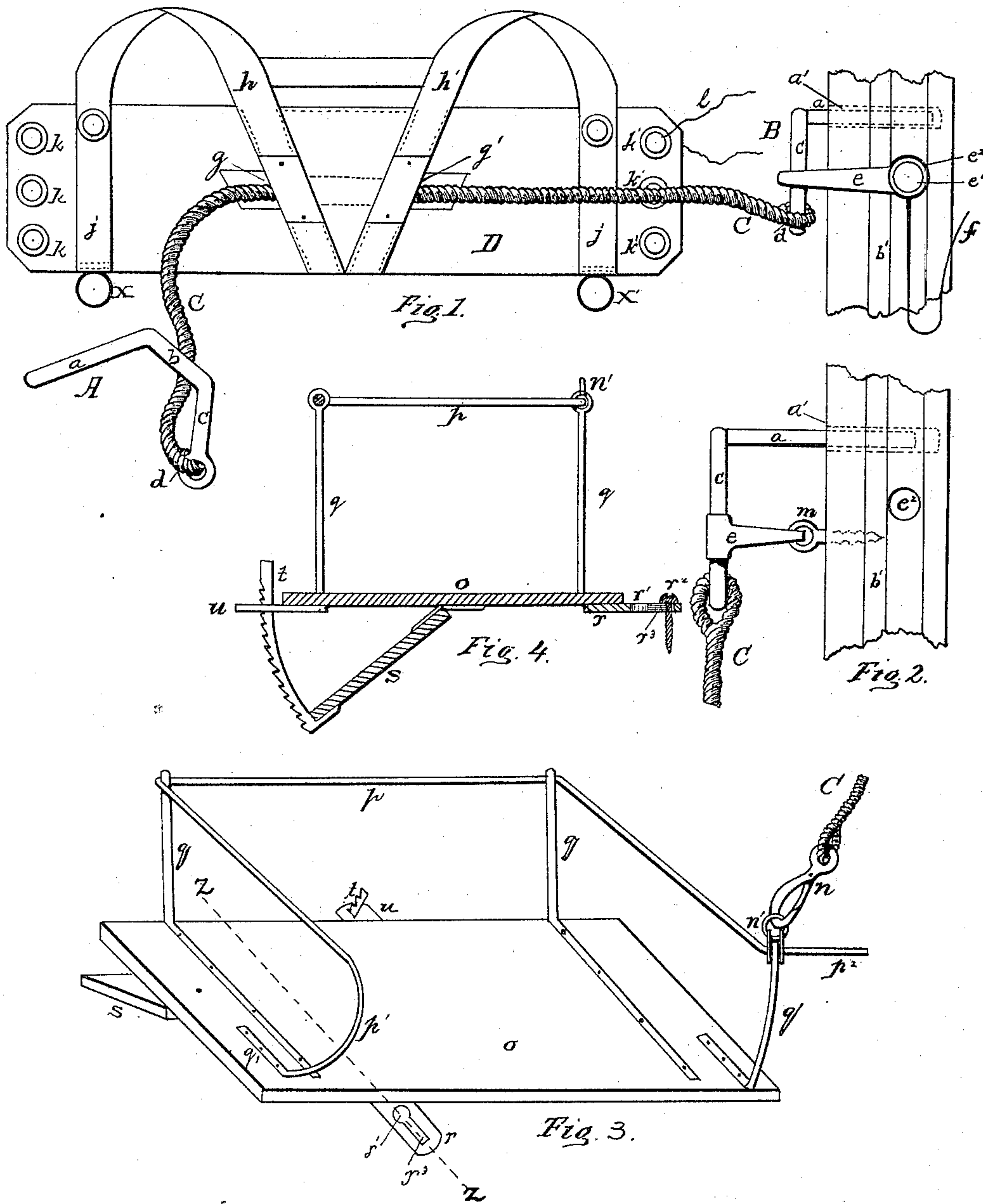
(No Model.)

2 Sheets—Sheet 1.

H. K. WHITNER.  
SAFETY APPARATUS FOR WINDOW CLEANERS.

No. 474,586.

Patented May 10, 1892.



