No. 677,651. Patented July 2, 1901.

H. L. FRIZELL.

LADDER.

(Application filed Nov. 22, 1900.)

(No Model.)

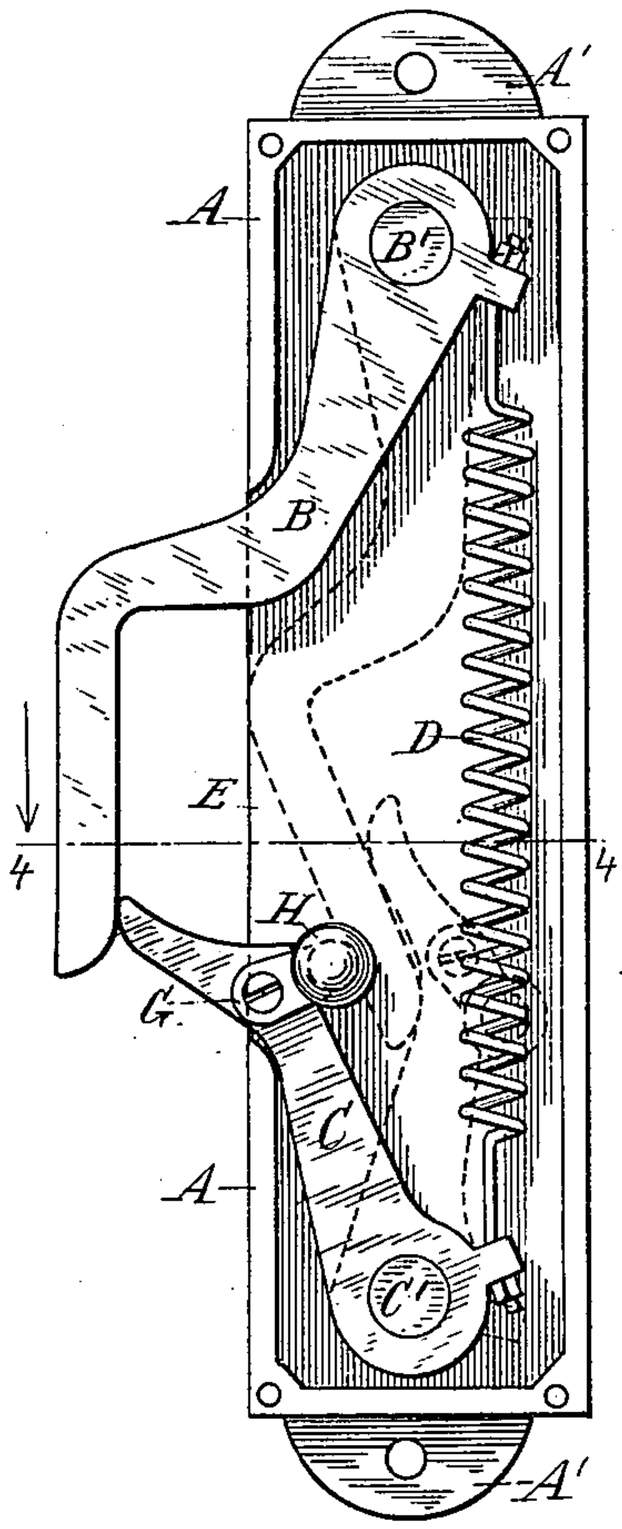

Fig. 1.

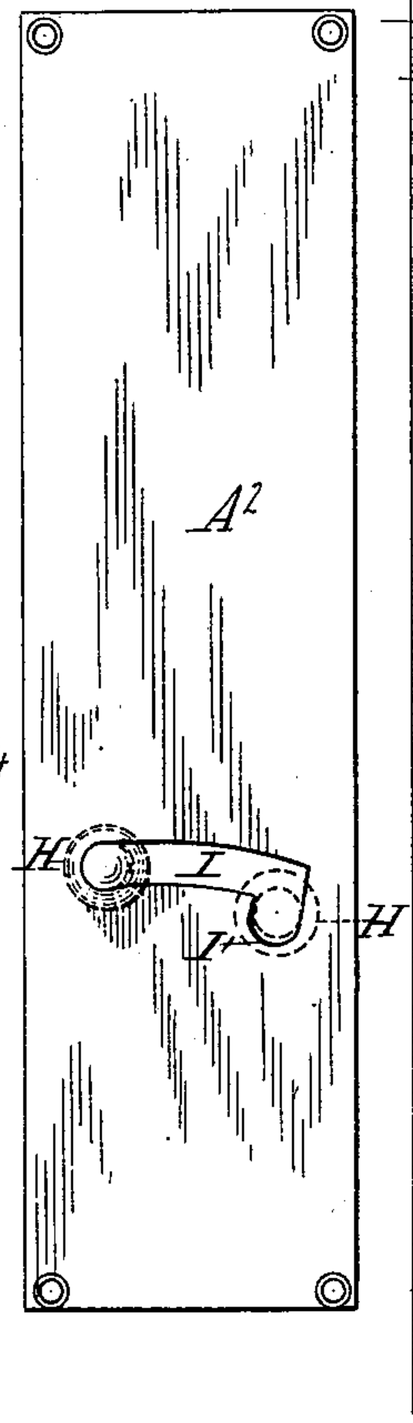

Fig. 2.

