

No. 718,948.

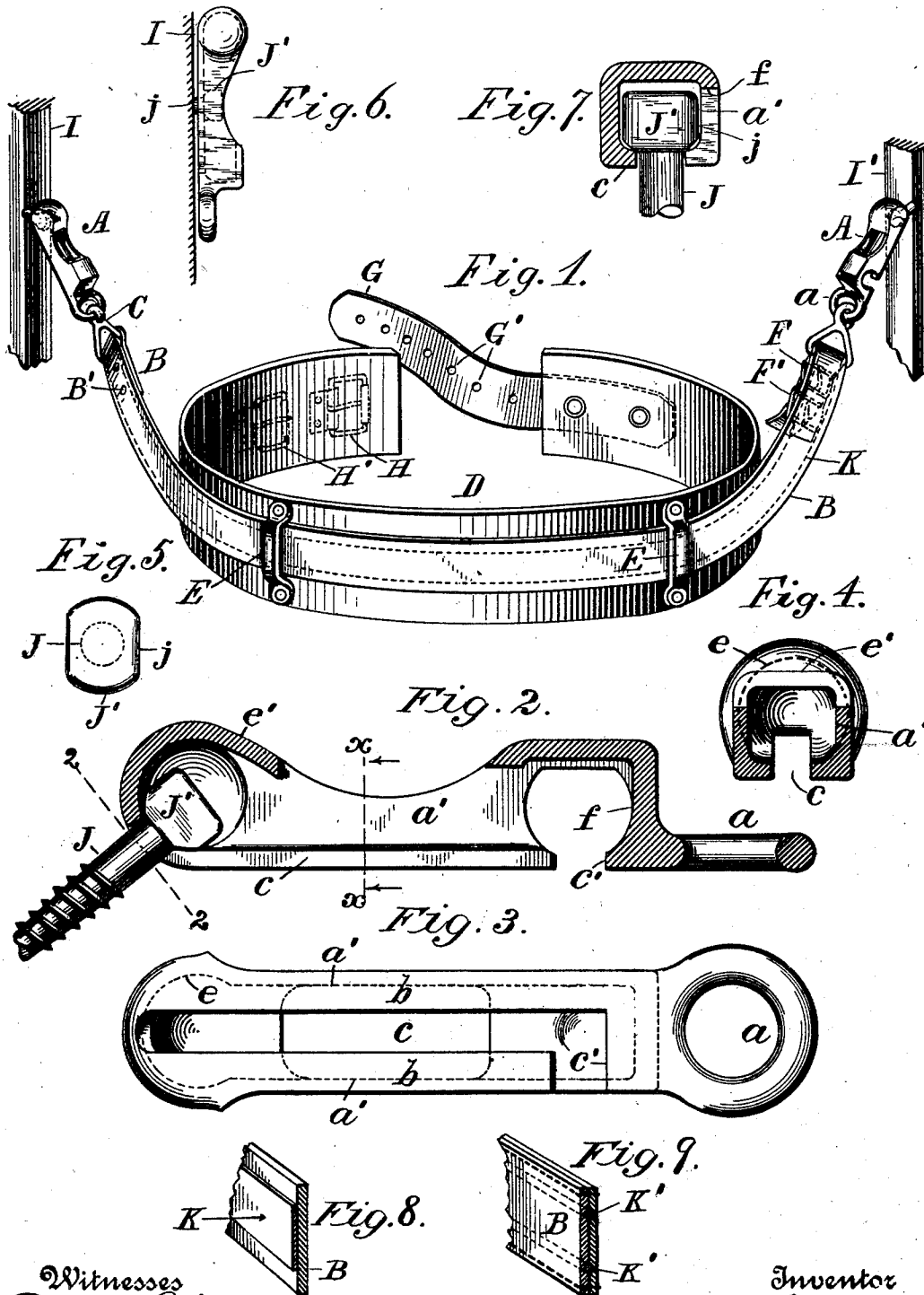
PATENTED JAN. 20, 1903.