Witnesses

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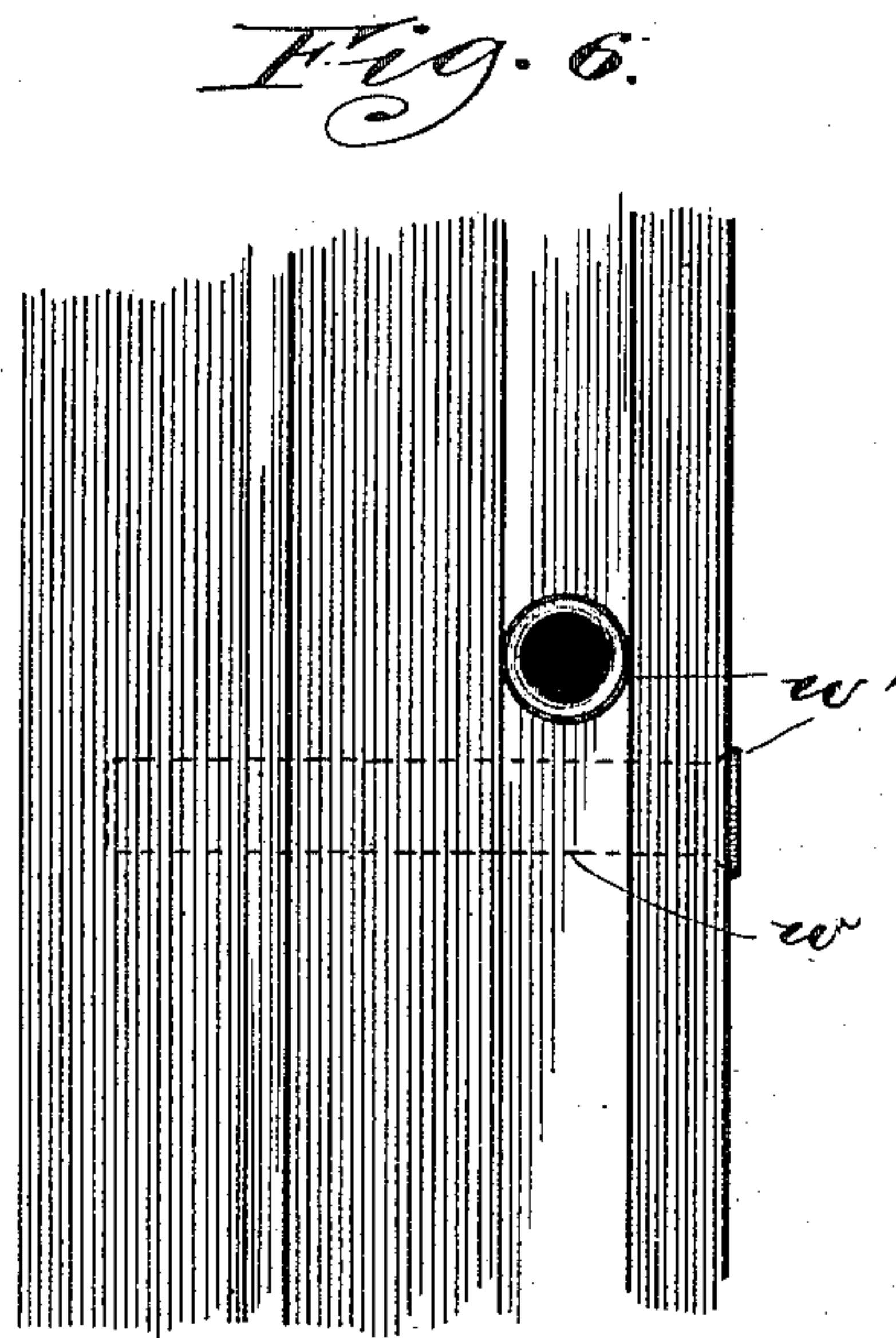
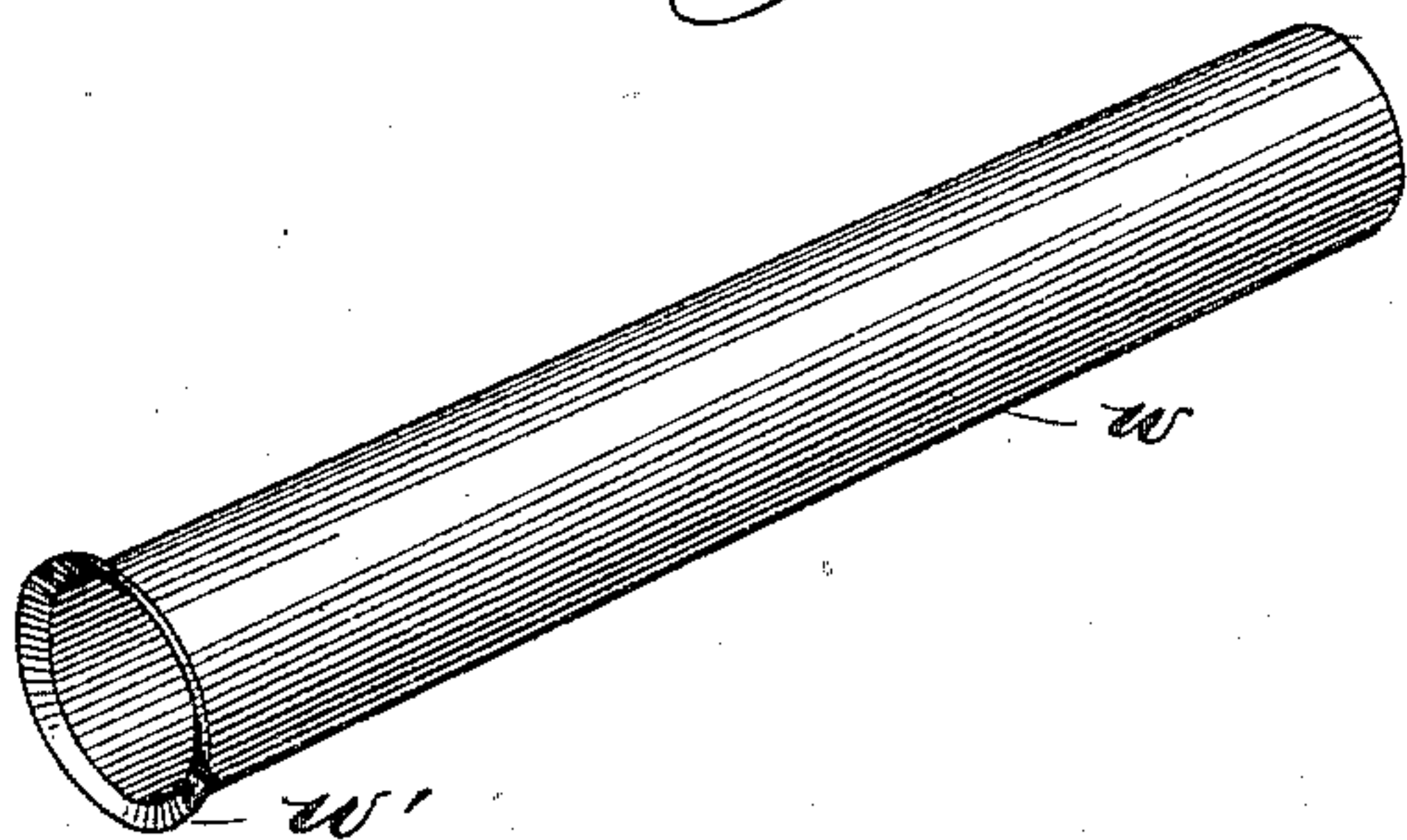
