R. B. SHAW.

EXTENSION LADDER.

APPLICATION FILED DEC. 15, 1909.

992,915. Patented May 23, 1911.

2 SHEETS—SHEET 1.

Fig 1

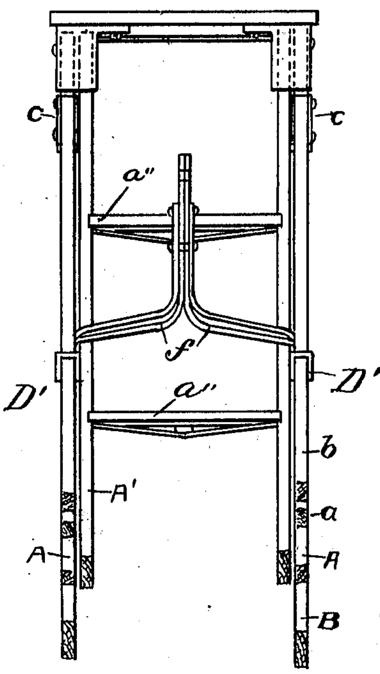
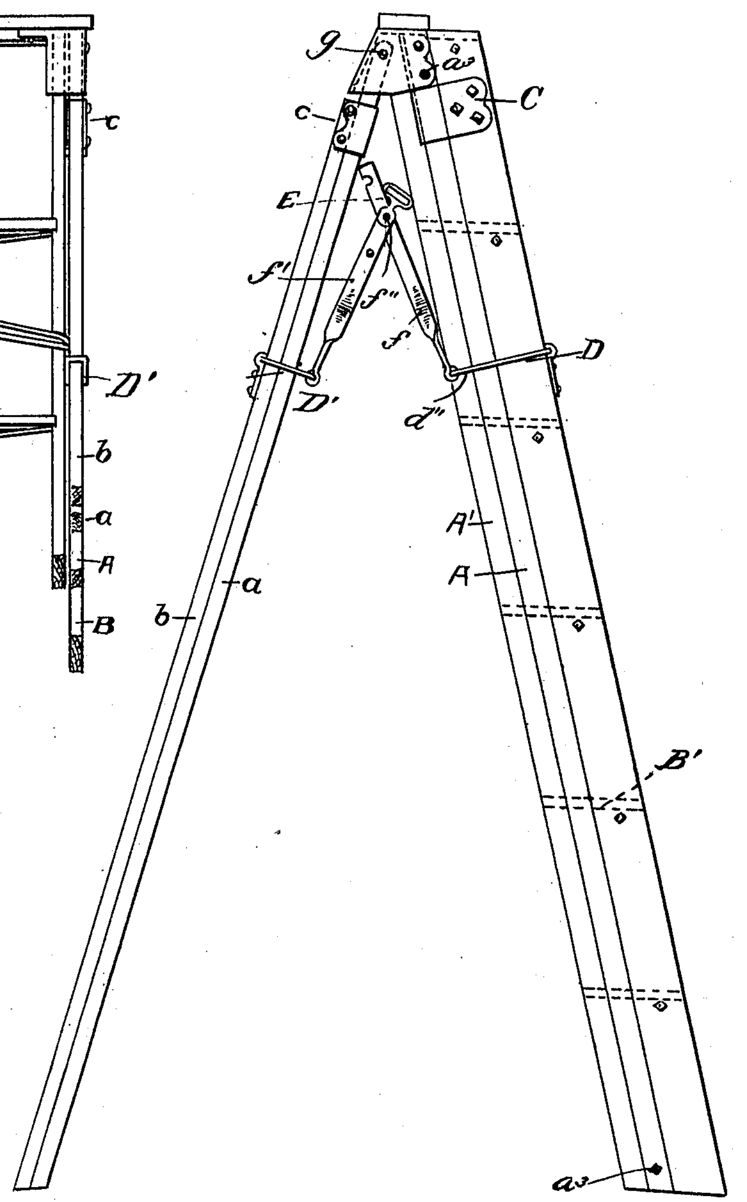


Fig 2



Witnesses
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2 SHEETS—SHEET 2.