J. K. GREEN.  
SAFETY SUPPORTING APPARATUS.

APPLICATION FILED APR. 16, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses  
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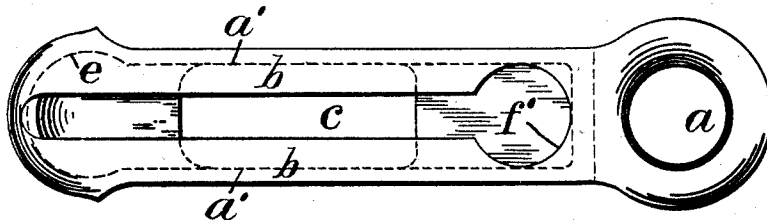
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NO MODEL.

2 SHEETS—SHEET 2.

*Fig. 10.*



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# UNITED STATES PATENT OFFICE.

JOHN K. GREEN, OF NEW YORK, N. Y.

## SAFETY SUPPORTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 718,948, dated January 20, 1903.

Application filed April 16, 1902. Serial No. 103,138. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN K. GREEN, a citizen of the United States, residing at 144 West Eighty-second street, New York, county of New York, State of New York, have invented certain new and useful Improvements in Safety Supporting Apparatus, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of the present invention is to furnish an improved clip or fastener for securing a safety apparatus detachably to a fixed point, and also in the combination, with such clip or fastener, of a safety strap and belt adapted especially to support a workman upon the outside of a window, as when cleaning or repairing the same. In a belt for window-cleaners it has been common heretofore to furnish the ends of the belt-strap with slotted plates adapted each to engage a couple of bolt-heads projected from the window-frame, the accidental displacement of the slotted plate from the bolt-heads being prevented by a spring upon the plate. Such spring is liable to become broken and often does become broken in practice, and nothing then prevents the accidental release of the plate from the bolt-heads by any upward blow or force.

It is one object of the present invention to construct a clip in such manner that only one bolt is required to hold it securely to the fixed support, and its connection with the bolt-head is such that it cannot be accidentally dislodged from the same, but requires a series of movements to disengage it, which cannot be imparted to it by accident. Where the clip is used in connection with a workman's belt, a single bolt is provided upon each side of the window-frame, and two of the clips to engage such bolts are connected by a strap which I reinforce by means of a flexible metallic band. The metallic band is extended (with the strap) through links which connect the strap to the clip and folded over with the strap and secured firmly to hold the strap to the link. The fold is commonly secured at one end by rivets and is secured adjustably at the opposite end by means of a buckle. To furnish a double security and prevent loss of life through the breaking of a single

buckle, I extend the strap and metallic band through two buckles, so as to secure absolute safety. The belt is furnished with metallic loops, through which the strap is extended, and such loops are made of sufficient strength to support each the entire weight of the workman in case the band is broken by any accident from one of the clips. The belt is furnished with a tongue and buckled to secure it upon the workman's waist, and to furnish security from accident in case one buckle should break I provide two buckles upon the belt and I arrange the holes in the buckles to engage the pin-tongues of both buckles simultaneously, thus obtaining absolute safety in the securing of the belt.

In the annexed drawings, Figure 1 is a perspective view of the belt and its fastenings. Fig. 2 is a longitudinal section of the clip attached to the bolt, with dotted line 2 2 indicating the face of the woodwork in which the bolt is secured. Fig. 3 shows the under side of the clip; Fig. 4, a cross-section on line *xx* in Fig. 2; Fig. 5, the head of the bolt; Fig. 6, a diagram showing the disengagement of the clip from the bolt, and Fig. 7 a cross-section of the clip with bolt-head in its channel. Figs. 8 and 9 show the strengthening-band for strap B. Fig. 10 is a view like Fig. 3, showing an alternative location for the slot-opening.

In Fig. 1 the clips (marked A) are shown attached to window-frame bars I I' and connected with the strap B by links C, and the belt D is provided with the loops E, through which the strap is extended. Each of the loops is made of sufficient strength and suitably fastened to the belt to sustain the whole weight of the operator if the strap should become detached from either of the clips and should slip in the loops until the buckle or fold at the end of the strap should prevent further movement. The strap is provided with two buckles F and F', and the holes in the end of the strap would be spaced at the same distance apart as the pin-tongues of the buckles to engage them simultaneously. The belt D is shown with tongue G and with two buckles H H', the holes G in the tongue being spaced to engage the pin-tongues of the buckles simultaneously, so that such pin-tongues unite in supporting the load.