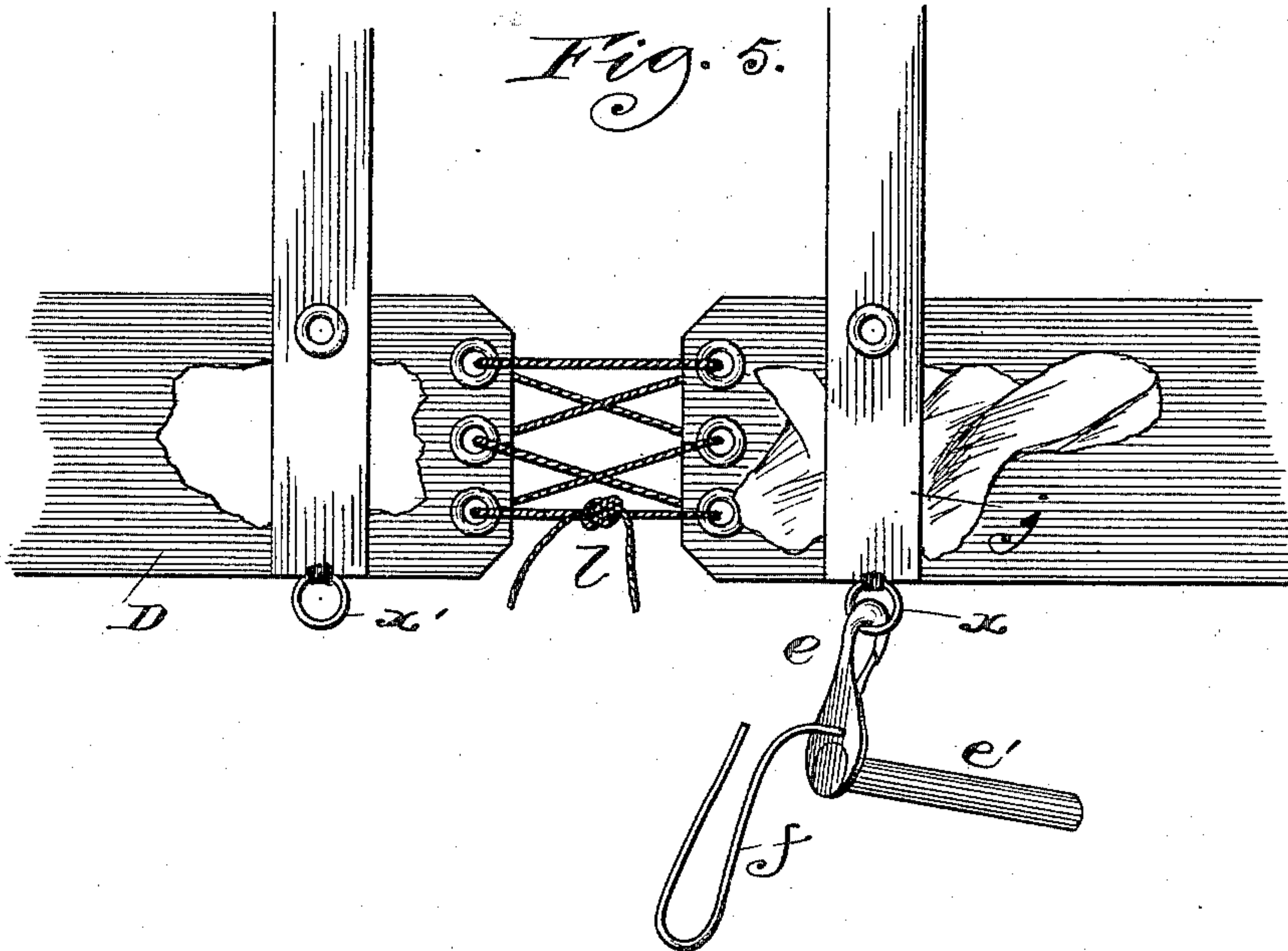
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SAFETY APPARATUS FOR WINDOW CLEANERS.

