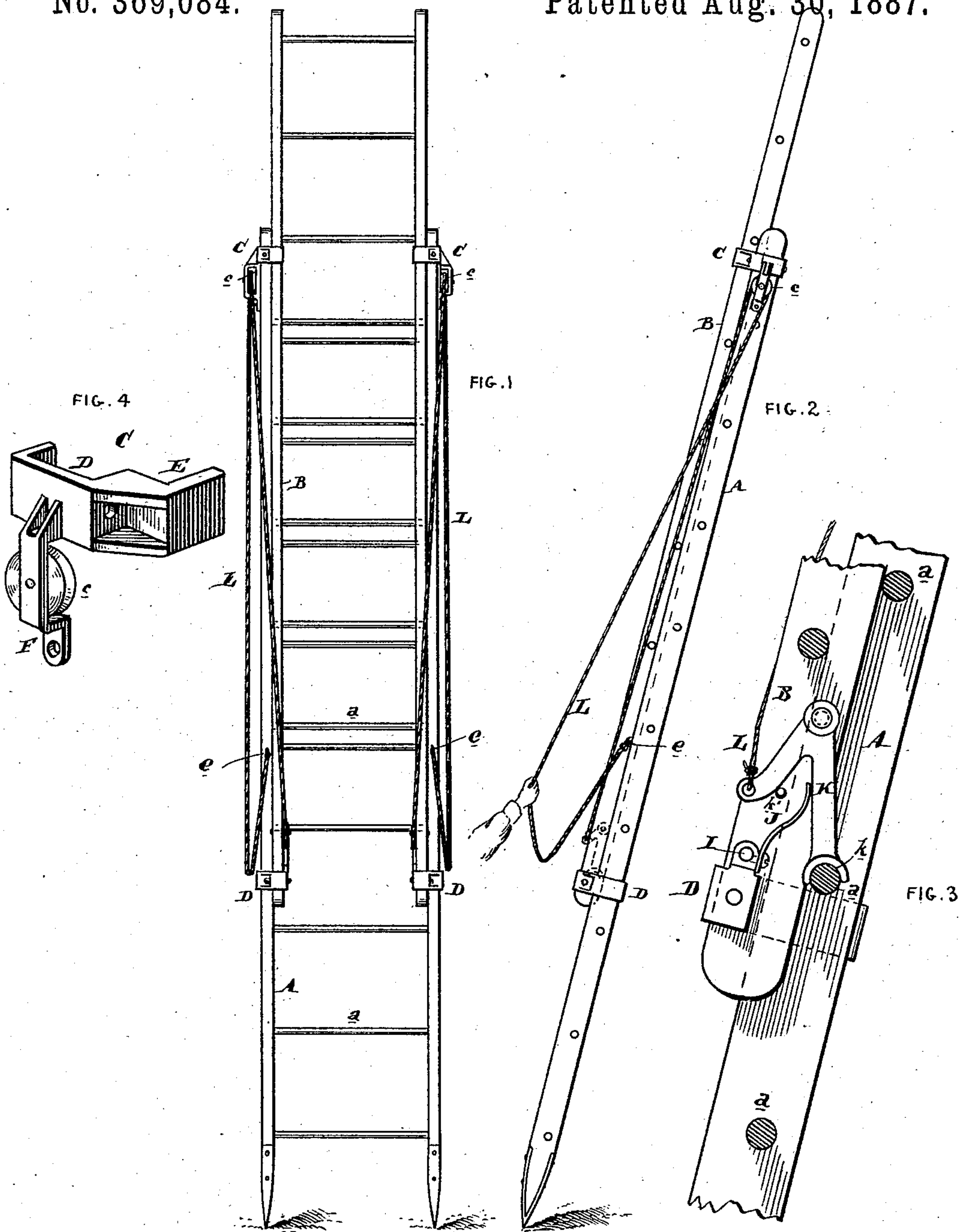


(No Model.)