The metallic band may be made of a flexi-

ble flat ribbon K, as shown in Figs. 1 and 8, such as is already well known, and made with special flexibility, in which case the band may be secured to one side of the strap, as shown in Fig. 8, and extended through the eye of the link C with the strap B and secured, as well as the strap, by the rivets B'. The metallic band would also be extended with the strap through the buckles F F' and punched, like the strap, to fit the pin-tongues of the buckles. The metallic band may also be made of round wires K', as shown in Fig. 9, in which case the strap would be formed of two layers of leather or fabric secured together with the wires in grooves between them, the arrangement of the wires near the opposite edges of the strap permitting the holes for the buckle-tongues to clear the wires.

Where wires are used, they are securely fastened at the ends of the strap, so as not to pull out from between the layers. Such reinforcement of the strap greatly increases its strength and reduces the liability to the loss of security by age and wear, which would affect leather or canvas more rapidly than metal. The belt and the supporting-strap are thus made absolutely safe to support the workman.

I I' designate the opposite sides of a window-frame, and J a bolt therein having head J' of greater width across the corners than the sides, as shown in Fig. 5. Such form is secured, with the construction shown in the drawings, by making a round head with opposite sides *j* flattened.

The clip (designated A in Fig. 1) is shown with eye *a* at one end to engage a link C or any other required connection. The clip is formed with flat sides *a'* and bottom *b*, having longitudinal slot *c* to clear the neck of the bolt. The slot opens into the channel between the sides *a'* and is closed at both ends and the sides *a'* arranged to just clear the parallel sides *j* of the bolt-head. An expansion of the channel is made at the end of the slot opposite to the eye *a* to form a socket *e* of sufficient width to turn freely upon the entire bolt-head, and the clip is thus prevented from turning when fitted upon the bolt-head, except the clip is moved to bring the socket *e* over the bolt-head. At the end of the slot opposite the socket *e* a lateral opening is provided to discharge the bolt-head from the slot, and such opening may be made in one of the sides *a*, as shown in full lines at *f* in Fig. 2, or in the bottom plate of the clip, as shown in Fig. 10, where the opening (marked *f'*) is made circular to admit the head of the bolt. Where the opening *f* is made in the side *a'*, a transverse slot *c'* is required to extend from the slot *c* to the lateral opening *f*; but the opening *f'* when formed in the bottom of the clip would connect directly with the slot *c*, as it is in direct line with the same.

The lateral opening *c'* furnishes what may be termed a "bayonet-lock," which requires a

lateral movement of the clip upon the bolt-head before it can be moved longitudinally to bring the bolt-head into the socket *e*.

The bolt-head is projected but little from its support, (as the window-frame I I'), and it is obvious that the clip cannot be applied to such bolt-head except by placing the clip flat against the window-frame or bolt-support, as shown in Fig. 6, to enter the bolt-head into the slot. The clip then requires to be held parallel with the support to move the socket *e* to the bolt-head, after which the clip may be freely turned to any angle or in any position relative to the bolt-head, as indicated in Fig. 1, and by the relation of the clip to the line 2 2 representing the window-frame or bolt-support in Fig. 2.

The formation of the bolt-head with flattened sides and the formation of the channel between the sides *a* of the clip to nearly fit such flattened sides, as shown in Fig. 7, cause the clip to cramp if bent or drawn laterally when the bolt-head is in such channel, and such tendency to cramp affords a great security against accidental displacement of the clip from the bolt-head, as the free swinging of the clip upon the bolt-head would prevent it from assuming a position in which it could be moved not only parallel with the window-frame, but parallel with the flat sides of the bolt, both of which relations are necessary to dislodge the clip from the bolt.

