M. CRUM.

STEP LADDER.

APPLICATION FILED MAR. 16, 1908.

920,547.

Patented May 4, 1909.

2 SHEETS—SHEET 1.

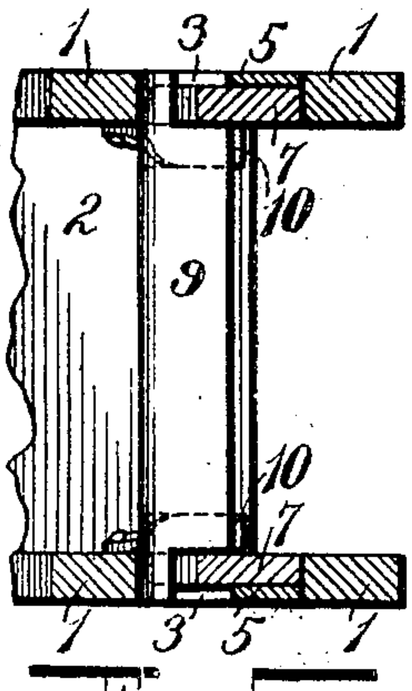


Fig. 5.

Fig. 1.

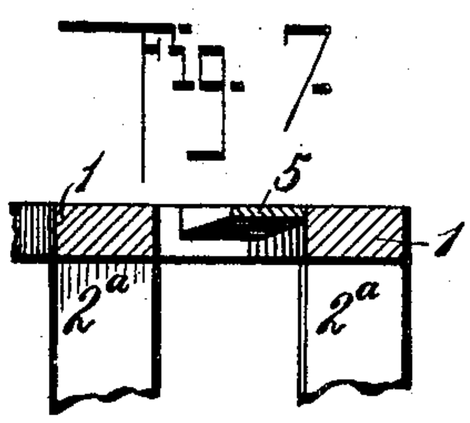
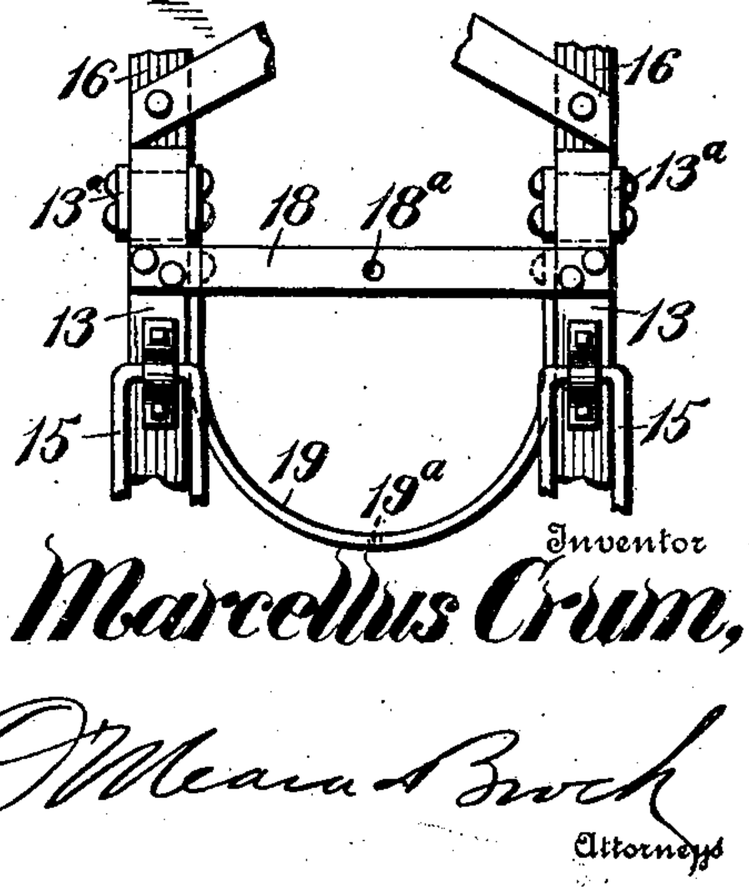


Fig. 7.

