T. P. FORSYTH.

Fire-Escape.

No. 161,113. Patented March 23, 1875.

Fig. 1.

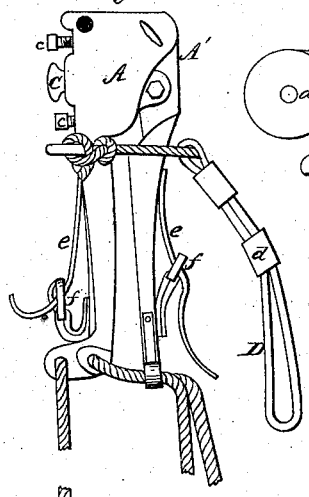


Fig. 2.

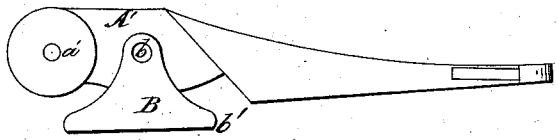


Fig. 3.

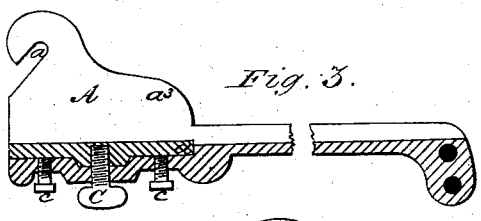


Fig. 4.

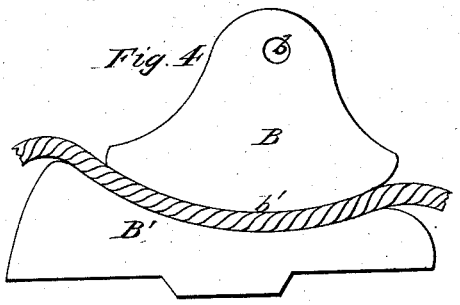


Fig. 8.

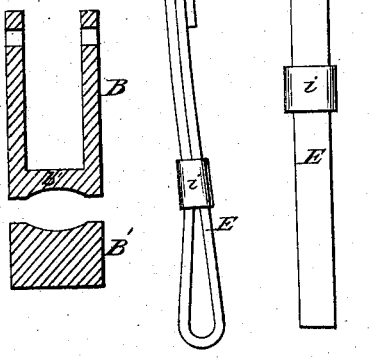


Fig. 5.

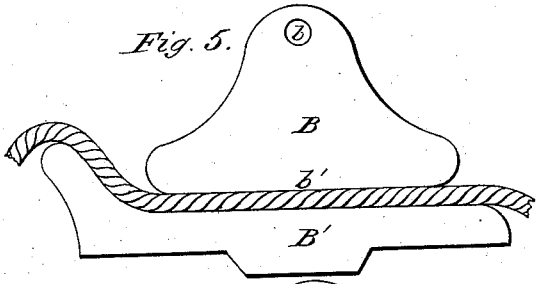


Fig. 6.

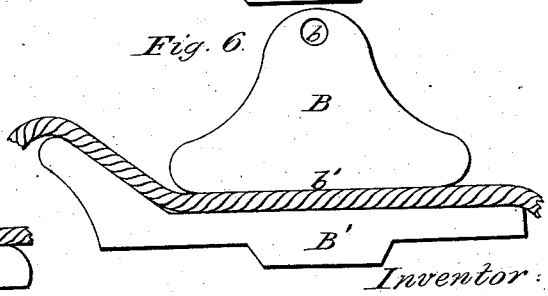
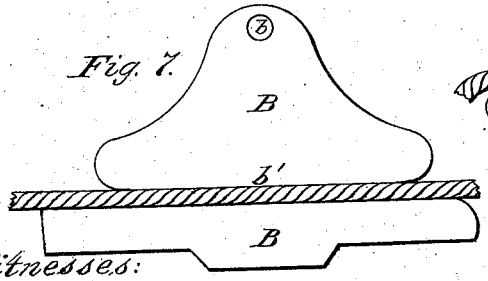


Fig. 7.



Witnesses:

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UNITED STATES PATENT OFFICE.

THOMAS P. FORSYTH, OF NEW HAVEN, PENNSYLVANIA.

IMPROVEMENT IN FIRE-ESCAPES.

Specification forming part of Letters Patent No. **161,113**, dated March 23, 1875; application filed January 26, 1875.

To all whom it may concern:

Be it known that I, THOMAS P. FORSYTH, of New Haven, in the county of Fayette and State of Pennsylvania, have invented a new and useful Improvement in Fire-Escapes; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings forming part of this specification, in which—

Figure 1 is a view of my improved clamp, showing the manner of securing the hand to the clamp and the foot to the stirrup. Fig. 2 is a clamping lever or jaw, showing in dotted lines the pivoted bit or clamping piece. Fig. 3 is a sectional view of a jaw, showing the manner of securing the detachable bits rigidly to the clamping-jaw, and also the manner of adjusting the bits. Figs. 4, 5, 6, 7, and 8 are detached views of pivoted and fixed clamping pieces or bits, showing some of the various forms which may be given to the faces of the bits.

Like letters refer to like parts whenever they occur.

My invention relates to that class of articles known as fire-escapes or clamps for ascending or descending a rope or cable; and it consists, first, in forming the jaws or clamping-levers with detachable and adjustable bits or clamping pieces pivoted or otherwise attached to the jaws, so as to adjust themselves to the rope; secondly, in detachable bits or clamping pieces, which can be rigidly secured to the clamping jaws or levers by means of set-screws or similar suitable devices, whereby they may be changed at will to obtain various-shaped clamping-surfaces; thirdly, in providing the clamp with loops, straps, or similar devices whereby the clamp is secured to the hand, and may be readily opened and closed; fourthly, in providing the stirrup with a slide or similar device, whereby the stirrup may be readily secured to the foot.

