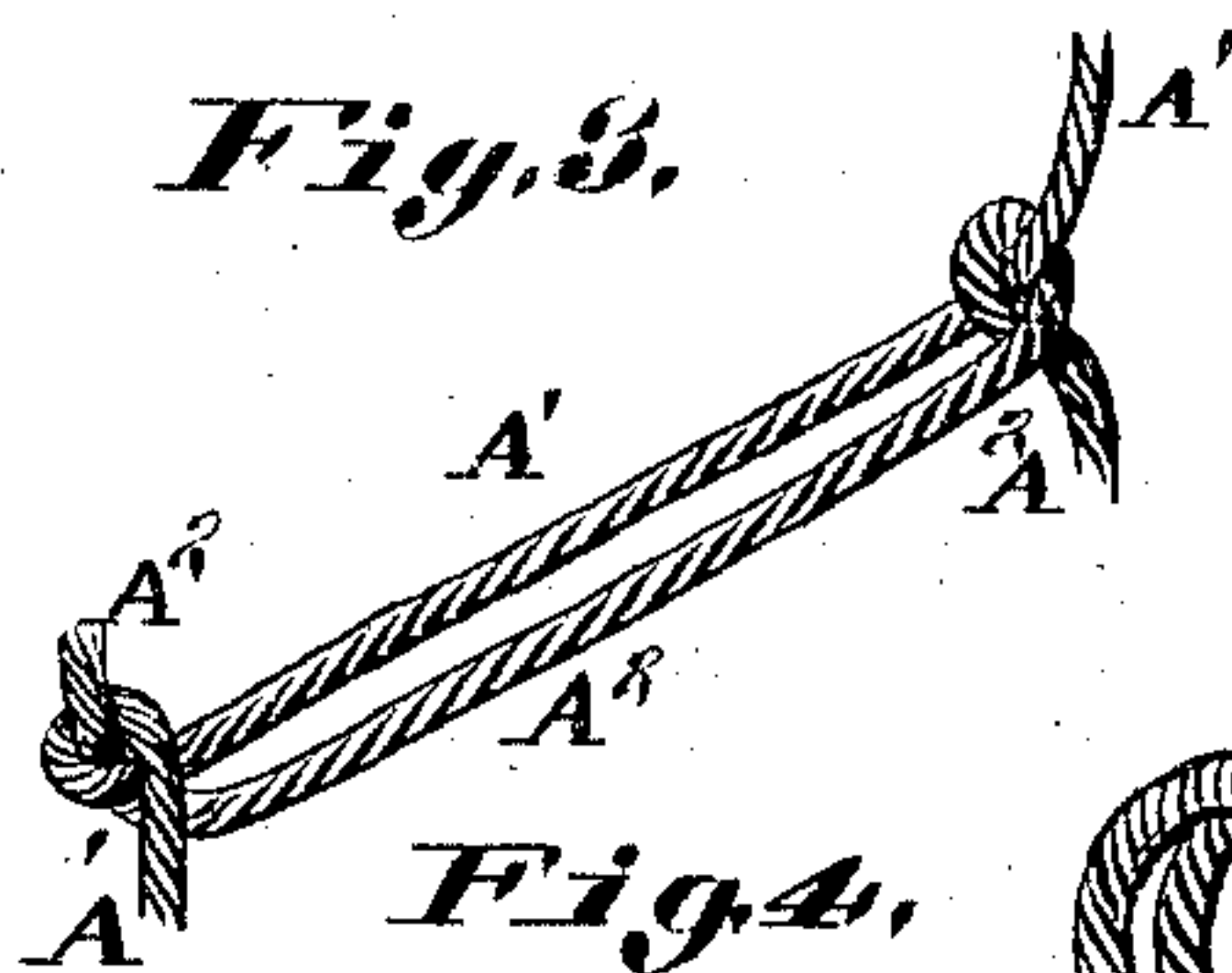
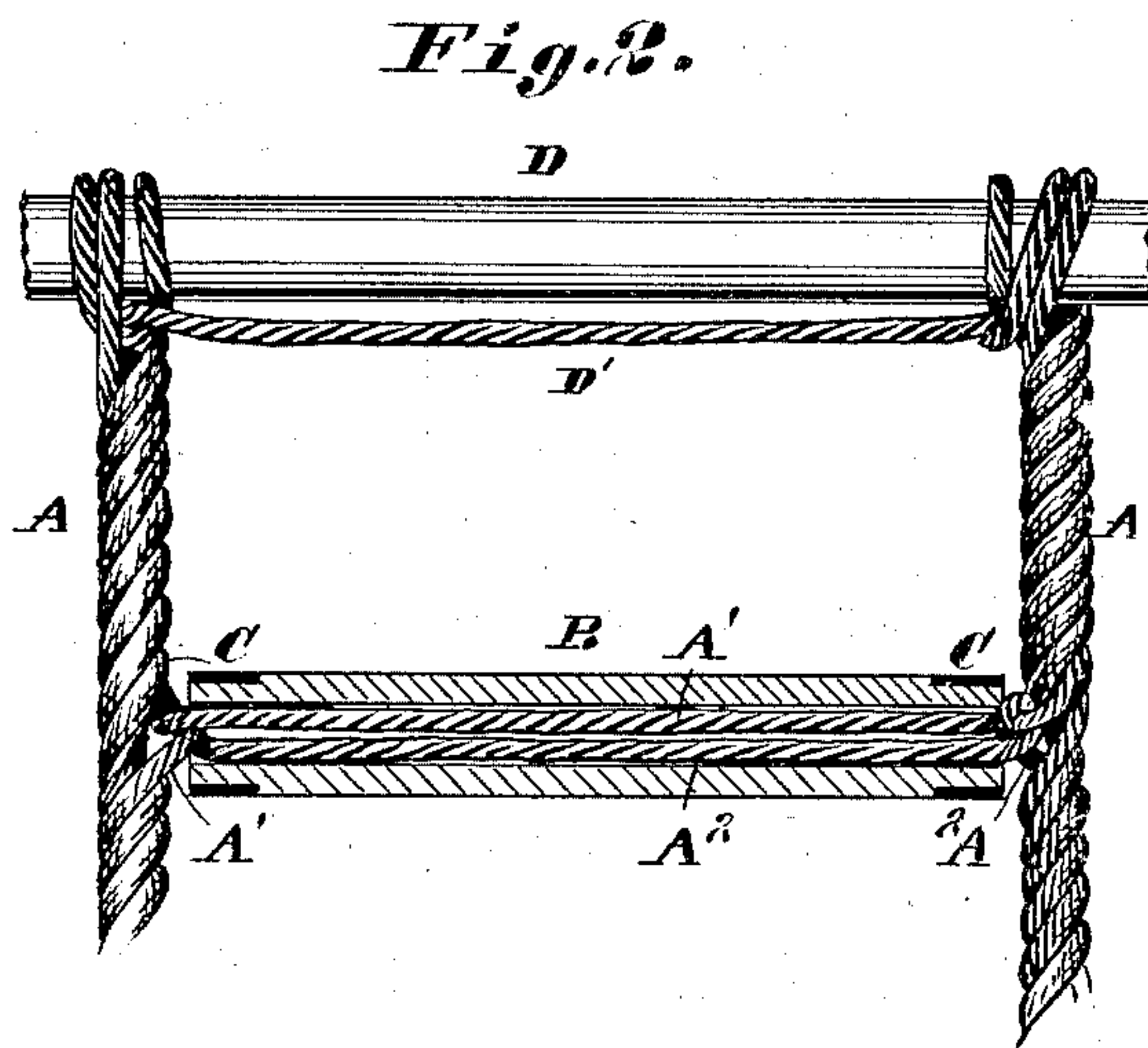
