

No. 700,542.

Patented May 20, 1902.

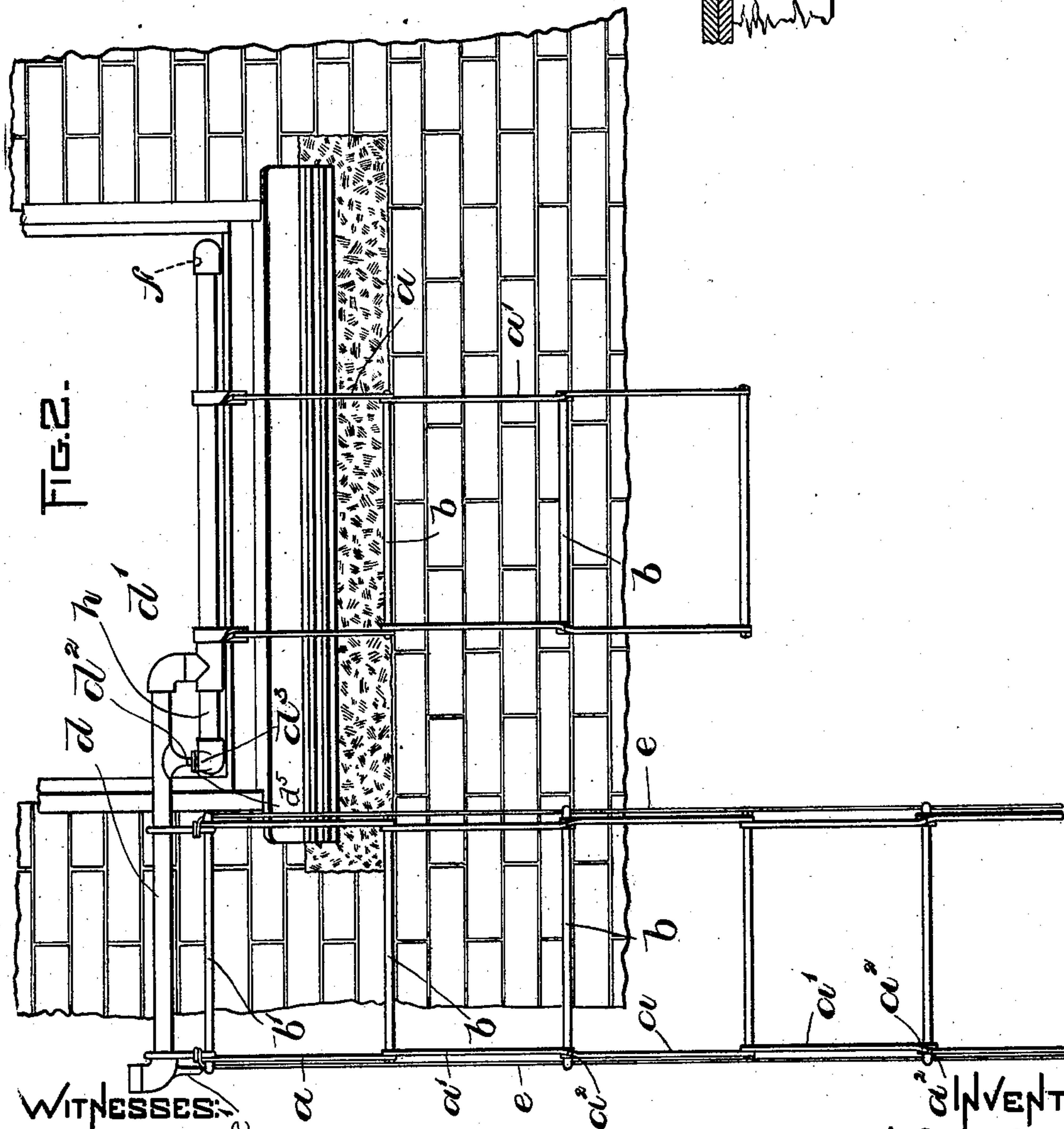