No. 474,586.

Patented May 10, 1892.



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# UNITED STATES PATENT OFFICE.

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## SAFETY APPARATUS FOR WINDOW-CLEANERS.

SPECIFICATION forming part of Letters Patent No. 474,586, dated May 10, 1892.

Application filed September 28, 1891. Serial No. 407,082. (No model.)

*To all whom it may concern:*

Be it known that I, HIRAM K. WHITNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Safety Apparatus for Window-Cleaners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in safety apparatus, and is generally adapted to the safety of window-cleaners and portable fire-escape purposes.

The object of my invention is to produce a cheap foot-rest and anchorage for persons engaged in cleaning windows and like occupations or for use in connection with a portable fire-escape.

My invention consists in the construction and arrangement of parts, as hereinafter set forth, and also in the combinations, as described, and shown in the accompanying drawings, in the several views of which similar letters of reference indicate like parts.

Figure 1 shows my safety apparatus attached to one side of a window-frame, giving in full view its detail. Fig. 2 shows an anchorage formed in the window-frame when the outer casing is formed of iron or covered by terra-cotta, &c. Fig. 3 shows a balcony or foot-rest to be attached to the window-frame and sill and to be used in combination with the apparatus shown in Fig. 1. Fig. 4 is a sectional view of Fig. 3 through the line  $z z$ . Fig. 5 is an enlarged view of a portion of the front of Fig. 1 as it appears when laced about the person of a window-cleaner. Fig. 6 shows bushings driven into the window perforations. Fig. 7 shows the detached bushing as an article of manufacture.

In said accompanying drawings, Fig. 1 shows a safety apparatus as preferably constructed. A and B are rope-terminal irons.  $a$  is a bolt or shank about four and one-half inches long, to be inserted into hole  $a'$ , bored into the so-called "outer" casing of the window-frame. Arm  $b$  projects horizontally outward beyond the outer face of the hanging-stile  $b'$ , then bent perpendicularly downward, forming a short shank  $c$ , and ending in a

thimbled ring  $d$ , to which latter stay-rope C is spliced. While said rope-terminal iron is but an element of this invention, its shank  $c$  immediately above the thimbled ring is the key-point in each modification.

