

(No Model.)

2 Sheets—Sheet 1.

A. M. FEURGASON.  
EXTENSION LADDER.

No. 502,290.

Patented Aug. 1, 1893.

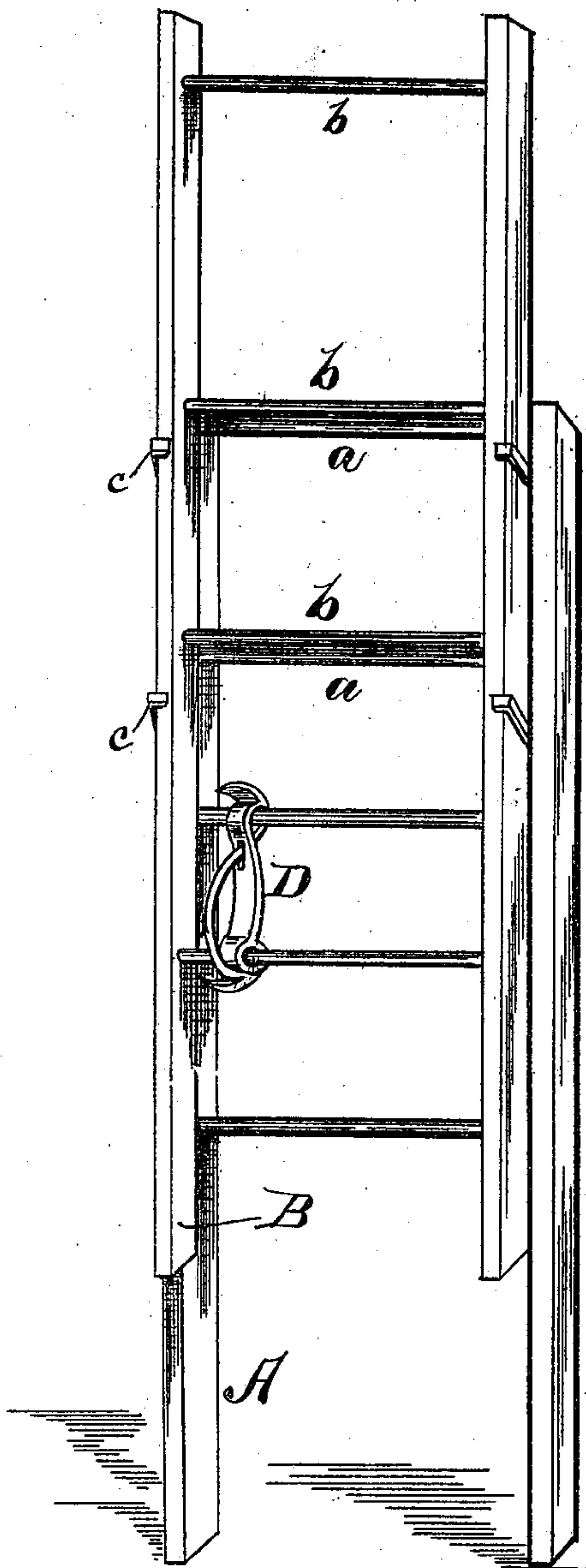


Fig. 1.