From the above description it will be seen that the clip is adapted to operate with a single bolt-head and assumes any position that the strap or load may require, as is shown in Fig. 1, to pull straight from such bolt-head, whereas when a clip or support is attached by means of two bolt-heads it is held by the joint operation of such heads close to the wood all the time and is strained laterally by the tension upon the strap.

In my construction I can make the eye *a* flush with the bottom side of the clip in which the slot *c* is formed, and the pull is then in a direct line with the bolt and the eye is not deformed by the strain.

In Fig. 2 the lateral opening *f* appears to greatly weaken the side of the clip; but such opening is formed only in one side, leaving the other side solid, as shown in Fig. 6, which fully supports the strain upon the sides. By forming the lateral opening in the bottom of the clip, as indicated by the dotted circle *f'* in Fig. 3, the perforation or weakening of the sides is wholly avoided. The load thrown upon the clip is imposed upon the outer corners of the bolt and the outer end of the socket *e*, as shown in Fig. 2, and to strengthen the socket a cap *e'* is formed over its outer portion and serves as an integral bridge between the sides *a'* to transmit the strain fully thereto.

From the above description it will be seen that complete security from accidental displacement is secured by the construction of

the clip, security from rupture is secured by the metallic reinforcing of the strap, a secure attachment of the strap to the belt is secured by making each of the eyes *E* strong enough to support the whole load upon the belt, and that the attachment at the end of the strap and belt is made doubly secure by the use of two buckles and the formation of the holes in the strap or belt-tongue to simultaneously engage the two buckle-tongues. My invention thus affords elements of security not known in other constructions.

When properly formed, the bolt-head and the socket *e* form a ball-and-socket joint, upon which the clip can turn freely in any direction, and to secure such operation most perfectly and avoid unnecessary wear of the socket *e* the under side of the bolt-head is formed spherical, as indicated in Figs. 2 and 7, and thus bears equally upon the inner side of the socket at the edges of the slot *c*. Such ball-and-socket joint affords a more perfect bearing for the strain and secures greater durability in the wear of the parts.

Having thus set forth the nature of the invention, what is claimed herein is—

1. A safety supporting-clip having the eye *a* at one end, sides *a'* with longitudinal channel between the same, the longitudinal slot *c* connecting with such channel, with lateral opening adjacent to the eye *a* to introduce a bolt-head, and the channel at the end opposite to the eye *a* enlarged to form the socket *e*, to permit the clip to turn upon the bolt-head.

2. In a safety supporting device, the combination, with a bolt-head having parallel sides, of a supporting-clip having the eye *a* at one end, the sides *a'* having channel fitted to the sides of the bolt-head and the slot *c* to clear the neck of the bolt, the slot having a lateral opening to introduce the bolt-head to the channel, and the channel being formed at

the end opposite to the eye *a* with the enlarged socket *e* to clear the corners of the bolt, whereby the clip can be turned in any position thereon.

3. A safety supporting-clip having the eye *a* at one end, a longitudinal channel adapted to fit the sides of a single bolt-head, with longitudinal slot opening into one side of such channel, and having the enlarged socket *e* at one end of the channel to clear the corners of the bolt-head, and a lateral opening at the other end of the channel to introduce the bolt-head, whereby the bottom of the clip must be held flat upon the support of the bolt to introduce the bolt-head to the channel and move it to the socket.

4. In a safety supporting device, a safety-clip having the sides *a'* with longitudinal channel between the same, the bottom *b* having the eye *a* extended in a straight line therefrom and the longitudinal slot *c* connecting with the channel and having the enlarged socket *e* at one end, and the slot having lateral opening adjacent to the eye *a* to introduce a bolt-head, substantially as herein set forth.

5. In a safety supporting device, the combination, with a bolt-head having spherical base, of a clip having an eye *a* at one end, a longitudinal slot to pass the neck of the bolt, with opening adjacent to the eye to introduce the bolt-head, and at the opposite end of the slot a spherical socket adapted to bear upon the spherical surface of the bolt-head, whereby the strain upon the bolt is uniformly distributed in all positions of the clip.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN K. GREEN.

Witnesses:

L. LEE,

THOMAS S. CRANE.