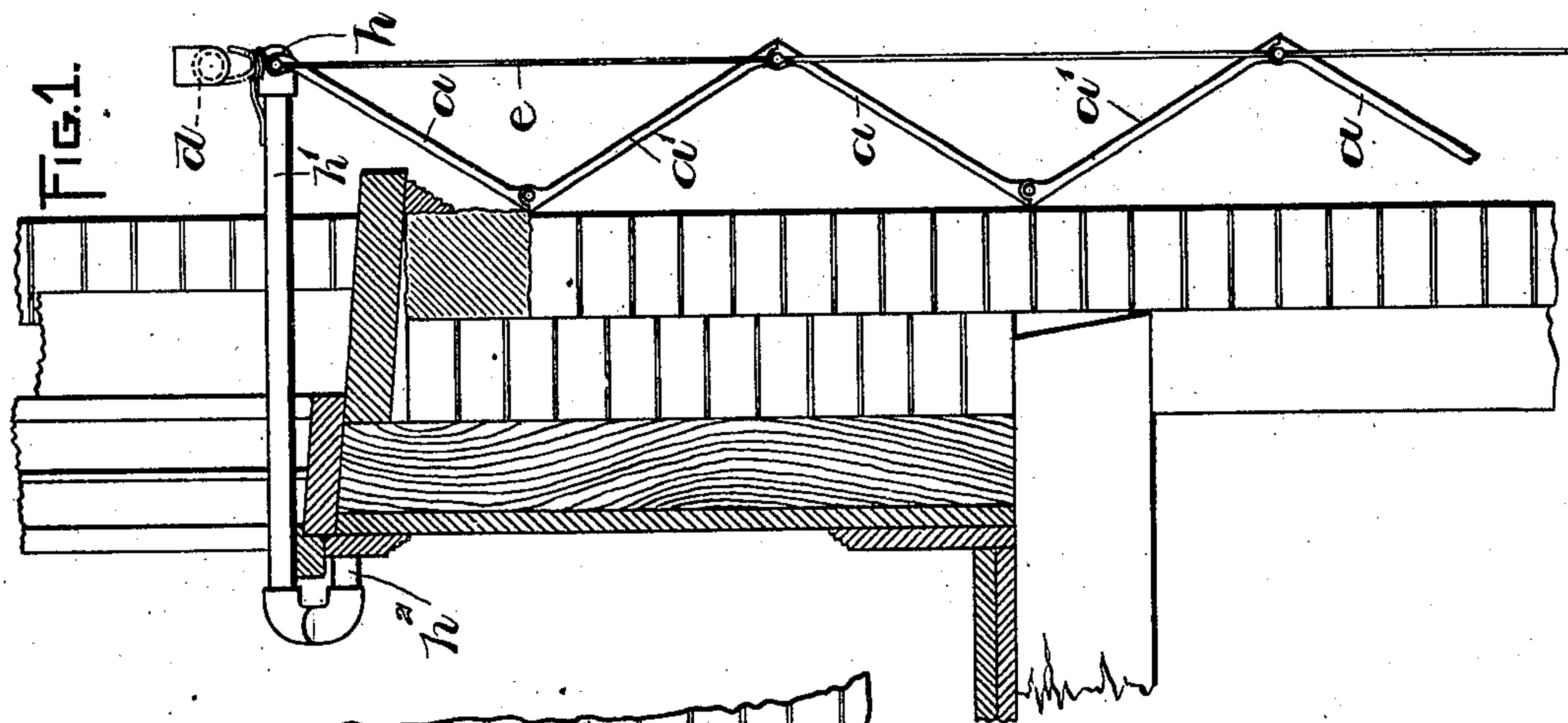
J. C. McCOMBIE.

