

(No Model.)

J. SCHMIDLAPP.
EXTENSION LADDER.

No. 345,808.

Patented July 20, 1886.

Fig. 1.

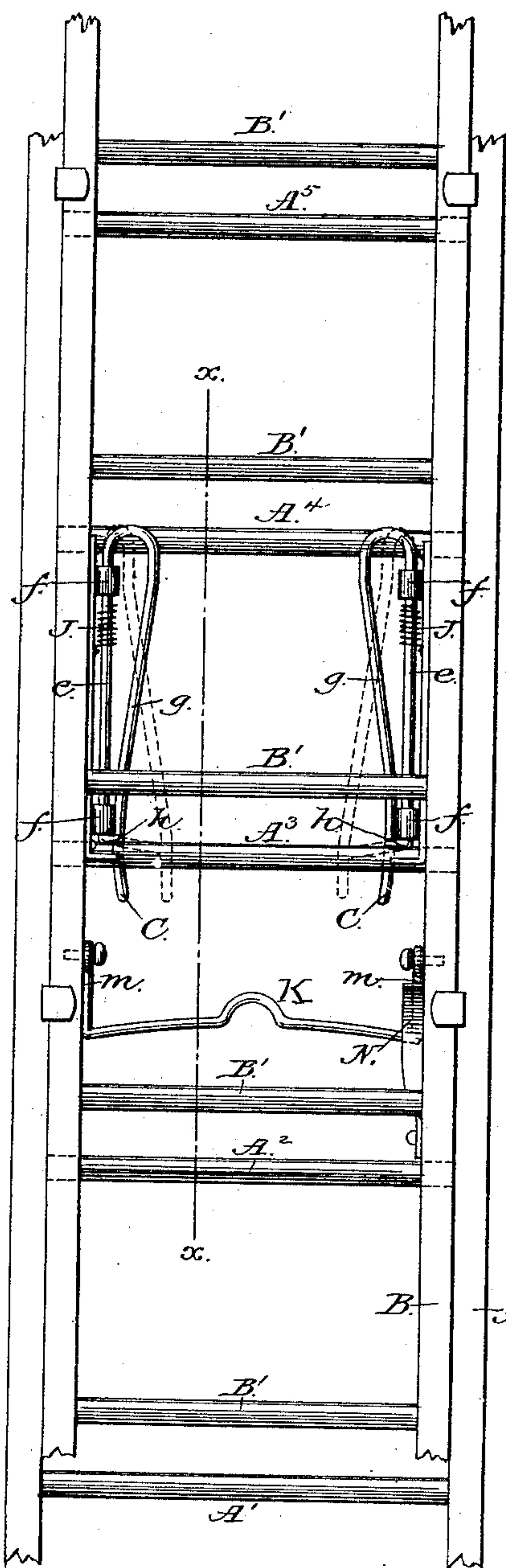


Fig. 2.