Fire-escapes or clamps for ascending or descending ropes, as at present constructed depend upon the shape of the clamping-surfaces for their hold upon the rope, and in general are of such form as to bend the hempen or similar rope from a right line. While this is practicable with a flexible rope and gives all the gripe required, it is evident that where a wire-rope is to be employed the present devices will only partially meet the requirements, because, as the rope will not accommodate itself to the inequalities of the clamping-surface, the clamping-levers cannot be brought sufficiently close together to be readily managed and controlled; and, furthermore, the inequalities of the rope and clamp interfere with the sliding movement in descending and work injury to both clamp and rope. As wire-rope is conceded to be the most suitable for fire-escapes, whether permanently or temporarily attached to buildings, it is the object of this invention to so construct the clamping devices that they may be readily adapted for use either with wire or other rope, as necessity or desire may dictate.

I will now proceed to describe my invention so that others skilled in the art may apply the same.

A and A′ represent the two clamping jaws or levers, which may be used together to form the clamp. The jaw A may be slotted at *a* to engage with the pivot a^1 upon the end of jaw A′, or the two jaws may be pivoted in the usual way. Instead of making the clamp or biting surface directly on the face of the jaw A′, as heretofore, I pivot to the jaw, by a pivot, *b*, or other suitable means, a separate detachable bit or cam, B, which, from its manner of attachment to the lever A′, is at liberty to adjust itself to the surface against which it is brought. The face *b′* of this bit or cam B will vary in form according to requirements, and, if made of metal, may be chilled or case-hardened, if desired. For use with wire-rope it is preferably grooved longitudinally, as shown in Fig. 8. The clamping lever or jaw A is formed with a recessed or countersunk portion, a^2, for the reception of the detachable clamping piece or bit B′, which is held firmly in place by a set-screw, C, and is adjusted by set-screws *c c* bearing against the under face of the bit B′, so that the clamp may be adapted to wire or other ropes of varying sizes. This bit B′ may be of a shape to conform with bit B, or plain, if desired, and when of metal may be chilled or case-hardened upon its face the same as B. D is a wrist-loop secured to the jaw A, and provided with a slide or similar device, *d*, whereby the clamp may be attached to the user in such a manner as to obviate

any liability of its being dropped. Both of the clamping-jaws A A′ are provided with straps *e e*, secured to the clamps by rivets *l* or otherwise, and having buckles *f*, to enable the loop formed by the strap to be enlarged or contracted at pleasure. Through these straps the thumb and back of the hand are passed, and the clamp is then under the control of the user, so that it may be opened or closed in climbing. The stirrup E is also provided with a slide, *i*, for narrowing the loop and securing the stirrup to the foot.

In the drawings the detachable pivoted clamping-surface is shown attached to one jaw only, and the detachable piece secured by a set-screw to another of two jaws, which, taken together, form the clamping device; but it is evident that the clamping surfaces or bits may be both pivoted, thereby fulfilling one essential of this invention—the adjustability of the clamping surfaces—or may be secured to the jaw by set-screws, thereby fulfilling another essential of my invention—viz., changeable surfaces to adapt the clamp to the rope used—but in general I prefer to use one fixed bit and one pivoted bit.

Figs. 4, 5, and 6 show forms of the bits that may be used with flexible ropes, while Fig. 7 corresponds to those shown in Figs. 2 and 3, and are plain-faced bits, or may be grooved longitudinally, and are adapted more especially for use with wire-ropes, rods, &c.

The two jaws A and A′ being joined either by a key or pivot, or by the slots *a* in A engaging with lugs a^1 on jaw A′, the bit or cam B will enter between the projecting flanges a^3 upon jaw A, and the rope will be griped between the faces of B and B′. The pivoted bit B being at liberty to adjust itself to the line of the rope will allow the jaws A and A′ to be brought closely together, so as to be readily controlled by the operator. The pieces B and B′ may be renewed or changed at pleasure.

The clamps may be provided with stirrup and body belt, as described in Letters Patent No. 155,149, granted to me September 22, 1874.

In using the devices above described, the clamp is secured to the person by slipping the hand through the wrist-loop D and pressing the slide *d* down, after which the thumb and hand are passed under the straps *e* attached to the clamps. This gives the user full control of the clamp. The feet are secured in the stirrup by means of the slide upon the stirrup. The devices may be used for climbing by sliding them along the rope alternately and shifting the weight of the person from one clamp to the other, or a single clamp may be used in descending. In the latter case, if additional weight than that of the user is to be carried, the levers or arms of the clamp should be made proportionably long and strong.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The pivoted clamping piece or bit, in combination with the clamping-levers, and pivoted thereto, substantially as and for the purpose specified.

2. In combination with the clamping-levers, a detachable clamping piece or bit capable of being rigidly attached to the clamping-lever, substantially as and for the purpose specified.

3. A clamping-lever, provided with a pivoted clamping piece or bit, in combination with a clamping-lever having a detachable bit capable of being rigidly secured to said lever, substantially as and for the purpose specified.

4. In combination with clamps A, the strap D, substantially as and for the purpose specified.

5. The stirrup E, provided with the slide *i*, substantially as and for the purpose specified.

In testimony whereof I, the said THOMAS P. FORSYTH, have hereunto set my hand.

THOMAS P. FORSYTH.

Witnesses:
A. B. HOSACK,
JOHN KURTZ.