Fig. 6.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

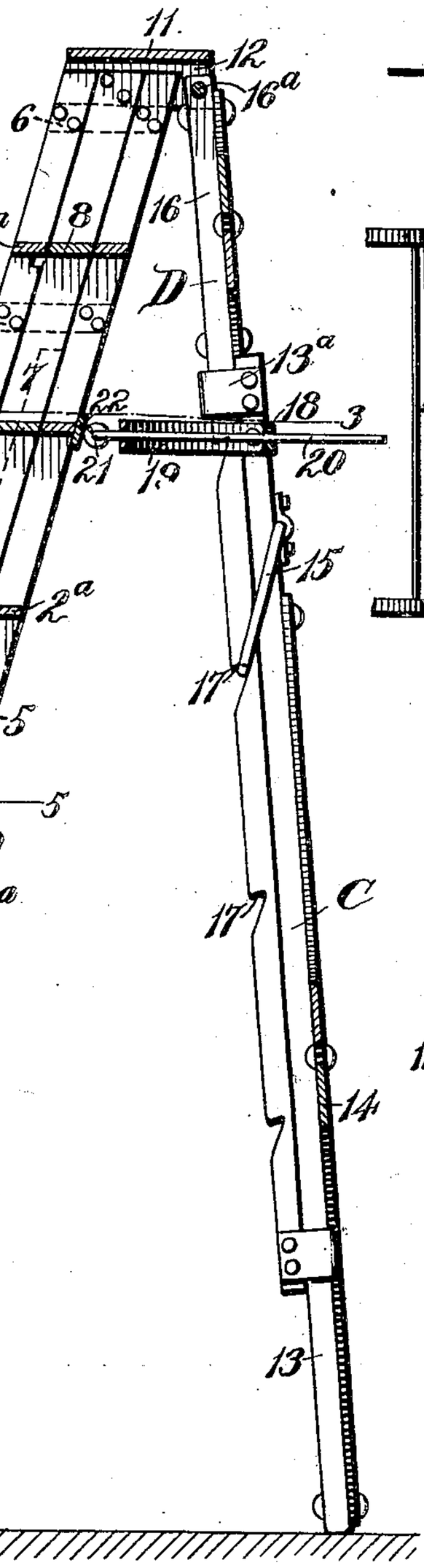

Fig. 3.

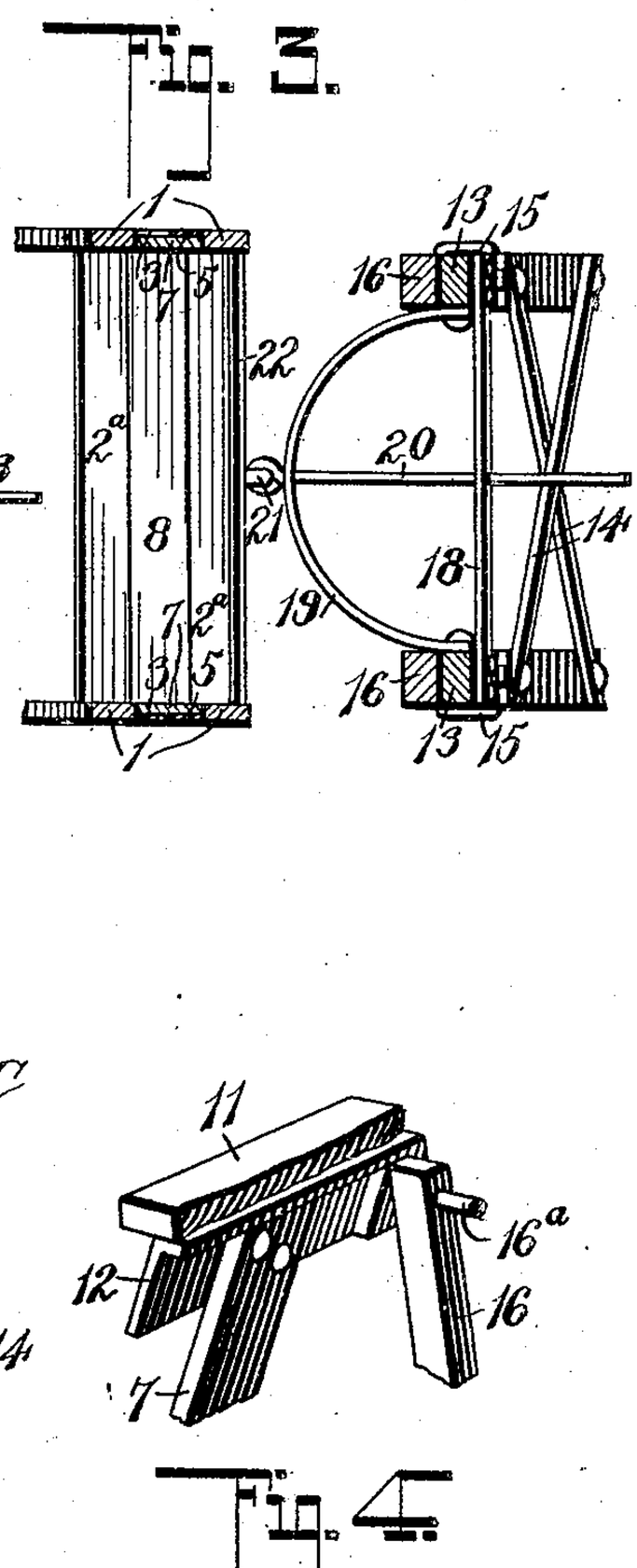

Fig. 4.

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UNITED STATES PATENT OFFICE.

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STEP-LADDER.

No. 920,547. Specification of Letters Patent. Patented May 4, 1909.

Application filed March 16, 1908. Serial No. 421,414.

To all whom it may concern:

Be it known that I, MARCELLUS CRUM, a citizen of the United States, residing at Little Rock, in the county of Pulaski, in the State of Arkansas, have invented a new and useful Improvement in Step-Ladders, of which the following is a specification.

This invention relates to an extension step ladder and the object of the invention is a ladder of this kind which will be strong and durable, and is free as possible from any vibrations when extended due to looseness or lost motion between the various sections of which it is composed.

