

(No Model.)

C. M. MITCHELL & G. E. SMALL.
FIRE ESCAPE.

No. 411,869.

Patented Oct. 1, 1889.

Fig 1.

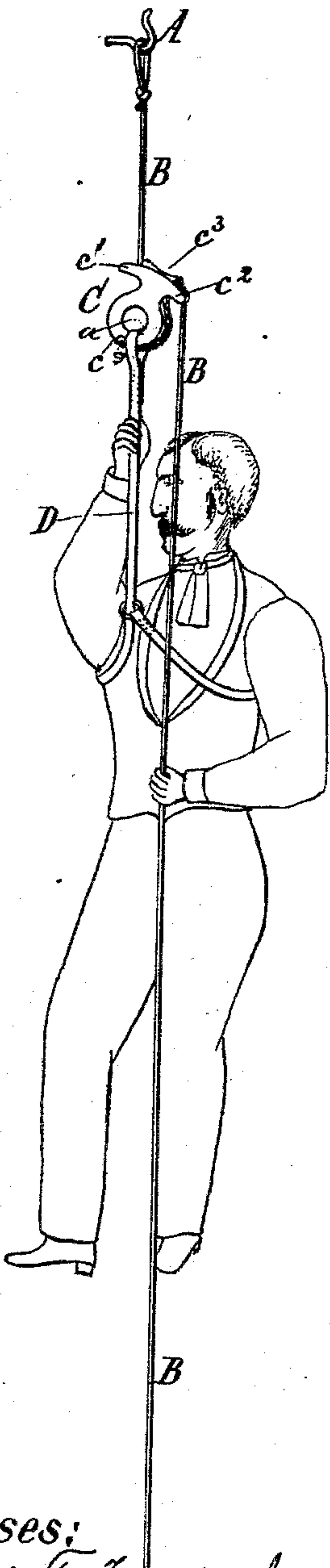


Fig 2.