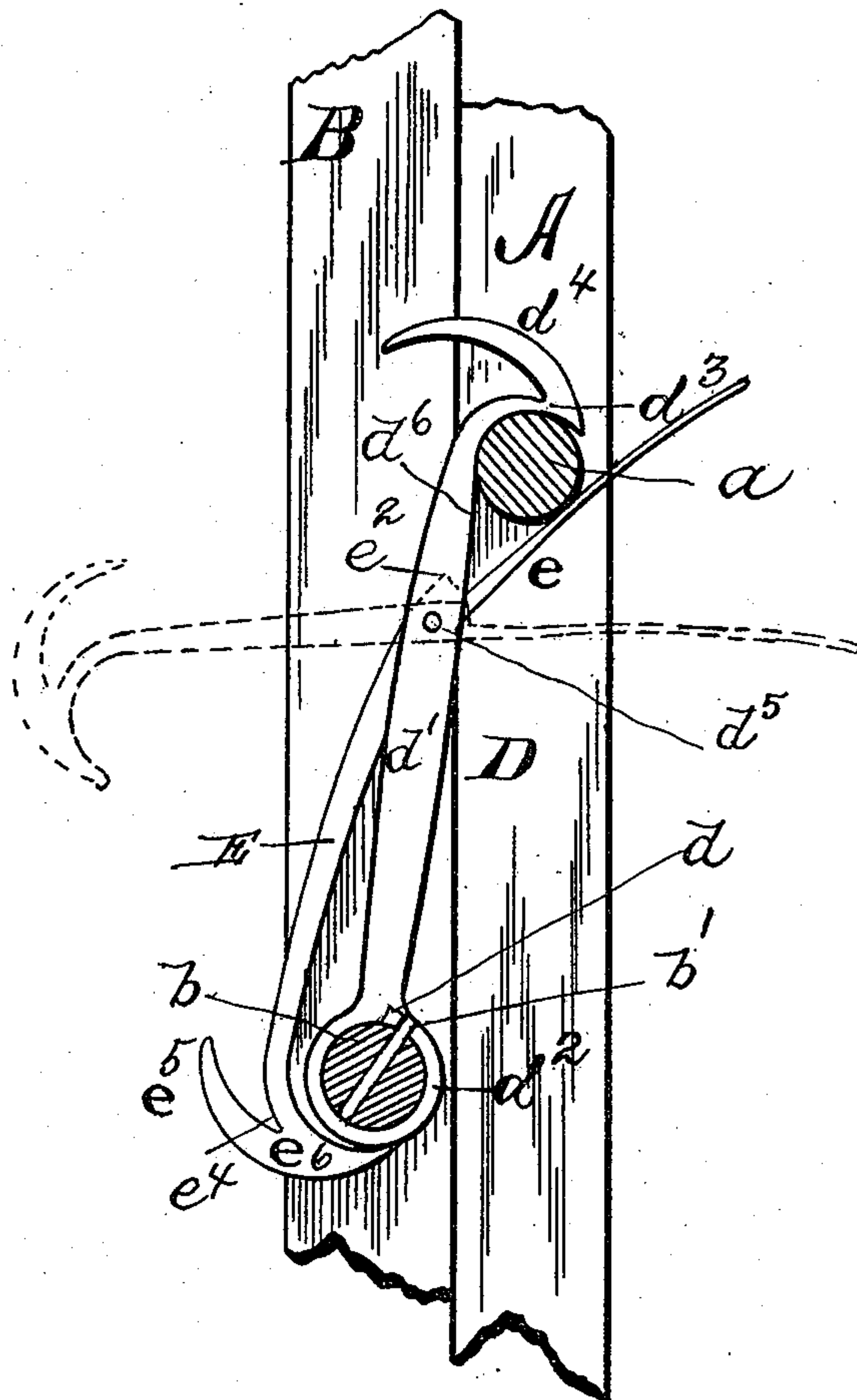


Fig. 2.

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By Smith & Morrison

ATTORNEYS.