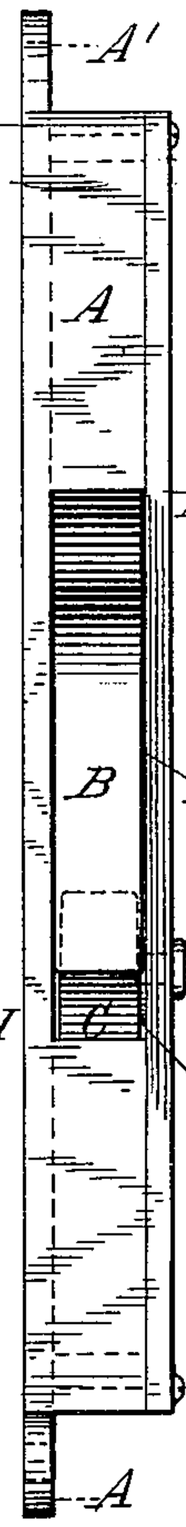

Fig. 3.

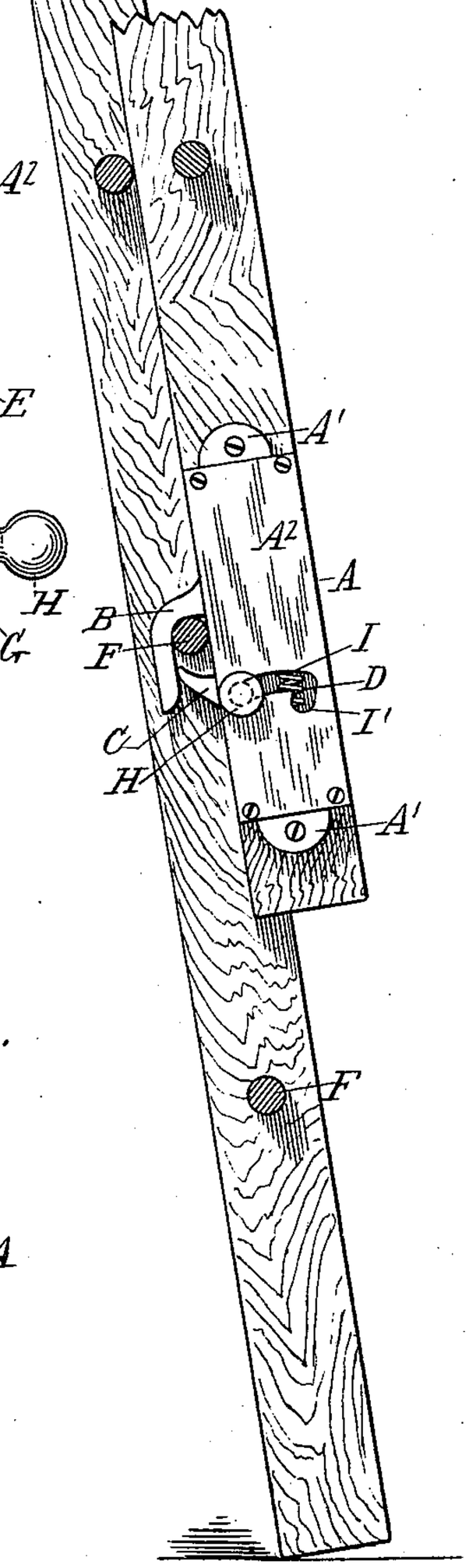

Fig. 6.

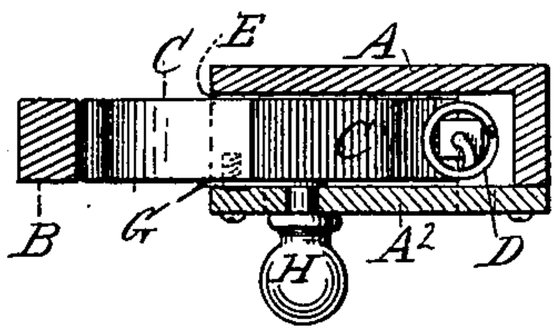

Fig. 4.