LADDER.

(Application filed June 15, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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P. W. Pizzetti.

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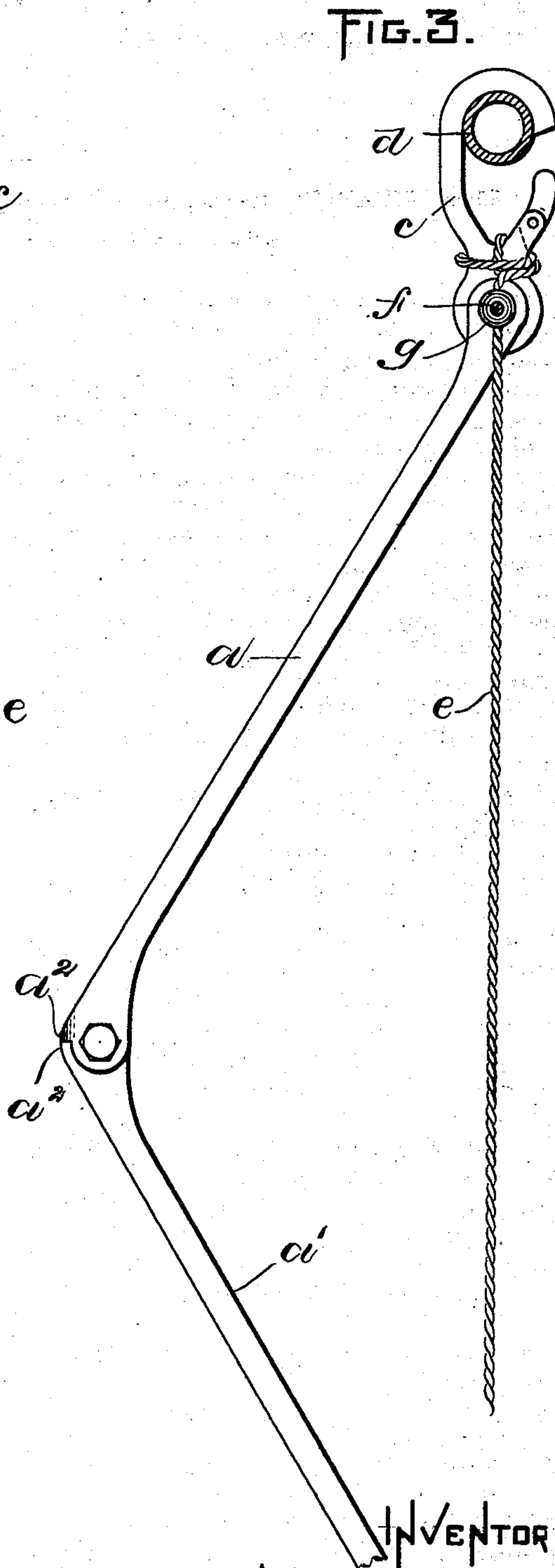
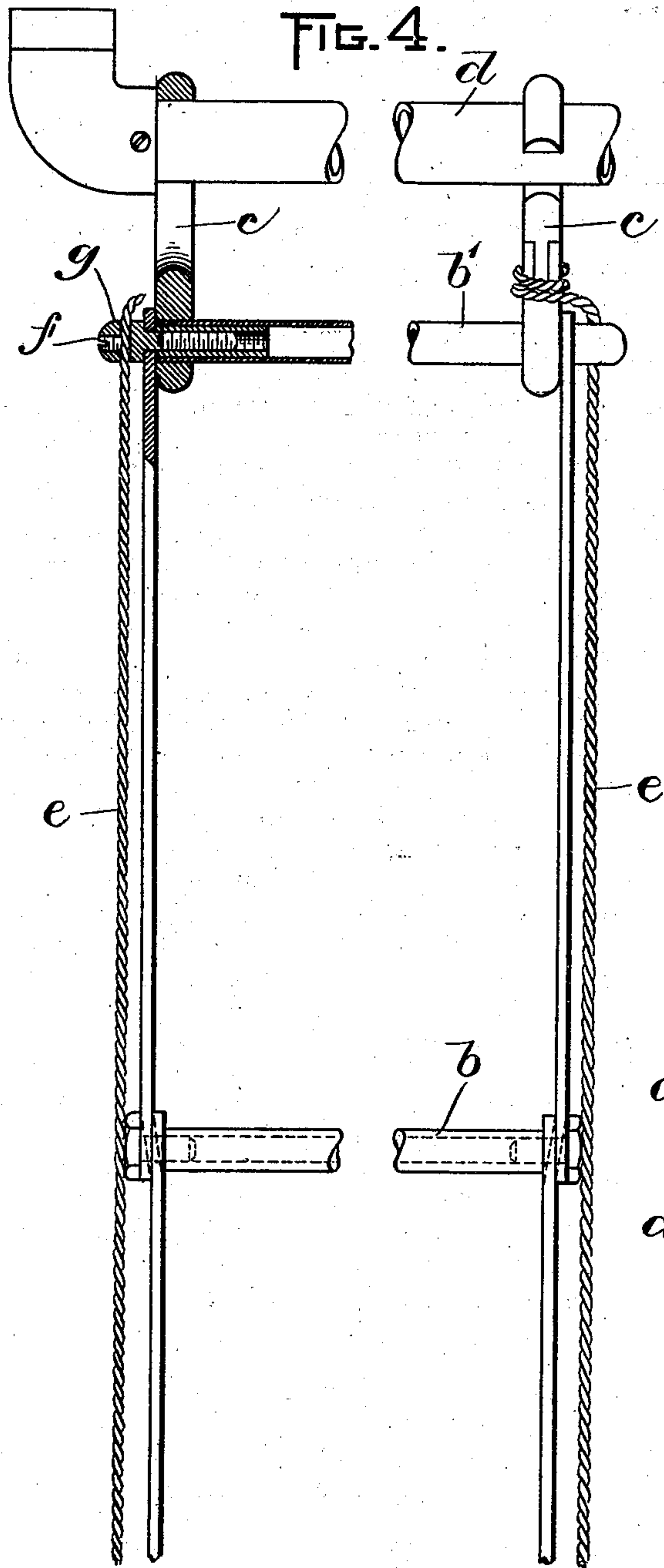
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UNITED STATES PATENT OFFICE.