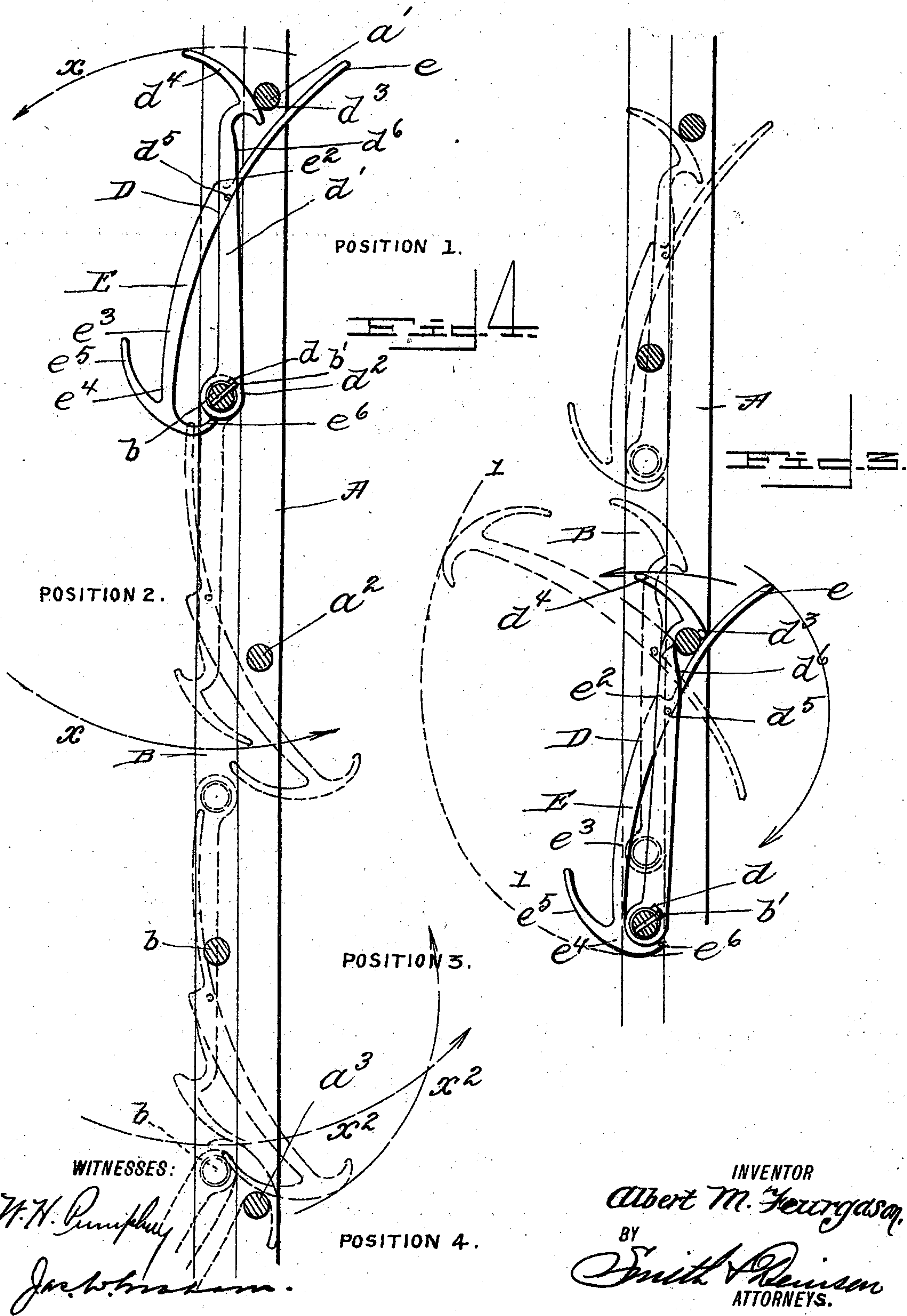
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# UNITED STATES PATENT OFFICE.

ALBERT M. FEURGASON, OF MILLPORT, NEW YORK.

## EXTENSION-LADDER.

SPECIFICATION forming part of Letters Patent No. 502,290, dated August 1, 1893.

Application filed December 5, 1892. Serial No. 454,043. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT M. FEURGASON, of Millport, in the county of Schuyler, in the State of New York, have invented new and useful Improvements in Extension-Ladders, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain new and useful improvements in extension ladders and particularly to means by which the sections may be automatically locked together or unlocked.

The object of the invention is to provide a simple, effective and inexpensive device by which two sections of an extensible ladder may be automatically locked together at any desired point of elevation, and furthermore, to employ such peculiar and novel arrangement of parts in the construction of the said device by which it may be operated automatically to disengage the sections.

Furthermore, the invention contemplates the provision of a safety locking mechanism, which is adapted to automatically lock the sections, in case of accident or failure of the main device to operate properly.

With these objects in view, the invention consists in various novel details of construction, combinations and arrangements of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail reference is had to the accompanying drawings forming part of this specification, wherein like letters indicate corresponding parts in the several views, in which—

Figure 1— is a view in perspective of one form of locking mechanism embodying my improvements and showing the same in operative position on an extensible ladder with the sliding section thereof partly extended. Fig. 2— is an enlarged view in sectional elevation of the same. Fig. 3— is a sectional view showing by dotted lines, the operation of the main lock. Fig. 4— is a similar view showing by dotted lines the operation of the safety lock.

In the drawings: A— denotes the lower or base section of the ladder, and B— the movable section which is slidingly secured thereon, by the guides C— and the latch D—.

This latch D— is pivotally mounted upon one of the rungs b— of the movable section B— and is held against swinging inwardly by a lug d— which engages a pin b'— of the rung. The body portion d'— of this latch is provided at or adjacent its lower end with a pivot ring d<sup>2</sup>— and its opposite extremity with a double hook having prongs d<sup>3</sup>— d<sup>4</sup>— one of which normally engages a rung a— of the base section A—. Mounted on a pivotal bolt d<sup>5</sup>— of this latch D— is a locking pawl E— having an outwardly extending curved arm e— which is adapted to engage the under side of the rung a— as shown, to retain the hook d<sup>3</sup>— in proper position and prevent accidental disengagement therefrom.