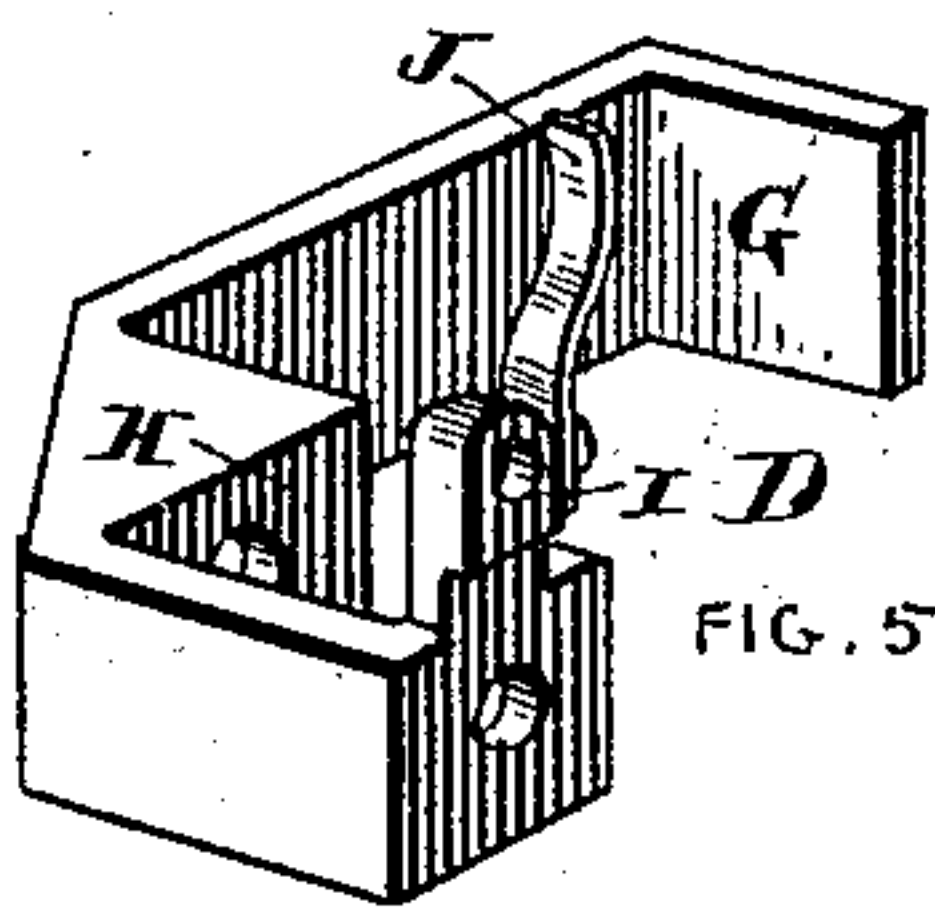
J. E. SMITH.
EXTENSION LADDER.

No. 369,084.

Patented Aug. 30, 1887.



Attest
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UNITED STATES PATENT OFFICE.

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EXTENSION-LADDER.

SPECIFICATION forming part of Letters Patent No. 369,084, dated August 30, 1887.

Application filed June 13, 1887. Serial No. 241,127. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. SMITH, of Columbus, Franklin county, State of Ohio, have invented a new and useful Improved Extension-Ladder, of which the following is a true and exact description, due reference being had to the accompanying drawings, which form a part of this specification.

The object of my invention is to provide an extension-ladder of simple construction which can be readily and safely adjusted to any desired length and as readily contracted; and it consists of two or more ladder-sections coupled and united with each other to form an extension-ladder by means of the devices hereinafter fully described, and illustrated in the drawings, in which—

Figure 1 is a front view of my improved extension-ladder, consisting of two sections, which is my preferred arrangement. Fig. 2 is a side view of my ladder; Fig. 3, a side view of the inside of my ladder, showing the devices secured at or near the lower end of the upper ladder-section; Fig. 4, a perspective view of the clamp or guide which I secure at the top of the lower ladder-section, with its attachments; and Fig. 5, a perspective view of the clamp or guide which I secure at the lower end of the upper ladder-section, with its attachments.

A is the lower and B the upper ladder-sections, which may be of any ordinary construction, and are preferably made so that the upper section shall fit in between the side pieces of the lower section and upon the rounds of the ladders.