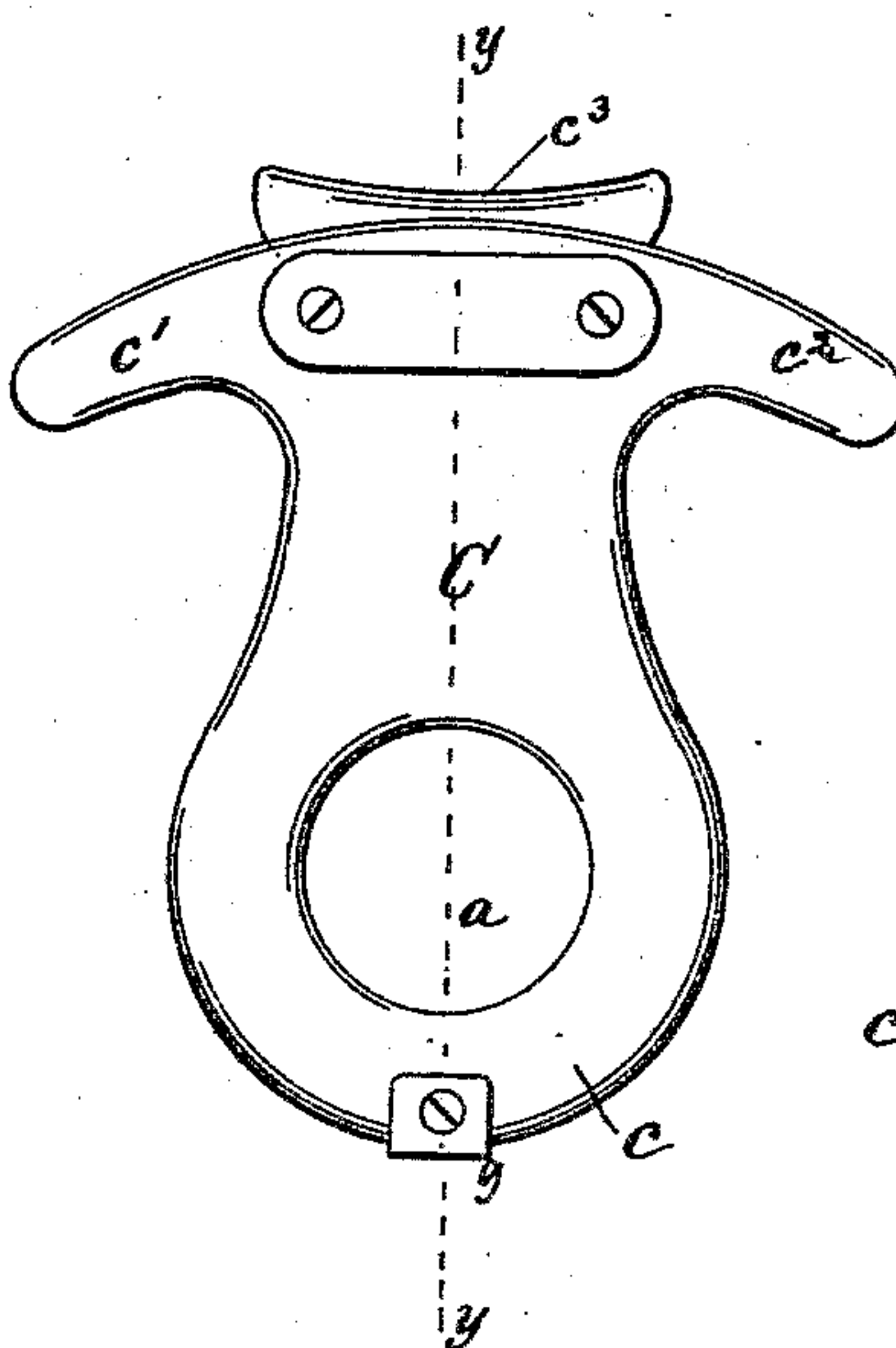


Fig 3.

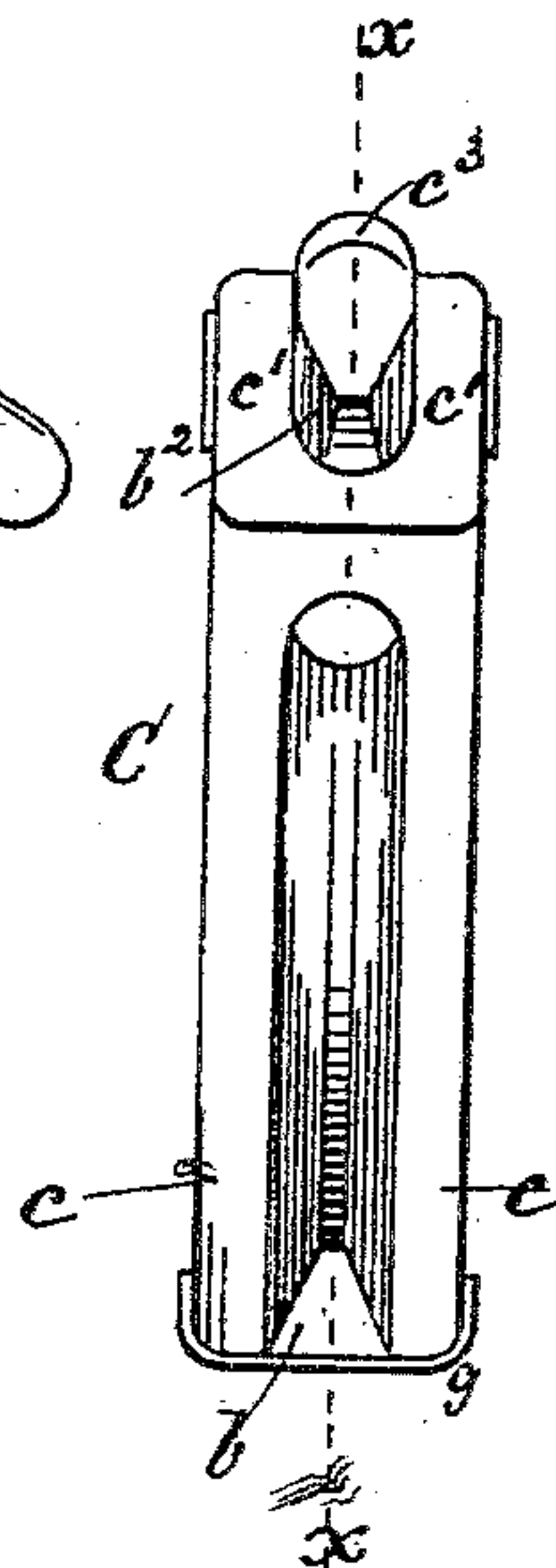


Fig 4.