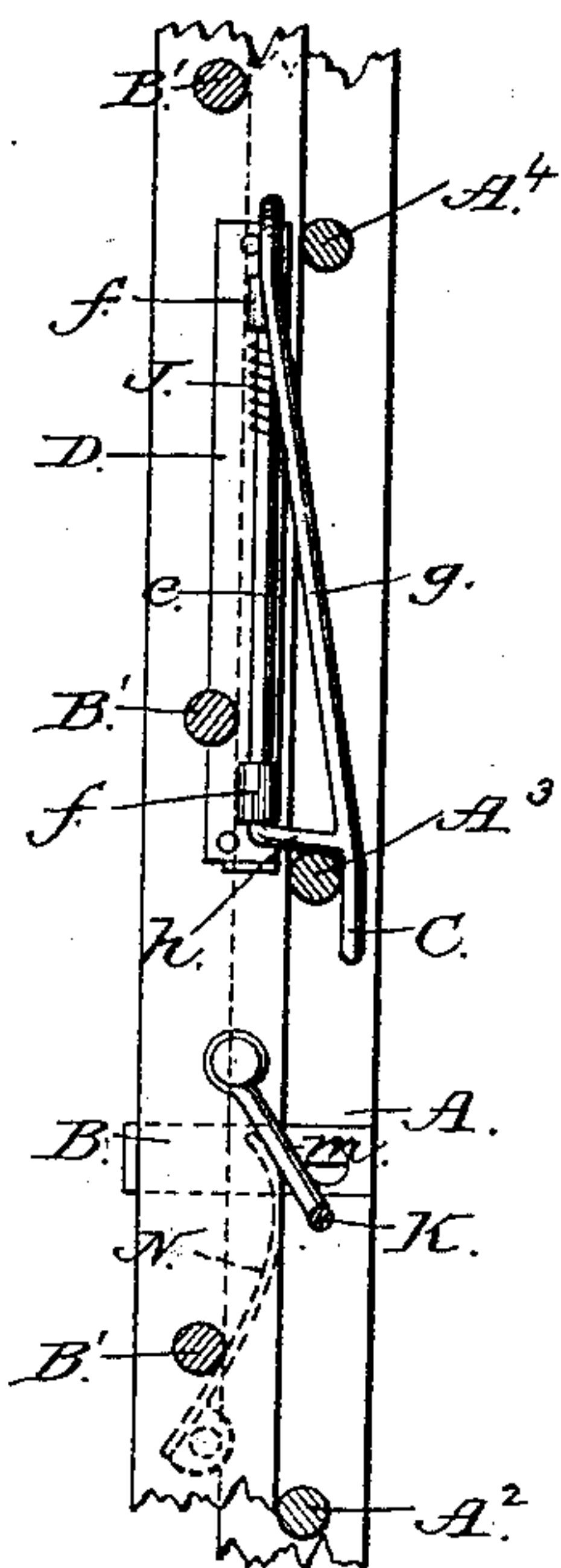


Fig. 3.