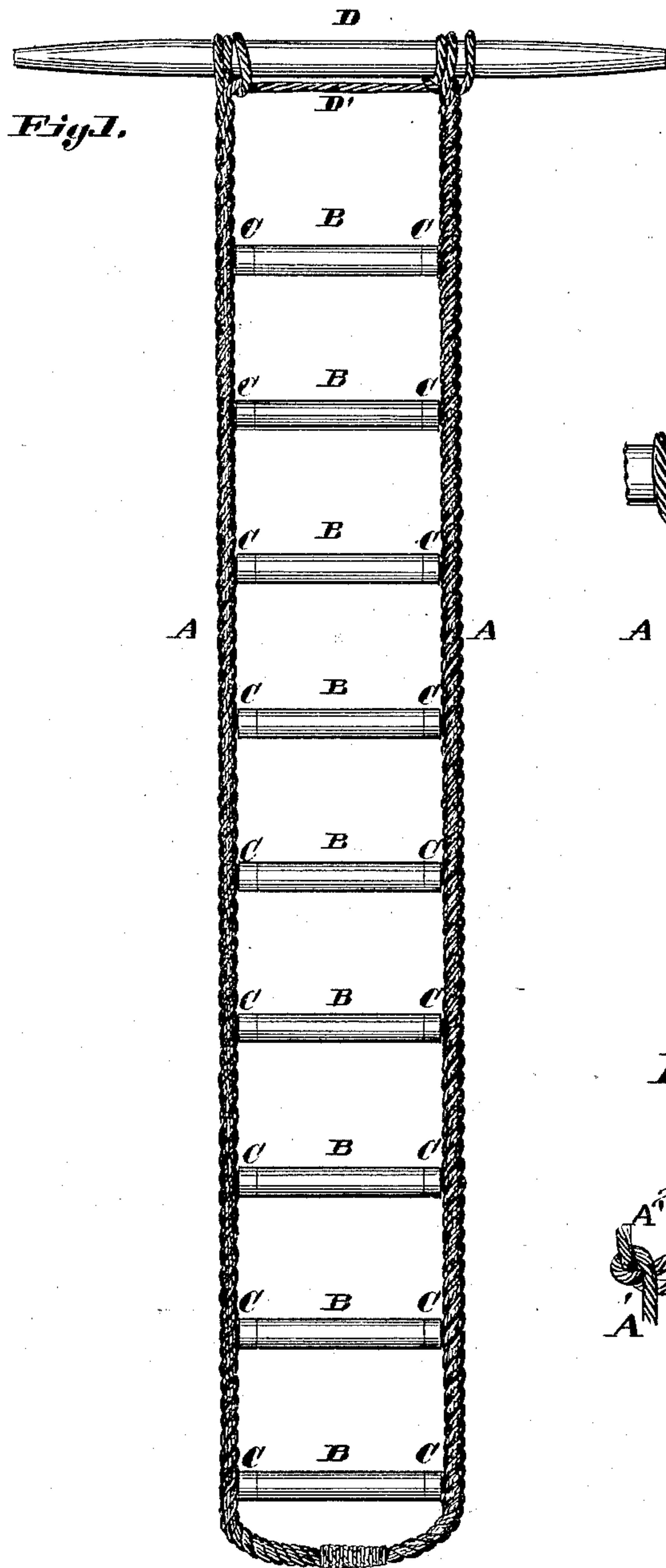


