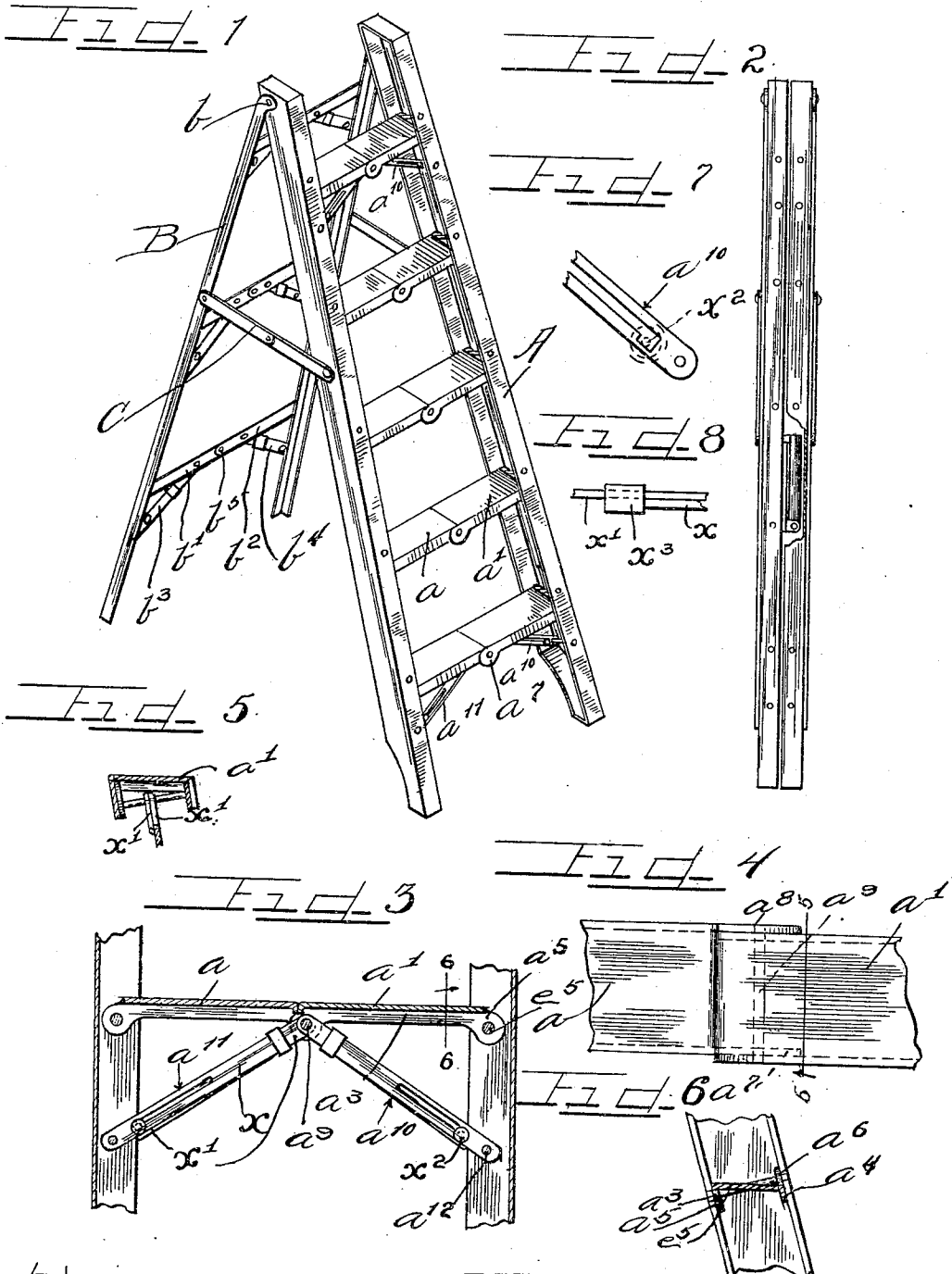


J. J. DENNIS.
LADDER.

APPLICATION FILED MAR. 6, 1908.

958,732.

Patented May 24, 1910



WITNESSES
J. H. Angell
J. E. Farnham
INVENTOR
John J. Dennis
By Charles W. Allen
Att'y.

UNITED STATES PATENT OFFICE.

JOHN J. DENNIS, OF CHICAGO, ILLINOIS, ASSIGNOR TO DENNIS NOVELTY LADDER COMPANY, A CORPORATION OF ILLINOIS.

LADDER.

958,732.

Specification of Letters Patent.

Patented May 24, 1910.

Application filed March 6, 1908. Serial No. 419,470.

To all whom it may concern:

Be it known that I, JOHN J. DENNIS, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Ladders; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in ladders.

Step ladders as heretofore constructed have been cumbersome to handle and occupy considerable space when not in use which also causes inconvenience when moving the ladder.

It is an object of this invention to provide a collapsible ladder capable of being folded together to occupy small compass when not in use.

It is also an object of this invention to provide a device of the class specified constructed of pressed metal and which is strong, durable, easily and quickly operated and so cheap to manufacture as to be within the reach of all users.

The invention consists in the matters hereinafter described and more fully pointed out and defined in the appended claims.

On the drawings: Figure 1 is a perspective view of a step ladder embodying my invention. Fig. 2 is a view of the ladder closed. Fig. 3 is an enlarged fragmentary longitudinal section taken centrally through the stiles and step. Fig. 4 is an enlarged fragmentary top plan view of one of the steps. Fig. 5 is a section on line 5—5 of Fig. 4. Fig. 6 is a section on line 6—6 of Fig. 3. Fig. 7 is an enlarged detail of one of the braces. Fig. 8 is a top plan view thereof.