C C are clamps or guides secured near the top of the lower section, A. They are preferably made, as shown in Fig. 4, with a recess, D, adapted to pass around the three outer sides of the side piece, to which it is secured by a bolt or any ordinary fastening, and are provided with a projecting tongue or lug, E, extending upward and then inward, so as to pass over the side piece of the upper section, B. To the side of this guide-clamp C, I prefer to secure my pulley-bracket F, in which are the bearings of the pulley c, though, as will be seen, this bracket F may be secured to the ladder-section A independently of the guide C.

D D are guide-clamps which are secured

near the bottom of the upper section, B, of my ladder. They, as is shown in Fig. 5, are provided with recesses H, which embrace the upper edges of the side pieces to which it is secured, and have a lug or tongue, G, which passes downward and inward, so as to embrace the side pieces of the lower section, A, and clamp it to the ladder. To these guide-clamps D, I prefer to secure springs J, a projection, I, being preferably formed with the clamp D for that purpose; but, as in the case of the pulley-brackets F, it is obvious that the spring may be secured to the ladder independent of the clamp.

K is a catch-lever of the bell-crank order. It is pivoted on the upper ladder-section, B, and has at the end of one arm a crotch adapted to rest over and hold to the ladder-rungs a. Its other or outer arm is the one by which it is actuated, as will be hereinafter described. The spring J is arranged so that it will constantly press against the lever K in such a way as to press the crotched arm in toward the rungs of the lower ladder-section, a stop, k, being provided so as to make the normal position of the crotch k correspond with that of the rungs a on this section. L L are ropes secured at one end to the actuating-arms of the levers K, passing thence over the pulleys c and downward, their other ends being conveniently fastened to the sides of the lower ladder-section, A, as shown.

The sections A and B of my ladder being put together and the clamps C and D secured to them in the manner shown and described, the two sections are free to slide longitudinally on each other, but are securely clamped together as against any other movement. When the ladder is erected, as is shown in Figs. 1 and 2, the clutch-lever K holds the upper section, B, in position by resting on one of the rungs a of the section A. If, now, it is desired to lengthen the ladder, the user grasps the ropes L, and by pulling on them draws the upper section, B, to any desired height, the levers K being drawn outward away from the rungs of the lower ladder by the pull, which overcomes the pressure of the springs J. When the ladder is extended sufficiently, the pull upon the ropes is relaxed, so as to let the springs J force the levers K back to their nor-

mal position, where they will grip and rest upon the rung immediately below them. A stop is of course provided to prevent the levers K from being pulled too far from their normal position, the lug I serving the purpose in the construction illustrated. When it is desired to retract the upper section, the ropes L are drawn upon sufficiently to release the levers K from the ladder-rungs, and the upper ladder-section can then easily be drawn down or allowed to fall of its own weight, sufficient pressure being maintained on the ropes to prevent the levers from engaging during its descent.

While I prefer to use the spring J to keep the lever K in its normal position, it may be dispensed with and the lever-arm so weighted as to perform the same function. I would also state that as these ladders are generally light it is not always necessary to employ a rotating pulley such as c, any smooth surface over which the ropes L will run freely being its manifest equivalent in this connection.

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

1. In an extension-ladder, the combination of the sections A and B, fitting upon each other, with the guide-clamps C D, pulley c, secured at the top of the lower ladder-section, clutch-

levers K, secured near the bottom of the upper ladder-section, and ropes L, attached to said levers and passing through the pulleys c, all substantially as and for the purpose specified.

2. In an extension-ladder, the combination of the sections A and B, fitting upon each other, with the guide-clamps C D, pulley c, secured at the top of the lower ladder-section, clutch-levers K, secured near the bottom of the upper ladder-section, springs J, arranged to press against the levers and keep them in position to engage the ladder-rungs, and ropes L, attached to said levers and passing through the pulleys c, all substantially as and for the purpose specified.

3. In an extension-ladder, the combination of the ladder-sections A B, fitting upon each other, with clamp-guides C and pulley-brackets F, secured to the upper ends of the sections A, clamp-guides D and levers K, secured to the lower end of the section B, springs J, attached to the clamps D and acting on levers K, as specified, and ropes secured to levers K and passing over pulleys c, all substantially as and for the purpose specified.

JNO. E. SMITH.

Witnesses:

EDWD. B. WALL,
W. B. WAGGONER.