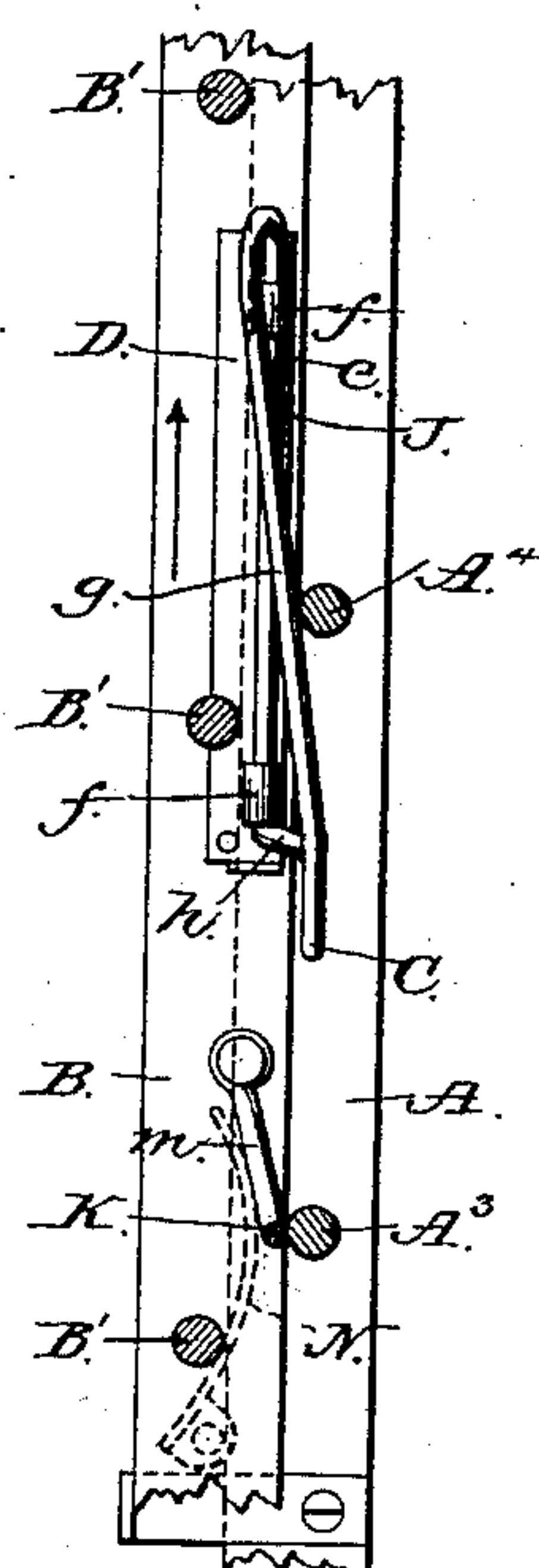


Fig. 4.