The operation of the device is as follows: Referring to Fig. 3— the latch is shown in its normal position by full line and in its adjusted positions by dotted lines. If now the section B— is moved upwardly the hook d<sup>3</sup>— will become disengaged from the rung a— and owing to a convexity or bulge d<sup>6</sup>— formed on the inner edge thereof it will be given a slight outward movement which is continued after this bulge passes the rung, by the engagement between the latter and a shoulder e<sup>2</sup>— of the pawl E—. During the upward movement, the pivotal center of the pawl will be elevated and by reason of the engagement between curved arm e— thereof and the under side of the rung, the weighted extremity e<sup>4</sup>— will be disengaged and elevated through the arc l—l— until the said arm passes the rung when the pawl will swing by its own weight back to its normal position with the main hook or latch substantially vertical as indicated. On a continued upward movement of this section, the prong d<sup>4</sup>— will engage the next rung a— of section A— which forces it outwardly until the curved arm e— of the pawl brings up against the under side thereof when the prong d<sup>3</sup>— will be automatically drawn inward and locked as shown in full lines. To disengage the sections after they are then locked, the movable section is elevated until the curved arm e— has passed beyond the rung and the pawl has fallen into position as shown in the upper dotted lines— Fig. 3—. Then this sec-



tion may be lowered, and as will be at once obvious, when the curved arm —*e*— engages the rungs —*a*— the main hook will be forced out of alignment therewith to prevent a locking engagement during the downward passage of the ladder section.

The operation as thus far described differs in no material respect from that of devices well known in the art, but I have found it of great importance, where ladders are quickly extended and adjusted, that a safety attachment should be employed and of such improved construction as to be readily and conveniently controlled and capable of automatic and instantaneous action when the operation of the main latch fails or becomes in any way impaired, and to this end I provide the pawl —*D*— with a downwardly curved arm —*e*<sup>3</sup>— which terminates in a hooked extremity —*e*<sup>4</sup>— having the curved prongs —*e*<sup>5</sup>—*e*<sup>6</sup>—.

Referring to Fig. 4— the device is shown in four positions to illustrate the operation of the safety attachment and assuming that the latch has failed to engage the rung —*a*'— or become fractured during the elevation of the movable section, the entire device will swing outwardly describing the arc —*x*—*x*— and the pawl being lighter than the latch, swings independently and passes between the rungs —*a*<sup>2</sup>—*a*<sup>3</sup>— of the base section. The downward travel of the movable section will carry the main latch below the rung —*a*<sup>3</sup>— before the pawl —*E*— swings outwardly again. As this hooked extremity of the pawl is drawn downwardly by the movement of the section it will engage and lock the rungs —*b*—*a*<sup>3</sup>— as shown. (Position 4.)

It sometimes happens when the latch fails to operate and swings around as above described, that both the pawl and latch pass between the rungs of the lower section (as indicated by the arcs —*x*<sup>2</sup>—*x*<sup>2</sup>—) and as the

upper section moves downwardly the body of the latch will be drawn over one of the rungs —*a*<sup>3</sup>— until the prong —*d*<sup>3</sup>— engages it, and should this prong become broken or fractured by the shock, the hooked extremity of the pawl will follow in a similar path and engage the rung to effectually prevent further downward movement of the section.

It will be understood that I do not confine myself to the exact construction herein shown and described, as various changes may be made in the detail construction without materially departing from the general idea involved.

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

1. The combination with an extension ladder composed of two or more sections, of an automatic locking device mounted on the movable section and comprising two members pivotally secured together, each of said members being provided with a terminal engaging hook having double and oppositely curved prongs, said members terminating respectively in a pivot-ring and a trip lever or pawl, as specified.

2. The combination, with an extension ladder composed of upper and lower sections, of a locking device carried by the upper section, suitable stops for limiting the movement of the locking device, and an auxiliary or safety latch pivotally secured on the locking device and provided with a trip lever and a terminal engaging hook having double and oppositely curved prongs, as specified.

In witness whereof I have hereunto set my hand this 26th day of August, 1892.

ALBERT M. FEURGASON.

In presence of—

C. W. SMITH,

HOWARD P. DENISON.