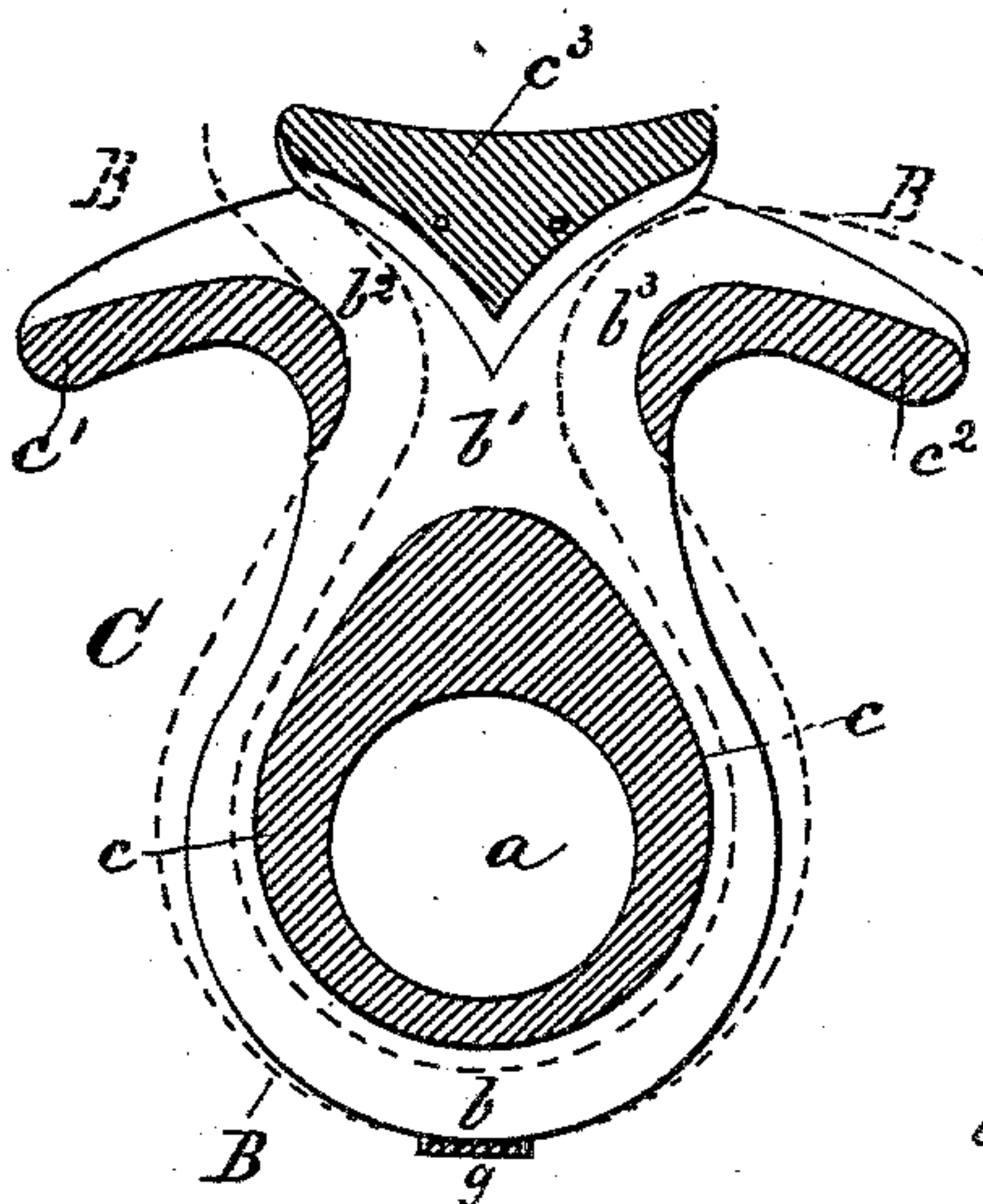
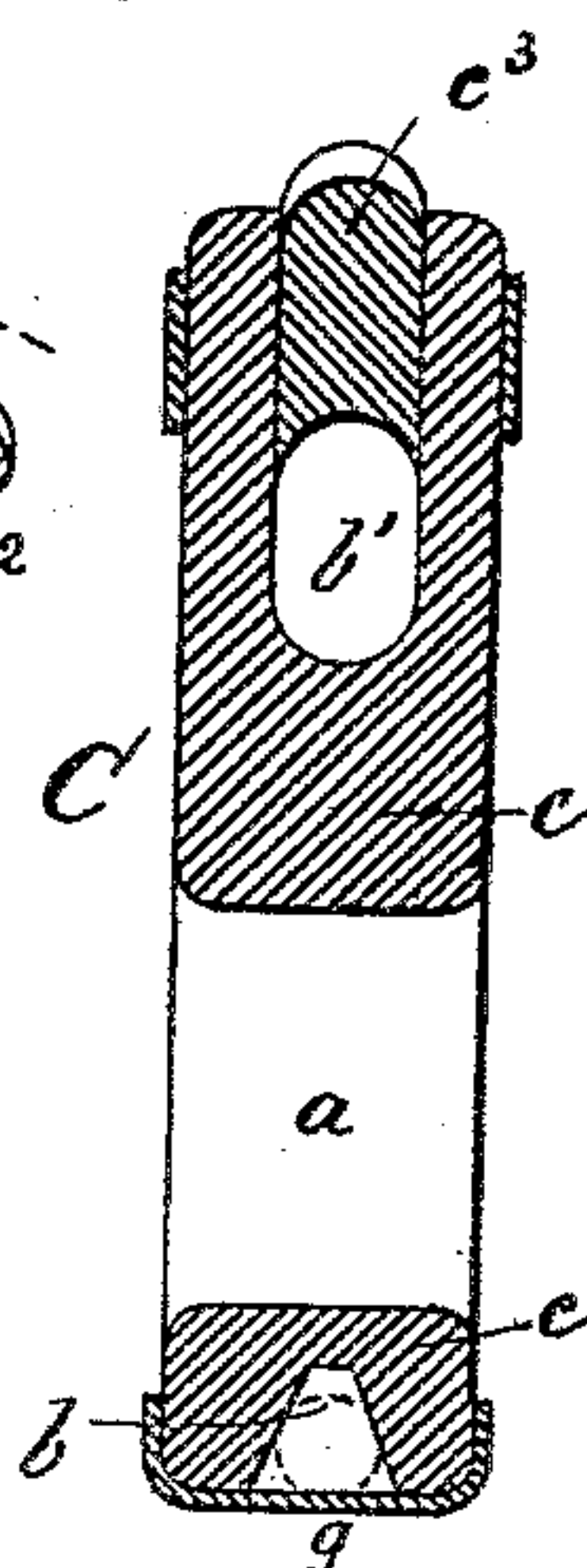