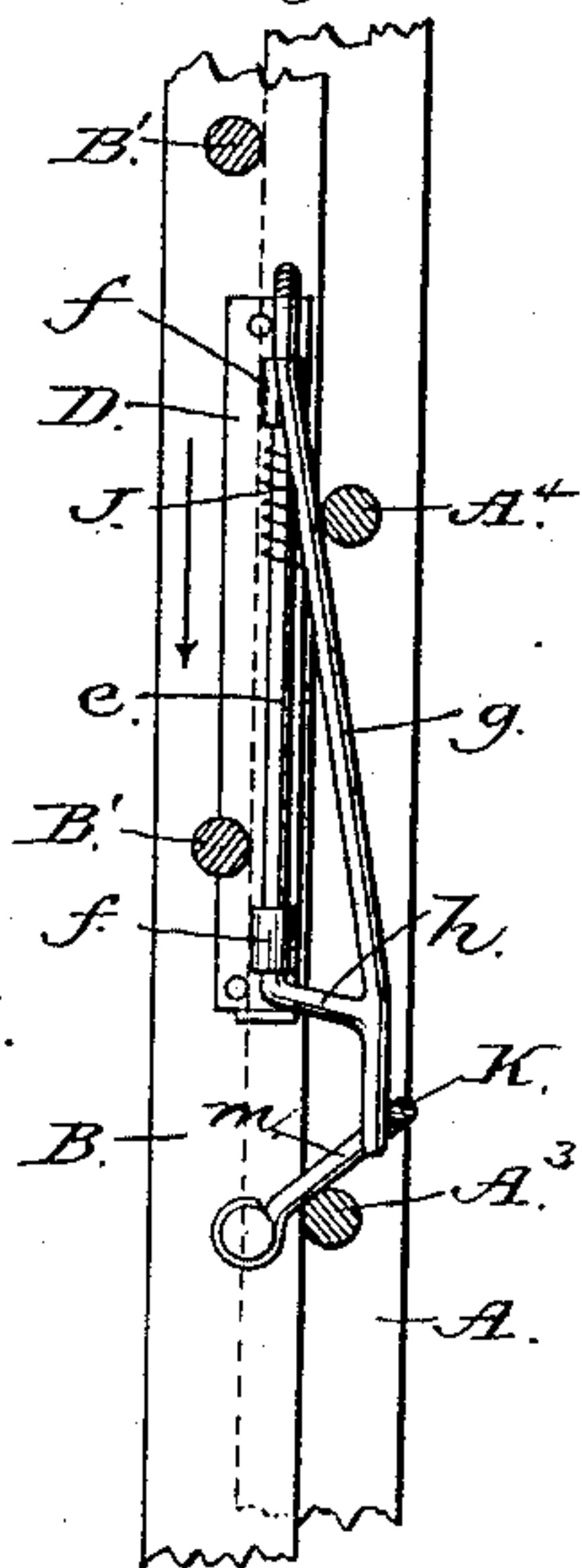
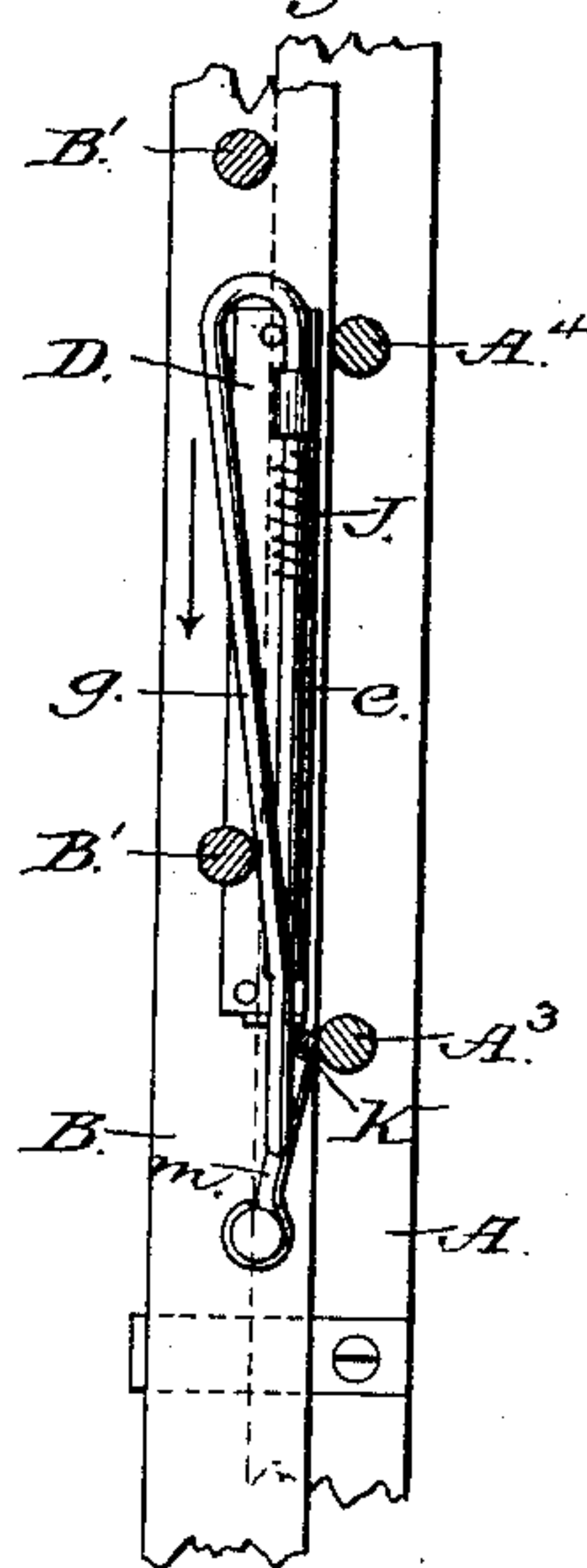