A further object of the invention is to improve and at the same time simplify the locking mechanism by means of which the sliding sections composing the extension are locked in position relative to the stationary sections, and a still further object of the invention is to provide means for a step by step movement of the extension, so that the lower step carried by the extension will normally be held in horizontal alinement with the step portions of the lower or stationary sections.

In the accompanying drawings—Figure 1 is a perspective view of my ladder extended. Fig. 2 is a sectional side elevation showing the extension in closed position. Fig. 3 is a section on the line 3—3 of Fig. 2. Fig. 4 is a detail perspective view partly broken away and partly in section showing details of construction of the top of the ladder. Fig. 5 is a section on the line 5—5 of Fig. 2. Fig. 6 is a detail rear elevation of a portion of the supporting sections. Fig. 7 is a detail section on the line 7—7 of Fig. 1.

In constructing this ladder I employ four sections, a front lower step section A which I will term the stationary section, an extension step section B, and lower and upper supporting leg sections C and D, respectively, the section D sliding upon the section C and being pivotally connected to the section B which in turn slides upon section A. Taking these various sections in detail the lower stationary front section A consists of parallel side members 1 provided with steps 2 shown in a ten-foot ladder as three in number, the steps being about one foot apart. Above the steps 2 the sides 1 are longitudinally slotted as shown at 3 and the forward edges of these slots are notched at regular intervals as shown at 4. Between the slotted portions of the side members 1 extend steps 2^a being formed of two separate pieces one in advance of the slot 3 and one to the rear of said slot, and each of these steps is arranged immediately above one of the notches 4. Along the rear edges of the slots 3 are arranged longitudinally extending wedge-shaped plates 5, the said plates tapering toward their upper ends and these plates serve as guides for the extension section B. Above these plates bars 6 are transversely carried by the side members 1 said bars extending across the slots 3.

The section B comprises parallel side members 7 adapted to slide in the slots 3 of the members 1, said slots being open at their upper ends, and the side members 7 are connected by steps 8 which slide between the two-piece steps 2^a. When the section B is in closed position the steps 8 will fill the spaces between the front and rear pieces forming the steps 2^a thus presenting a continuous step from front to rear corresponding to the steps 2. Beneath the lower step 8 is slidably held a locking bar 9 adapted to fit in the notches 4, and each of the side members 7 carry at their lower ends and upon their inner faces a spring 10 the body portion of which is bent over a pin 10^a, and the free ends of these springs bear upon the rear edge of the locking bar 9 and normally holds the same in the notches 4. A flat top 11 is carried by the section B and this top is provided with angled depending flanges 12 which when the section B is in closed position fit over the upper ends and sides of the members 1, of the section A.

The lower supporting section C comprises two parallel legs 13 connected together by suitable braces 14 and carrying pivotally mounted links 15 intermediate the ends of the legs 13, and at the upper ends of said supporting section C are placed brackets 13^a.

The extension section D consists of supporting legs 16 which work through the brackets 13^a and slide upon the supporting legs 13, and the legs 16 are notched as shown at 17, said notches being engaged by the links 15.

A bar 18 perforated at 18^a is carried by the supporting legs 13 and there is also pivotally connected to said legs a bail 19 perforated at 19^a and a rod 20 secured to an eye 21 carried by a cross bar 22 of the section A is adapted to extend through the perforation 19^a of the bail 19 and through the perforation 18^a of the bar 18 thus serving as a brace capable of extension by reason of the length

of the rod 20, between the front and the rear sections.

When the section B is in closed position the side members 7 stand substantially to the lower end of the slot 3 sliding between the wedge-shaped plates 5 and by reason of the binding action of said plates upon said side members the ladder can be carried from place to place without any inconvenient slipping of the sections, one upon the other, and such binding action also avoids any rattling between the sections A and B during the moving or using of the ladder. It will also be noted that when the section B is extended the locking bar 9 is first pressed rearwardly to disengage it from the lower notches 4, and by reason of the pressure of the springs 10 said locking bar will engage the next set of notches 4, and the section B will, therefore, have a step by step movement, and as it will be automatically locked each time the step 8 enters the space between the front and rear pieces of the steps 2^a, the pieces forming the said steps and the steps 8 will always be brought into proper alinement, said alining being performed automatically by operation of the said locking bar.

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

1. An extension ladder comprising a stationary section, said section having side members, steps carried by said members, said steps being formed of front and rear pieces spaced apart, and sliding sections having steps filling the spaces between the pieces forming steps of the first mentioned section.

2. An extension ladder comprising a stationary step section having slotted side members, wedge-shape plates carried by the side members, and a sliding section having side members working in said slots and between the wedge-shape plates.

3. An extension ladder comprising a stationary section having longitudinally slotted side members, step sections arranged on the front and rear sides of said slots, the front edges of the slots being notched below and adjacent said steps, wedge-shape plates carried by the rear sides of said slots, an extension having side members sliding in said slots and between the wedge-shape plates, a movable bar carried by said extension, a spring carried by the extension and forcing the bar successively into the notches as the extension is lifted, and steps carried by the extension and fitting between the sections of the first mentioned steps.

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