Fig 5.



Witnesses:
Edward J. Fenwick
J. P. Theo. Lang.

Inventor:
Cyrus M. Mitchell
George E. Small
by their Atty,
Mason, Fenwick & Lawrence

UNITED STATES PATENT OFFICE.

CYRUS M. MITCHELL, OF NASHUA, AND GEORGE E. SMALL, OF HUDSON,
NEW HAMPSHIRE.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 411,869, dated October 1, 1889.

Application filed June 13, 1889. Serial No. 314,108. (No model.)

To all whom it may concern:

Be it known that we, CYRUS M. MITCHELL and GEORGE E. SMALL, both citizens of the United States, the former residing at Nashua, in the county of Hillsborough, State of New Hampshire, and the latter at Hudson, in the county of Hillsborough and State of New Hampshire, have invented certain new and useful Improvements in Fire-Escapes; and we 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.

Our invention relates to fire-escapes, upon which persons descend on a wire or other suitable rope suspended from an elevated point of a burning building to the ground; and its object is to simplify and render more certain the operation of the friction device by which the descent is controlled; and the invention consists in a channeled friction-block, through which the rope upon which the descent is effected and by which the block is suspended is rove, said block being of the peculiar construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a perspective view of our invention as it appears when in use suspended from an elevated part of a building. Fig. 2 is an enlarged side elevation of the improved friction-block detached from the rope, and Fig. 3 is an edge view of the same. Fig. 4 is a vertical central section in the line $x x$ of Fig. 3, and Fig. 5 is a section in the line $y y$ of Fig. 2.

A in the drawings represents a hook or staple adapted to be fastened to the window-sill or other firm part of a building; B, a wire or other suitable rope looped or fastened upon this hook and of a length to reach to or nearly to the ground.

C is a friction-block having the rope B rove upon it, as shown; and D is a body-suspending strap, of any suitable construction, connected to the block and adapted to be fastened around the body of a man in any secure manner, as illustrated. The friction-block is best and most effective when made of an oblong form, as shown, as a greater length of

loop or bend in the rope is secured through such form. Through the lower portion of this block a hole a is formed, and the suspending-strap D is passed through it and secured. The outer edge of the perforated lower portion c of the block is of circular form, and this portion is grooved, it having a channel b , which in transverse section is of nearly an A form, as shown. This channel b terminates in a transverse slot b' , formed above the ovate-formed portion c and below two laterally-extended curved wings $c' c^2$ of the block. This slot b' unites with two curved, oblique, or laterally and upwardly divergent channels $b^2 b^3$, which are formed between the wings and a nearly V-shaped central head portion c^3 of the block, as shown.