Fig. 5.



Attest:

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UNITED STATES PATENT OFFICE.

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EXTENSION-LADDER.

SPECIFICATION forming part of Letters Patent No. 345,808, dated July 20, 1886.

Application filed April 9, 1886. Serial No. 198,334. (No model.)

To all whom it may concern:

Be it known that I, JACOB SCHMIDLAPP, of the city, county, and State of New York, have invented a new and useful Improvement in
5 Extension-Ladders, consisting of an automatic catch for securing the sections thereof; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and
10 to the letters of reference marked thereon, making a part of this specification, in which—

Figure 1 is an elevation of a portion of the two sections of an extension-ladder, illustrating the application of my automatic catches
15 or retaining devices thereto; Fig. 2, a central longitudinal section in line *xx* of Fig. 1, illustrating the catch devices in the same position as shown in Fig. 1—viz., engaging the rounds of the lower fixed ladder; Figs. 3, 4, and 5,
20 similar sections, illustrating, severally, the catch devices, first, when lifted from the round previously engaged thereby; second, when lowered so as to lift the tripping-bar and cause its engagement with the catches; and, third,
25 when still further lowered, with the catches thrown inward to pass the round and in position to clear all the rounds below it.

My invention relates to devices for securing the movable section of an extension-ladder
30 to the section beneath it, and has for its object to provide an automatic catch, which, being attached to the movable section, will by a positive engagement with the last round of the lower section, to or above which the device may be carried, effectually hold and secure
35 the same as it is elevated, and which will also automatically swing free of the rounds when it is desired to lower said upper section.

40 In the accompanying drawings, A represents the lower section of an extension-ladder of any description—as, for example, a fire-ladder; and B, the upper section, adapted to slide longitudinally upon the lower section, to
45 project beyond its upper end as an extension thereof.

C C represent a pair of catches, which are constructed to uphold the upper section, B. Each catch C consists of a metallic rod having
50 a straight arm, *e*, of a length about equal to the distance between the rounds B' B' of the ladder, and which is hinged at each end to a

plate, D, (see Figs. 2 to 5,) by means of suitable eyes, *f f*, projecting from the plate, and through which the arm *e* is passed. The plates
55 D D are made fast, in any suitable manner, opposite each other, to the inner face of each side bar of the movable section B of the ladder on the under side of its rounds B' B', as shown in the drawings.

60 The hinged rod forming the inner straight arm, *e*, of each catch is bent at its upper end over upon itself, and outwardly parallel and in the same plane with the arm *e* for a short distance. (See Figs. 1 and 5.) It is then bent
65 to extend outward from the rounds of the ladder diagonally, to form an outer arm, *g*, which, when swung out toward the middle of the ladder, will consequently extend and project back and out over the rounds A', A², &c.,
70 of the lower section, A, as shown in Figs. 2 and 4. The lower end of the inner straight arm, *e*, of the catch is also bent at a right angle, to form a cross arm, *h*, which shall intersect the outer arm, *g*, at a point above the
75 end thereof. This lower cross-arm, *h*, is made fast to the outer diagonal arm, *g*, and serves as a supporting-bar for the catch, adapted to rest upon the rounds of the lower fixed ladder section, A, over which the catch may be swung.
80 A spiral spring, J, is wound about a portion of the hinged arm *e* of the catch, and is made fast thereto at one end and at the other to the plate D, so as to operate automatically to swing
85 the lower cross-arm or supporting-bar, *h*, outward transversely to the rounds A' A², &c., when it is left free, and thereby insure positively its engagement with any one of said rounds above which it may be carried. When
90 the supporting-bar *h* is in position transversely to the rounds, the upper bent end of each catch C is in a position parallel with the underlying rounds A' A² A⁴, &c., of the fixed section of the ladder, and inside of them, as shown in Figs. 1 and 2, so that an upward
95 movement of the section of ladder B, to which the catches are hinged, will operate to carry the upper end of each catch inside of the next underlying round above it, (see at A⁴, Fig. 1,) and if this upward movement be continued
100 the bearing of the diagonal arm *g* against said round A⁴ will gradually turn the cross-arm *h* inward until, as it comes opposite the round, it will be parallel therewith on its inner side,

and in this position will pass readily by it. (See Fig. 3.) So soon as the lower end of the arm *g* has, however, passed up beyond and free of the round the spiral spring *J* will operate to throw the arm *g* out again, with its cross-arm *h* in position to intersect the round, as shown in Fig. 4, so that if the ladder-section B, carrying the catch, now drops back, the cross-arm *h* will engage the round which it had just passed, and thereby support and uphold the ladder, as shown in Fig. 2. In this manner, with the spring-actuated catches alone, while a free movement of the outer section, B, of the ladder is permitted, this movable section is upheld and prevented from dropping back by the engagement of the cross-bars *h h* of the catches C C with each successive round A' A² A³, &c., of the underlying fixed ladder-section A, over and beyond which they may be carried.