As shown in said drawings: A indicates the stiles of the ladder which may be constructed in any preferred manner and material but as shown comprise inwardly facing pressed steel channel of light gage having closed ends and which at their lower or supporting ends are reduced in width. The steps likewise pressed channels may be of any preferred number, and distance apart and each consists of two sections a — a' pro-

vided with downturned flanges a^3 — a^4 at the edges thereof directed at an angle therewith dependent upon the angle of inclination of the stiles with the vertical when in open position. Lugs a^5 — a^6 integral with the flanges at the outer ends of the sections are provided which closely fit within the side flanges of the stile and a pin e^5 extends transversely the stile and is rigidly secured to the side flanges thereof affording a pivot for the outer end of each step section. The inner ends of the sections are provided with integral rounded lugs a^7 — a^8 one fitting within and one without the respective lugs of the other section and a pintle a^9 extends through said lugs hinging the sections together.

Braces a^{10} — a^{11} each consisting of two slidably connected members x — x' are pivoted at their inner ends to the pintle a^9 of the top and bottom steps and at their lower ends on pins a^{12} secured to the flanges of the stiles. One of said brace members is provided at its inner end with a clasp x^3 which slidably engages the other and is longitudinally slotted to receive a pin x^2 which extends there-through and seats in a notch.

Props or rear stiles B comprising light angle bars are hinged at their upper ends to the upper ends of the stiles A, and as shown the flanges of said angle bars are turned inwardly at the top to form a lip b through which the connecting pintle extends and the ends of the webs are cut away to permit the ends to swing outwardly as shown in Fig. 1.

Connecting straps b' — b^2 are pivoted at their outer ends to the respective props or legs B and are hinged together at their inner ends. Braces b^3 — b^4 constructed as are the braces a^{10} — a^{11} are pivoted at their inner ends on pins b^5 engaged on the straps b' — b^2 and at their outer ends afford a pivotal connection with the stiles as do the outer ends of the braces a^{10} — a^{11} .

Braces C of any suitable length one on each side the ladder are hinged at one end to the prop B and at the other end pivotally engage the stiles A and are hinged in the middle to open upwardly and act when extended to firmly secure the ladder in adjusted position ready for use.

The operation is as follows: When desired to fold or close the ladder from the position shown in Fig. 1, the braces C are lifted at

the middle, closing the props against the stiles A. The ladder is then inverted and tapped lightly on the floor. The braces b^2-b^4 $a^{10}-a^{11}$ and the steps thereupon

5 swing downwardly bringing the stiles together in very compact form as shown in Fig. 2 with the step and all the braces except the braces C inclosed between the same.

As shown the device is embodied in a step ladder but it is obvious that the rear stiles or props may be omitted.

The braces C may of course be adjustable as to length if preferred as described with reference to other braces.

15 Changes may be made and details may be varied without departing from the principle of my invention and I therefore do not purpose limiting this application for patent otherwise than necessitated by the prior art.

20 I claim as my invention:

1. A foldable ladder comprising stiles, steps pivoted to the stiles, each step hinged centrally adapted to fold together, brace bars pivotally connected at their outer ends 25 to the stiles and pivotally connected at their inner ends to the steps, each brace bar constructed of a plurality of parts and means connecting the parts to permit the parts sliding longitudinally.

30 2. In a device of the class described the combination with stiles of steps pivoted thereto and hinged centrally to permit the stiles to be folded together longitudinally and braces, each comprising a plurality of 35 sections connected to slide relatively of each other and bracing one or more steps in open position.

40 3. In a step ladder stiles constructed of channel bars, props hinged thereto constructed of angle bars each adapted to fold against the stiles at one of the angles, horizontal bars connecting the props, each hinged centrally to permit the props folding toward 45 each other, foldable steps pivoted at their ends to the stiles adapted to fold in the channel bars, brace bars connecting the stiles and the steps centrally, brace bars connecting the props and the horizontal bars, each brace bar constructed of a plurality of bars and 50 means connecting the bars forming each

brace bar adapting each brace bar to extend longitudinally.

4. In a foldable ladder the combination with stiles, of steps hinged thereto and each step hinged centrally, adapting said stiles to 55 move toward and from each other and to fold and extend the steps correspondingly, brace bars comprising a plurality of parts pivoted to the stiles and to the steps, and means for slidably connecting the parts of 60 each brace bar.

5. In a device of the class described the combination with pressed metal stiles of channel form, of steps foldable thereagainst and adapted to be concealed in the channel 65 bars when folded, brace bars for said steps, each brace bar extensible longitudinally and adapted to fold in said channel bars and to be concealed therein, props hinged to said stiles and steps and capable of being folded 70 upon the stiles and laterally upon each other.

6. In a device of the class described the combination with front stiles of steps secured thereto, rear stiles or props hinged to the front stiles, braces connecting said front 75 stiles and the steps, bars connecting the rear stiles, extensible brace bars connecting said bars and the rear stiles and all of the braces and brace bars automatically collapsible when the ladder is inverted to permit fold- 80 ing the ladder to small space.

7. In a ladder the combination with pressed steel stiles of steps secured thereto adapted to fold thereagainst, props hinged to said stiles, bars or straps connecting the 85 props hinged centrally permitting the props to fold relatively each other and extensible bars securing the props and stiles the desired distance apart when open, each extensible bar formed of a plurality of parts, 90 one of said parts slotted and means secured to one of the parts for engaging in said slot.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

JOHN J. DENNIS.

Witnesses:

K. E. HANNAH,
J. W. ANGELL.