(No Model.)

P. BRENDEL.
FLEXIBLE LADDER.

No. 277,672.

Patented May 15, 1883.



Attest;
J. F. Sawyer.
Chas. C. Buckley

Inventor:
Philipp Brendel
By Knight Bros
Attys.

UNITED STATES PATENT OFFICE.

PHILIPP BRENDEL, OF ST. LOUIS, MISSOURI.

FLEXIBLE LADDER:

SPECIFICATION forming part of Letters Patent No. 277,672, dated May 15, 1883.

Application filed February 20, 1883. (No model.)

To all whom it may concern:

Be it known that I, PHILIPP BRENDEL, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Ladders, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is an elevation of a complete ladder of my improved construction, which may be of any desired length. Fig. 2 is a detail view of same, one of the steps or rounds being shown in section. Figs. 3 and 4 are perspective views, showing the manner of arranging the sides.

My invention relates to a ladder intended more especially for use as a fire-escape; and my invention consists in points of novelty hereinafter fully described and claimed.

Referring to the drawings, A represents the sides of the ladder, which consist of ropes, and B the steps or rounds, which are hollow and preferably made of wood; but they may be made of any other suitable material. The steps are secured to the sides by strands of the ropes passing through them, (see Fig. 2)—as, for instance, one of the strands, A', of one of the ropes and one, A², of the other rope would pass through a step in opposite directions, and each be lapped around the other, (see Figs. 2 and 3,) and then be twisted into the bodies of the ropes until they come to the next step and then they or two other strands are passed back through this step, and so the operation goes on until a ladder of any desired length is made.

A ladder thus made is strong, light, and durable. It can be folded up into a small compass, and the steps are always held in their proper relative positions. When the steps are made of wood or other material that might split they may be provided on the ends with metallierings C. When the ladder is intended only for a fire-escape a cross-bar, D, may be secured to one end by twisting the ropes around it and connecting them by one of the strands

D', as shown. When the ladder is completed the ends of the ropes may be secured together, as shown in Fig. 1, to keep them from untwisting. When the sides of ladder are composed of sufficiently small ropes they may pass bodily through the steps; but, generally speaking, this would be impracticable, as the steps would have to be larger than necessary in proportion to the sides. The use of the cross-bar is to sustain the ladder in case of fire by placing it across the window, thus forming a very convenient and safe escape, and as the ladder can be folded up, so that it takes but little room, travelers can carry it from place to place.

I claim as my invention—

1. A ladder composed of rope sides and hollow steps, the steps being secured to the sides by strands of the ropes passing therethrough, substantially as shown and described, for the purpose set forth.

2. A ladder composed of rope sides and hollow steps, the steps being secured to the sides by strands passing therethrough in opposite directions, and then being wrapped around each other and twisted into the bodies of the ropes, substantially as set forth.

3. A ladder composed of rope sides and hollow steps, the steps secured to the sides by strands of the ropes passing therethrough, and the ends of the ropes being secured together when the ladder is finished, substantially as and for the purpose set forth.

4. A ladder composed of rope sides and hollow steps connected together, the former having loops, connected by one of the strands, to receive a cross-bar, substantially as shown and described, for the purpose set forth.

5. A ladder composed of rope sides A, hollow steps B, through which strands A' A² of the ropes pass, and cross-bar D, secured to the sides, all substantially as shown and described, for the purpose set forth.

PHILIPP BRENDEL.

Witnesses:

SAML. KNIGHT,
GEO. H. KNIGHT.