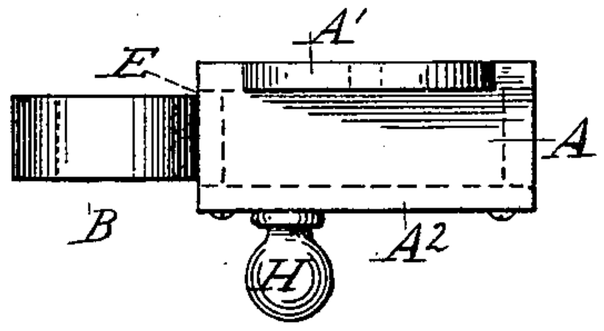

Fig. 5.

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UNITED STATES PATENT OFFICE.

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LADDER.

SPECIFICATION forming part of Letters Patent No. 677,651, dated July 2, 1901.

Application filed November 22, 1900. Serial No. 37,323. (No model.)

To all whom it may concern:

Be it known that I, HERBERT L. FRIZELL, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Ladders, of which the following is a specification.

My invention relates to the kind known as "extension-ladders," and has for its object to provide a lock which shall automatically and positively secure the extension-ladder to the rounds of the supporting-ladder at various intervals as the former is moved upon the latter to lengthen or shorten the reach of the combination, and I attain my object by means of the locking attachment illustrated in the accompanying drawings, in which—

Figure 1 is a side view of my improved ladder-lock having the face-plate removed from the casing to show the interior devices. Fig. 2 is a side view of the face-plate detached and showing the curved slot therein. Fig. 3 is an edge view of the lock. Fig. 4 is a cross-section taken as on line 4 4, Fig. 1, and as viewed from above said line. Fig. 5 is a top end view of the lock; and Fig. 6 is an illustration of the practical use of the lock, comprising portions of two of the side rails, respectively, of the supporting-ladder and the extension-ladder with my locking device shown as attached to the latter and as interlocked with one of the rounds of the supporting-ladder.

A represents the casing of the lock, provided with end projections A′, through the holes in which the lock is bolted to the inner side of one of the rails of the extension-ladder near its lower end, as shown in Fig. 6. A corresponding lock is bolted to the opposite rail in like manner. Two irregularly-outlined spring-levers B and C are pivoted at B′ and C′ within case A and are connected by a spiral spring D. The free ends of levers B and C extend outward through a side slot E in the casing and are formed to engage the rounds of the supporting or under ladder as the extension-ladder is slid upward thereon, and thus the lever B is pressed inward against the resistance of spring D and carries with it the outer end of lever C, which bears against the under side of the free end of lever B, both levers being thereby simultaneously pressed into the interior of the casing and into the positions indicated by dotted lines in Fig. 1. Thus the lock passes over the rounds as the ladder is moved upward; but immediately the round is passed the contraction of spring D forces the levers outward again. Now by retracting the extension-ladder the round of the under ladder just passed will engage the end of lever C and force that alone inward until the round has passed it, when the reaction of the spring will open outward the lever again, and thus automatically inclose the round between the two levers and the case and positively lock the ladder thereon, as illustrated at F in Fig. 6. To release the lock from the round of the under ladder, I employ a link G, pivoted to lever C and having a screw-stud H in its free end, which stud plays in the curved slot I in the face-plate A^2 and has a knob H′, which projects outward from the face-plate to facilitate the manipulation of the same. The slot I has a side extension I′, into which the stud may be swung to secure it in position when lever C is closed in thereby. The knob being pushed along the slot draws lever C into the case, so as to clear the passage for the interlocked ladder-round, thus permitting the ladder to be moved freely upward. When the lever is thus drawn into the case by the movement of the knob, it presses against and slightly deflects spring D, which is thus made to serve the additional purpose of retaining stud H in the closed position in which it is placed in the slot at I′.

It is to be understood that the top of the rails of the extension-ladder run under the usual connecting-guides attached to the supporting-ladder, while it has two opposite locks on the lower ends of its rails operating on the rounds of the under ladder, as shown and described, so as to positively and automatically interlock therewith, but readily releasable, as stated.

I claim—

1. An extension-ladder lock comprising a casing A, adapted to be secured to the extension-ladder and to slide therewith upon the supporting-ladder; two levers B, and C, pivoted within the case and connected by an actuating-spring D, the levers extending through the edge of the case, and being constructed and arranged so that lever B, overlaps lever C, while they automatically engage the

rounds of the supporting-ladder in opposite directions and securely lock the two ladders against sliding upon, or separating from, each other, substantially as specified.

2. An extension-ladder lock comprising a casing, two spring-levers pivoted within the case and outwardly extended in the manner and for the purpose stated, and an attachment to the under lever, extended through the face of the casing, whereby the lever may be alone closed and secured in the case to unlock or release the ladder, as specified.

3. An extension-ladder lock comprising a case A; a pair of spring-levers B and C, pivoted to the case and arranged to act upon and in relation to each other as specified; a spring D, connecting the two levers; a link G pivoted to lever C; there being a slot I, formed in the face-plate of the casing; and a stud H, secured in link G, through slot I, by which lever C may be alone closed and secured in the case; all substantially as and for the purposes specified.

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