Fig 3

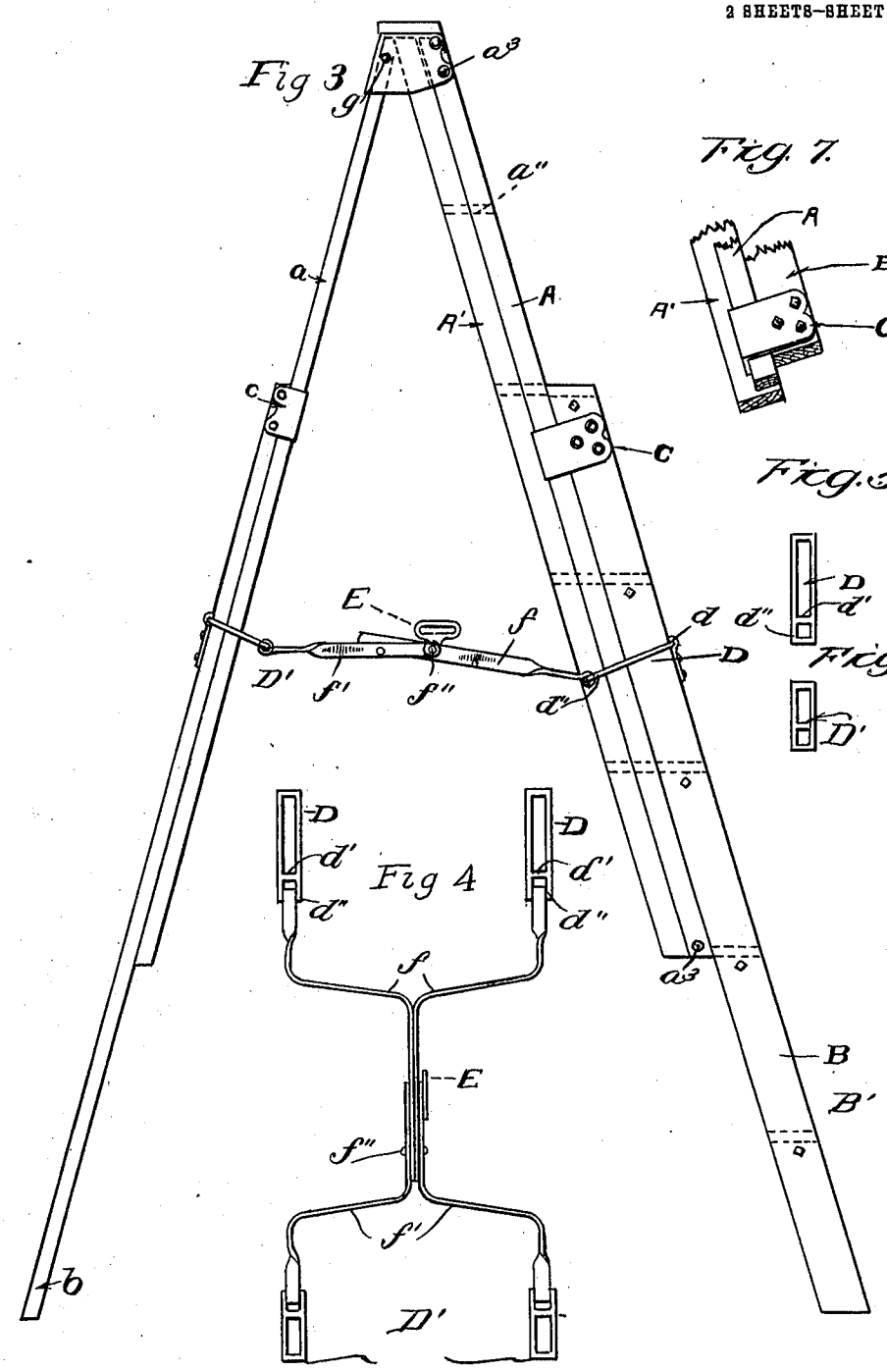

Fig. 7.