JOSEPH C. McCOMBIE, OF MALDEN, MASSACHUSETTS, ASSIGNOR OF TWO-THIRDS TO WILLIAM S. JACOBS AND WILLARD E. ROBINSON, OF MALDEN, MASSACHUSETTS.

LADDER.

SPECIFICATION forming part of Letters Patent No. 700,542, dated May 20, 1902.

Application filed June 15, 1901. Serial No. 64,678. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH C. McCOMBIE, of Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Ladders, of which the following is a specification.

This invention has for its object to provide a strong, durable, and convenient ladder adapted to be folded in small compass and to be readily extended from an elevated point on a building and form a series of steps, which are supported by the wall of the building and are sufficiently separated therefrom to enable a person to readily descend the ladder.

The invention consists in the improvements, which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a vertical section of a portion of the wall of a building, showing an edge view of my improved ladder and its support. Fig. 2 represents a front elevation showing the ladder-support adjusted or extended to locate the ladder at one side of the window-opening. Fig. 3 represents an edge view of a portion of the ladder on a larger scale. Fig. 4 represents a side or front view of a portion of the ladder, parts being shown in section.

The same reference characters indicate the same parts in all the figures.

The side bars of my improved ladder are each composed of a series of sections a and a' . The meeting ends of the sections a and a' of each side bar overlap each other and are provided with orifices, so that the said ends constitute hinged socket members, which are jointed together by the end portions of the rungs b , said end portions constituting hinge-pintle members. The sections $a a'$ have abutting stop-shoulders $a^2 a^2$, which are bent laterally from the overlapping portions of the sections $a a'$, so that they abut together, as indicated in Figs. 2 and 3. The arrangement of the stop-shoulders a^2 is such that they come to a bearing each on the other when the sections $a a'$ are in the angular relation to each other, represented in Figs. 1 and 3, so that when the ladder is extended its side bars assume a zigzag form, two series of angles be-

ing thus provided. The inner series of angles rest against the wall of the building from which the ladder is suspended and support the outer series of angles and the rungs engaged therewith at a suitable distance from the wall to permit the ladder to be conveniently used by a person desiring to descend the same. The upper rung b' of the ladder is engaged with the upper sections $a a$ of the side bars and is provided with hooks or suspension devices $c c$ for engagement with a supporting-arm d , hereinafter described.

$e e$ represent flexible inextensible cords, which are preferably made of wire, each cord being continuous from end to end, so that there are no joints or connected ends. The upper ends of said cords are rigidly secured by set-screws f or other suitable means with screw studs or plugs g , secured to and forming parts of the upper rung b' . The said cords are attached in like manner to the alternate hinge-joints of the side bars, as indicated in Fig. 1, the connection between the cord and each of said joints being rigid, so that the cord cannot slip at either of its points of connection. The stretches of the cord between the joints to which it is connected are of such length that when the ladder is extended said stretches will cooperate with stop-shoulders $a^2 a^2$ in preserving the angular relation between the sections of the side bars, the cords relieving the stop-shoulders of a considerable part of the strain that would be exerted upon them if the cords were not employed. The cords being attached to the outer angles of the side bars constitute convenient handles adapted to be grasped by a person using the ladder.

The support for the ladder which I have here shown comprises a bar h , arms $h' h'$, secured to the ends of the bar and made of sufficient length to extend through a window-opening and engage the inner side of the wall, the arms bearing on the sill of a window-opening and supporting the bar h in a horizontal position outside the opening and at a suitable distance from the outer side of the wall, as indicated in Fig. 1. The inner ends of the arms h' are provided with hooks h^2 , which may enter sockets formed for their re-

ception in the wall below the window-opening. The ladder-supporting arm d above referred to is hinged at d' to the bar h , so that the arm d , with the ladder, may be swung horizontally, and thus extended to one side of the window-opening, as shown in Fig. 2. The arm d is provided with a downwardly-projecting foot d^2 , which when the arm is extended, as shown in Fig. 2, bears upon a seat d^3 , formed to support it on the bar h . The seat d^3 has a locking-spring d^5 , having an orifice adapted to engage the bottom portion of the foot d^2 .

e' represents a stud which projects downwardly from the swinging end of the arm d and is adapted to be engaged with a socket f in the bar h . A short ladder of the same construction as that above described and composed of a suitable number of sections a a' and rungs b may be suspended from the bar h .

I claim—

1. A folding fire-escape ladder comprising side bars, connecting-rungs, the side bars being composed of sections which are hinged or jointed to the rungs, and are provided with stop-shoulders arranged to abut together and hold the sections in angular relation to each other when the ladder is extended, and flexible, inextensible cords attached to and ex-

tending between the alternate hinge-joints of the side bars, said cords cooperating with the stop-shoulders in maintaining the angular relation of the sections.

2. A foldable fire-escape ladder comprising side bars each composed of sections having hinge-socket members and stop-shoulders at their ends, rungs extending between said bars their ends constituting hinge-pintle members engaged with said socket members, said stop-shoulders being arranged to abut together when the ladder is extended and hold the side-bar sections in angular relation to each other, whereby outer and inner angles are provided, the inner angles being adapted to bear against the wall of a building and hold the outer angles and the rungs connected therewith at a distance from said wall, and flexible inextensible cords affixed to and extending between the pintle members of the outer angles, said cords cooperating with the stop-shoulders in maintaining the angular relation of the side-bar sections.

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

JOSEPH C. MCCOMBIE.

Witnesses:

WM. S. JACOBS,

LESTER T. MCCOMBIE.