In Fig. 1 key-snap  $e$  is mounted upon or is a continuation of a cross-bolt  $e'$ , placed into the window-frame relatively to bolt  $a$  of the rope-terminal iron. The hole bored for said key-snap bolt  $e^2$  passes, as shown, from without inward through hanging-stile  $b'$ , and next through the outer casing into and partially through the pulley-stile, as nearly as possible at right angles to and about one inch below rope-terminal-iron hole  $a'$  and a total depth about equal to the latter. It will readily be observed that when said cross-bolts  $a$  and  $e'$  are inserted in their respective holes  $a'$  and  $e^2$  and the key-snap  $e$  of the one is made to interlock with shank  $c$  of the other an anchorage of absolute safety and simplicity is effected.

A and B in Fig. 1 show, respectively, right and left terminal irons. In anchorage B is shown pail-hook  $f$ .

Various forms of belts have been suggested in combination with so-called "permanent window-fixtures"—that is, eyebolts and staples; but for the purpose of this invention I use a jacket D, made of two folds of strong canvas or ducking.

$g$  and  $g'$  are slits in the outer canvas, forming a ropeway at the back between the two layers of canvas, through which the stay-rope C passes freely. Said ropeway is reinforced by leather strips, rivets, &c.; also by extending the shoulder-straps  $h$  and  $h'$  down the back of said jacket. At the front the shoulder-straps form loops or pockets  $j$  and  $j'$  for cloths and sponges. Rings  $x$  and  $x'$  are key-snap holders while moving from window to window. Grommets  $k k k$  and  $k' k' k'$ , with the lacing-cord  $l$ , afford a means for securing the jacket about any-sized body.

Fig. 5 shows the pocket  $j$  holding the cleaner's cloth when not in use. From the key-snap holder  $x$  is seen suspended a key-snap with its pail-hook  $f$ . Fig. 5 furthermore shows the method of lacing said jacket when placed about the person of the window-cleaner.

It will not be a departure from the spirit of this invention to mount key-snap  $e$  upon



shank *c* of the rope-terminal iron, as shown in Fig. 2. Here key-snap *e*, through the medium of its swivel connections with shank *c*, is made to readily engage with eyebolt *m*.  
 5 The latter is screwed into the outer casing about two inches below the rope-terminal hole *a'*. This anchorage is an admirable substitute for the anchorage hereinbefore described, when, as is sometimes found in practice, that  
 10 terra-cotta, bricks, or stone trimmings supplant the so-called "hanging-stile" *b'*. In any event this latter anchorage is best adapted to the purposes of a portable fire-escape, inasmuch as there are no detached parts to be  
 15 lost in the excitement naturally attending such practical application of this invention. In every modification in practice the strain will fall upon the rope-terminal iron. Very little force is exerted upon the retaining key-  
 20 snap. Another fact should be noted in this connection. In every instance of mishap, as when the operator loses his footing and in making a descent in escaping from a burning building, the strain upon the bored outer  
 25 casing is not such as would tend to split said bored outer casing, because the lever force exerted upon the rope-terminal iron is in the direction of the grain of the wood and not across it.

30 Fig. 3 is another modification embodying but a single improved anchorage, as above. The opposite terminal of the rope *C* is a simple snap-hook *n*, made to engage with a link or ring *n'* in a self-adjusting portable balcony,  
 35 preferably constructed as follows: *o* is a foot-rest or platform having an iron guard or back *p*, supported at a suitable height by the braces *q q q* and *p'*, the latter being a termination of the back carried downward in a curve and  
 40 ending in a foot *q'*. The opposite termination of said back *p*<sup>2</sup> is a bolt for insertion into a hole bored at a proper height into the outer casing. Near the foot *q'* is a slotted plate *r*, adapted to engage with a strong wood-screw  
 45 permanently screwed into the sill of each window. The enlargement *r'* will admit the head of said screw *r*<sup>2</sup>, while slot *r*<sup>3</sup> engages with the shank of said screw. Hinged to the under side of the foot-rest or platform of the  
 50 balcony proper is a clamping-board *s*. To the free edge of the latter is attached a notched bar *t*. Catch-plate *u* is fitted to the back edge of said foot-rest under the back with reference to its proper engagement with notched  
 55 bar *t*.