Fig. 5.

Fig. 6.

Fig 4

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UNITED STATES PATENT OFFICE.

RYLAND B. SHAW, OF DECATUR, ILLINOIS.

EXTENSION-LADDER.

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To all whom it may concern:

Be it known that I, RYLAND B. SHAW, a citizen of the United States, residing at Decatur, county of Macon, State of Illinois, have invented certain new and useful Improvements in Extension-Ladders, of which the following is a specification.

This invention relates to certain improvements in extension ladders; and the objects and nature of the invention will be readily understood by those skilled in the art in the light of the following explanation of the accompanying drawings showing what I now consider my preferred embodiment from among other formations and arrangements within the spirit and scope of my invention.

The invention consists in certain novel features in construction and in combinations and arrangements as more fully and particularly set forth and pointed out hereinafter.

Referring to the accompanying drawings; Figure 1, is a rear elevation of a portion of a step ladder embodying my invention. Fig. 2, is a side elevation of said step ladder showing the extensions thereof lowered. Fig. 3, is a side elevation of the step ladder spread in operative position and showing the extensions thereof elevated. Fig. 4, is a detail top plan view of locking links of the ladder and legs and the brace connecting the same. Figs. 5 and 6, are detail views of the locking links of the legs and ladder, respectively. Fig. 7, is a detail sectional perspective view of a portion of the ladder.

The ladder proper is composed of a front, lower or main section, and a rear or extension section.

The main section consists of the longitudinal side bars B, rigidly secured together and supporting the treads B′.

The extension section consists of a pair of parallel longitudinal side bars A′, supporting the treads a'', and spaced a distance apart less than the distance between the two bars B of the main section; and a pair of longitudinal guide bars A, parallel with, and outside of and spaced a distance from the tread supporting bars A′, and rigidly fixed thereto by cross bolts a^3 or other suitable means. The front longitudinal edges of guide bars A rest against and are parallel with the rear longitudinal edges of the side bars B, of the main section.

At their upper ends, the main section side bars B have guide loops C, rigidly secured thereto and loosely encircling the guide bars A, and holding them in longitudinally sliding engagement with said bars B. Each guide loop can consist of a U-shaped metal plate fitting and secured to the opposite side faces of a bar B with the closed or doubled end thereof extending rearwardly from the bar B, and loosely passing around the bar A, to hold the same to the bar B. The bars A, are straight and smooth-faced to permit the free longitudinal movement thereof through the guide loops or plates C.

At a point a distance below its upper end, or at a point intermediate its length, the main section is provided with a locking device passing to the rear edge of the extension section to permit free upward movement of said section on the main section but to grip and wedge said extension section to the main section and against downward movement thereon for the purpose of locking said extension, at any point in its range of movement, against downward movement on the main section.

In the specific example illustrated, this locking device comprises a strong metal link D, extending from front to rear of the main and extension sections and at its front end arranged transversely of the front edge of a main section side bar and pivotally confined thereto by a suitable clip d, whereby the link can swing vertically on its front transverse end as an axis. The link is provided with a transverse gripping bar or portion d', arranged in rear of a longitudinal rear edge of a bar of the extension section. This transverse gripping portion d', is arranged a distance from the front axis on which the link swings, greater than the horizontal distance from longitudinal rear edge of an extension section bar to said axis, whereby the extension section can be freely drawn upwardly on the main section inasmuch as the link will be thereby swung up to the horizontal position. However, when the extension section is moved down on the main section the free end of the link will swing down and thereby drive its gripping portion d', into said rear longitudinal edge and press the extension section forwardly tightly against the main section and thus so tightly lock and wedge the parts together as to uphold the extension section in the desired position.