To facilitate the lowering of this movable section B of the ladder when required without the necessity of turning out the catches by hand a swinging bail is provided. This bail consists of a bar, K, of a length corresponding to the distance between the said bars of the ladder, and which is bent at a right angle at each end. (See Fig. 1.) The extremities *m m* of its bent ends are pivoted to the inner face of the side bars of the outer movable section, B, of the ladder, at such a distance below the ends of the catches C C as that when the bar K is swung up upon its pivots it will strike against the lower ends of the outer bars, *g g*, of the catches, as shown in Fig. 4.

When swinging downward the bar K strikes against a spring-plate, N, (see Fig. 1, and dotted lines, Figs. 2 and 3,) attached below it to the inner face of the side bar of the ladder-section B, so that the bar K will be thereby kept so far forward that it will project over the round A² next below it on the underlying ladder-section A, while the elasticity of the spring will allow it to yield inwardly as it passes by a round in moving upward, as shown in Fig. 3. As the bar K is thus kept automatically in position to project out over and beyond the round, as at A², (see Fig. 2,) next below it of the lower fixed section, A, of the ladder, it follows that when the section B, carrying the bar, is lowered the bar will be brought into engagement with the round below it, and be thereby swung upward upon its pivots against the ends of the catches C C above it, as shown in Fig. 4, so as to operate to cause these catches to clear each round as the latter is dropped, as shown in Fig. 5. Thus in the operation of my improved automatic catch devices, whenever the ladder-section B is moved upward the catches will, by reason of the spiral springs J J, automatically swing out after passing over each round A' A² A³ A⁴, &c., of the underlying section A of the ladder, so that if the movable section B be allowed to drop back after passing any one round, A³, before the pivoted bar K has passed the same round, the cross-bars *h h* of

the catches will engage and rest upon said round, and thereby firmly support and uphold the movable section of the ladder at that point, as shown in Fig. 2; but if, after the bar K has passed any one round, A³, as it is about to do in Fig. 3, and before the free ends of the catches have passed beyond the next round, A⁴, above, the ladder is lowered, then the engagement of the bar K with the round A³, which it has last passed, will throw said bar up (see Fig. 4) against the lower free ends of the catches, and thereby prevent their engagement with said rounds. (See Fig. 5.) By this means, as the ladder is pushed steadily up, the catches will automatically engage successively each round of the underlying ladder and afford a positive support by means of its engagement, as required, with any one of them, while in reverse order, if the ladder be steadily lowered, the catches will be automatically cleared from all the underlying rounds. By arresting, however, at any time its downward movement and pressing the movable ladder-section upward again, the catches will at once engage the rounds of the underlying fixed ladder; or, by arresting the upward movement at any time, just after the swinging bar K has passed a round, the catches may be made to clear the rounds, to permit the ladder to drop.

I claim as my invention—

1. The combination, with the superimposed movable and stationary sections of an extension-ladder, of a catch-plate pivoted to the side bar of the movable section of the ladder, to swing inward between its rounds, and so bent, substantially in manner as described, as that when its upper end is parallel with the rounds its lower end shall be transverse thereto in position to project over the rounds of the underlying stationary section, substantially as and for the purpose herein set forth.

2. The combination, with the superimposed movable and stationary sections of an extension-ladder, and with a catch-plate pivoted to the side of the movable section thereof to swing inward between its rounds, and so bent, substantially in manner as described, as that when its upper end is parallel with the rounds its lower end shall be transverse thereto in position to project over the rounds of the underlying stationary section, of a transverse bail-bar, K, whose two bent ends are pivoted to the side bars of the movable section below said catch-plates in position to swing up against the lower ends of the catches, and a spring operating to throw the bar out over the rounds of the lower stationary section, substantially in the manner and for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JACOB SCHMIDLAPP.

Witnesses:

J. F. ACKER, Jr.,
JOHN A. ELLIS.