From an examination of the drawings, Fig. 4, it will be seen that the rope B (indicated by dotted lines) has one of its ends passed, first, through the channel b^2 , then down across the slot b' , and in the channel b around the ovate portion c , up across the said slot b' , and through the channel b^3 , and being thus roved the other or upper end of the rope is fastened to a building, as illustrated in Fig. 1, and its lower end allowed to rest upon the ground. The suspending-strap D, being fastened as before described, hangs down below the block and is adapted to be fastened to the body of a person. The rope B may be kept on the block in the groove by a cross-loop g .

As an equivalent of the block having an ovate-shaped portion and a tapered head portion, and with slot b' between said portions, a block having the central portion of the space or slot b' filled in with a thin web of metal might be adopted, leaving the rope-channel, as shown, otherwise unchanged.

In case of a fire a person in the building fastens the fire-escape to the building, and then fastens himself to the fire-escape by the strap D; and when his weight is brought to bear upon the fire-escape the block will gradually descend upon the rope, its too rapid descent being controlled by the peculiar deflection of the rope from a straight line to a nearly ovate shape or bend, as illustrated by the dotted lines in Fig. 3, and also by the wedging-bind of the rope in the

nearly A-shaped channel around the lower or major portion of the block. In case the descent of the block should from any cause be so rapid as to endanger the safety of the person, or it is necessary for any other purpose to check its speed, this can be instantly done by the descending person grasping the rope B and pulling down hard enough upon it to cause the rope to bind and bite more firmly upon the top surface of wing c^2 and in the wedge or A shaped friction-channel from beginning to end, this operation augmenting the friction to a very great extent, or sufficiently to accomplish the main object—namely, prevent a too rapid descent of the person descending.

From the foregoing description it will be seen that by constructing the friction-block of an oblong form, with a rope-entrance portion at top on one side of the central head portion c^3 and a rope-exit passage at top on the other side of said central head portion, and with a rope-channel extending from one of said passages to the other, outside the ovate portion of the block, a very large friction-surface for the nearly ovate-shaped looped or bent portion of the rope is secured, and this, together with the wedge shape, transversely, of the channel, insures a frictional contact and bind of the block upon the rope sufficient for enabling a person, under ordinary circumstances, descending gradually enough for safety, and when descent is not slow or gradual enough, by a pull with the hand upon the rope on which the block is descending, in a proper direction, an almost positive bite or bind of the block upon the rope, from the beginning to the end of the bend of the rope or along the entire channel of the block, can be produced, and thus the block arrested or the speed of its descent slackened, as described. It will be apparent that the weight of the descending person keeps the block nearly vertical, and that the resistance of this weight and the purchase at the suspending hook or staple will enable the descending person to draw the rope more tightly upon the channeled surface of the block, and thereby wedge

it into the channel and force the entire or nearly entire length of the looped portion or bend in contact with said A-shaped channel-surface of the block, which action upon the rope prevents the block moving as freely as when the hand is withdrawn and simply the indirect travel of the rope and the weight only of the descending person are relied upon for controlling the descent.

By providing two symmetrical wings at the upper end of the block the rope may be rove upon the block on either side; but it is not absolutely necessary that there be more than one wing as long as two passages are provided through the block at its upper end—that is, one passage on the right hand and the other on the left hand of the central head portion.

What we claim is—

1. In a fire-escape, a friction-block C, having a curved lower portion with a groove in its outer edge, a central downwardly-tapered portion c^3 , having a groove in its inner edge, and one or more wings, as $c' c^2$, having, respectively, a grooved inner and upper surface, and said block being also formed with an entrance and exit passage for the rope B at its top, substantially as described.

2. The combination, with a fire-escape friction-block C, having an entrance and exit passage at its top, and formed with a curved lower portion having a groove in its outer edge, a central downwardly-extended portion c^3 , having a groove in its inner edge, and with one or more wings, as $c' c^2$, having, respectively, a grooved inner and upper surface, of a suspending-strap D, applied to the lower end of the block, and a rope B, rove through the block and adapted to be suspended from a fixed part of a building and therefrom extend below the block, all substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

CYRUS M. MITCHELL.
GEO. E. SMALL.

Witnesses:

R. T. SMITH,
B. B. WHITEMORE.