The method of using this self-adjusting balcony combination is as follows: Bolt *p*<sup>2</sup> is inserted into the hole formed in the outer casing, (forming an admirable brace because of its  
 60 height,) with the clamping-board *s* in close contact (parallel) with the platform proper. The enlargement *r'* is slipped over the head of the permanent screw *r*<sup>2</sup>. This end of the platform is now swung outward until the  
 65 shank of the screw reaches the end of the slot. The clamping-board *s* is now released and allowed to drop into contact with the

stone sill of the window. The notched bar is made to engage automatically with catch-plate *u*, and the whole is immovably clamped  
 70 into position, no matter what height or shape the stone bears to the wooden sill of the window. The window-cleaner, with the jacket above described laced about his body, secures  
 75 the anchorage as in Fig. 1, now steps upon the platform, and fastens the opposite terminal (the simple snap) *n* into the link or ring *n'*.

In every modification of this invention involving the jacket, as it does, it is of the utmost importance that the ropeway be so  
 80 constructed that when but one anchorage is effected (which must be done before the operator emerges from the window) the rope will permit the lateral movement of said operator in wide windows, but will not disengage itself  
 85 should the operator lose his footing before the second (the final) anchorage is effected. Knots made upon the rope *C* will adjust said rope to the narrower windows.

It will be found in practice that bushings  
 90 consisting of tubes *w*, trumpet-bell shaped *w'*, shown in Fig. 7 as an article of manufacture, are adapted to be driven snugly into window-frame perforations, as shown in Fig.  
 95 6. Not only do such bushings embellish the window-frames, but they add to the endurance of the said perforations in sustaining the so-called "window-guards," and, furthermore, by means of the bushings of the type  
 100 herein shown, old perforations that may have become treacherous in appearance may be restored by reaming out the decayed surface and then fitted with said bushings.

What I claim, and desire to secure by Letters Patent, is—

1. In a safety apparatus, the combination, with a rope sliding freely in a ropeway secured about the body of a window-cleaner, of the rope-terminal irons, and key-snap bolts adapted to interlock with a window-frame  
 110 bored substantially as and for the purpose set forth.

2. In a safety apparatus for window-cleaners as herein shown and described, the body jacket or belt, the rope and its terminal irons,  
 115 and the bolts and snaps, in combination with the balcony or foot-rest adapted to be secured to the window-frame and sill and connected to the opposite side of the window-frame by means of the sliding rope and its anchorage  
 120 attachments, as set forth.

3. In a safety apparatus, the combination of a window-frame provided with a hole adapted to receive a rope-terminal iron, and a screw-eyebolt attached to the window-frame, adapted  
 125 to engage with a key-snap mounted upon the shorter shank of said terminal iron, substantially as shown and described, as a means of anchorage for window-cleaners and portable fire-escapes.

4. In a safety apparatus, a stay-rope and means to secure said rope about the person of the window-cleaner, a rope-terminal iron, a key-snap and its bolt, and a foot-rest, in com-  
 130



ination with a window-frame bored and its sill provided with a screw or screws, substantially as and for the purpose set forth.

5 5. In a safety apparatus, the combination, with a rope-terminal iron, a key-snap and its bolt, a pail-hook *f*, jacket *D*, and stay-rope *C*, of a window-frame having holes *a'* and *e*<sup>2</sup>, substantially as and for the purpose set forth.

10 6. In a safety apparatus, rope-terminal iron *B*, a key-snap *e*, mounted upon bolt *e'*, and a jacket having pockets, in combination with a window-frame having holes *a'* and *e*<sup>2</sup>, substantially as and for the purpose set forth.

15 7. In a safety apparatus, a jacket having the following elements: a body *D*, ropeway *g* and *g'*, shoulder-straps *h* and *h'*, pockets *j* and *j'*, grommets *k k k* and *k' k' k'*, lacing-cord *l*, and key-snap holders *x* and *x'*, a stay-rope *C*, and rope-terminal irons *A* and *B*, and key-snaps,

in combination with a window-frame having 20 holes *a'* and *e*<sup>2</sup>, substantially as and for the purpose set forth.

8 In a safety apparatus, a portable balcony 25 having the following elements: a platform or foot-rest *o*, guard *p* and *p'*, bolt *p*<sup>2</sup>, back braces *q q q*, foot *q'*, slot-plate *r*, clamping-board *s*, notched bar *t*, catch-plate *u*, and anchorage-link *n'*, rope *C*, jacket *D*, snap *n*, rope-terminal iron *B*, and key-snap *e*, in combination 30 with a window-frame having holes and a screw *r*<sup>2</sup>, substantially as and for the purpose set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

HIRAM K. WHITNER.

Witnesses:

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F. P. ROSENGARTEN.