In the example shown, each gripping or locking link D, comprises elongated side

bars and a front cross bar forming the link pivot and a rear cross bar forming the gripping portion d', and this link encircles a main section side bar B, and an extension guide bar A, and the gripping bar d', extends across the rear edge of the bar A. A pair of these links is provided, one for each pair of side and guide bars B, A. Suitable means are provided for connecting these two links to cause them to swing together to act as one link or locking device. For instance, I show the two ladder locking links connected by a cross member f, pivotally joined to the ends d'', of the links extended rearwardly beyond the gripping bars d', thereof, and by which the two locking links can be swung up to break their gripping hold on the extension section when it is desired to raise or lower the same.

When the ladder is to be used as a step ladder, I provide an extension leg consisting of a main or base section composed of rigidly connected longitudinal bars b, and an extension section at its upper end pivotally joined by cross bolt g, to the upper end of the ladder extension member, and consisting of a pair of longitudinal bars a, arranged parallel with and resting longitudinally against the inner or front edges of the bars b. At their upper ends, the bars b, have guide plates or loops c, fixed thereto and loosely encircling bars a, to confine the bars together in longitudinal sliding engagement.

Intermediate their lengths, the bars b, are provided with vertically swingable locking links D', similar in construction and operation to the links D, and loosely embracing the pairs of bars a, b, respectively and pivotally joined to the bars b, so that their front free gripping ends traversing the front edges of bars a, can swing vertically to and from gripping position. These links lock and release the bars a, the same as described in connection with links D.

The two gripping links D', are connected to work in unison by cross member f', and the two cross members f, f', can be pivotally joined at f'', to form the step ladder brace, and at the pivotal point can be provided with a handle E, for "breaking" the brace or folding the same upwardly as will be readily understood by those skilled in the art.

What I claim is:—

1. In an extension ladder, in combination, a main section of side bars and treads, an extension section arranged parallel therewith and adjustable longitudinally thereof and confined thereto and comprising side bars provided with treads and outer-side longitudinal guide bars parallel with and spaced from the side bars and arranged in sliding longitudinal engagement with the rear edges of said main section side bars, and a swingable wedging and locking device pivotally joined to the main section bars and having transverse gripping portions traversing the rear edges of said guide bars.

2. In an extension ladder, in combination, a main section of side bars and treads, an extension section arranged parallel therewith and adjustable longitudinally thereof and confined thereto and comprising side bars provided with treads and outer-side longitudinal guide bars parallel with and spaced from the side bars and arranged in sliding longitudinal engagement with the rear edges of said main section side bars, and a swingable wedging and locking device pivotally joined to the main section bars and having transverse gripping portions traversing the rear edges of said guide bars, and comprising several links embracing the pairs of main section bars and guide bars, respectively, and means connecting the rear free ends of said links to raise the same in unison.

3. In an extension ladder, in combination, a main section of side bars and treads, an extension section of side bars and treads and provided with outer-side guide bars spaced from said side bars, guides fixed to the upper end portions of said main section bars and loosely embracing said guide bars, and several locking links embracing the pairs of main section bars and guide bars, respectively, and at their front ends traversing and pivotally joined to the front edges of said main section bars and at their rear ends having gripping portions traversing the rear edges of said guide bars, and means connecting the rear ends of said links to cause them to swing vertically together.

4. An extension ladder comprising a main ladder section, an extension ladder section confined to said main section in longitudinal sliding adjustment, a leg at its upper end pivotally joined to the upper end of said ladder extension section and comprising sections confined together in longitudinal sliding adjustment, vertically swingable gripping links for locking said ladder sections together and for locking said leg sections together, and a jointed vertically-folding brace between said ladder and leg and confined to and connecting said links, substantially as described.

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Witnesses:
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