

(No Model.)

3 Sheets—Sheet 1.

E. F. STECK.
EXTENSION LADDER.

No. 585,129.

Patented June 22, 1897.

Fig. 4.

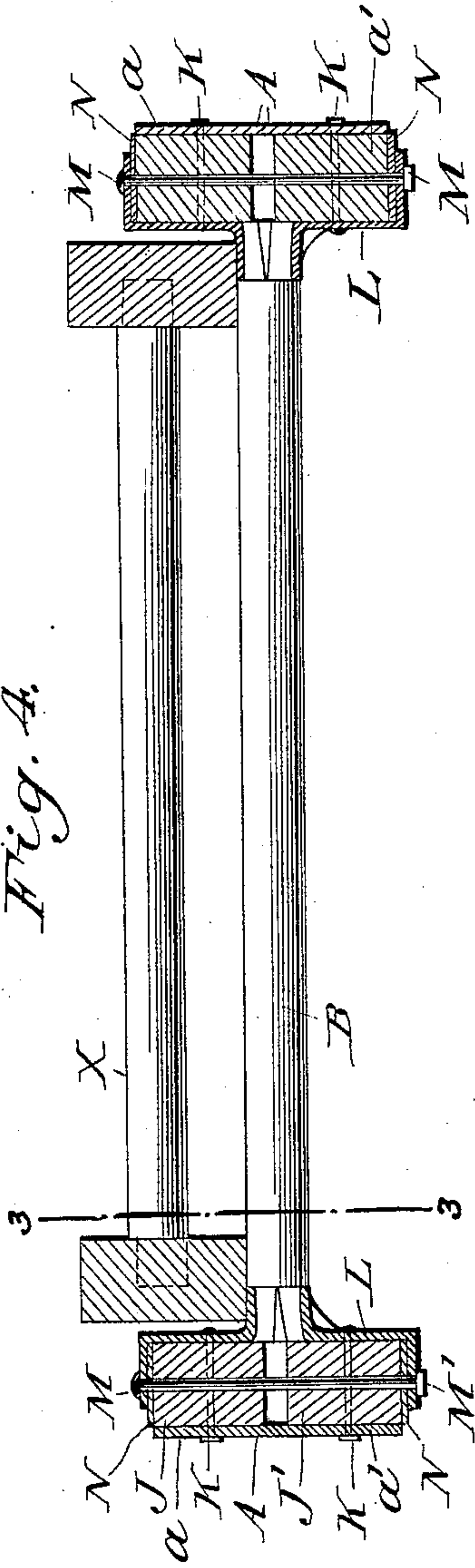
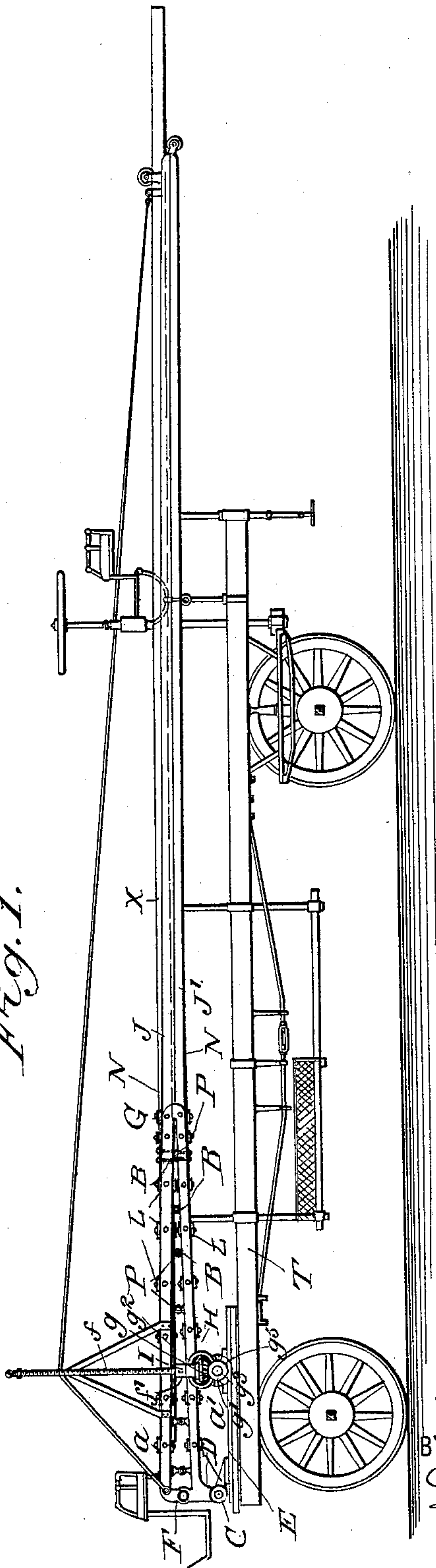


Fig. 1.



WITNESSES:

W. H. Humphrey.
J. Green.

INVENTOR

Ernst F. Steck

BY *Ernst F. Steck*

ATTORNEYS

(No Model.)

3 Sheets—Sheet 2.

E. F. STECK.
EXTENSION LADDER.

No. 585,129.

Patented June 22, 1897.

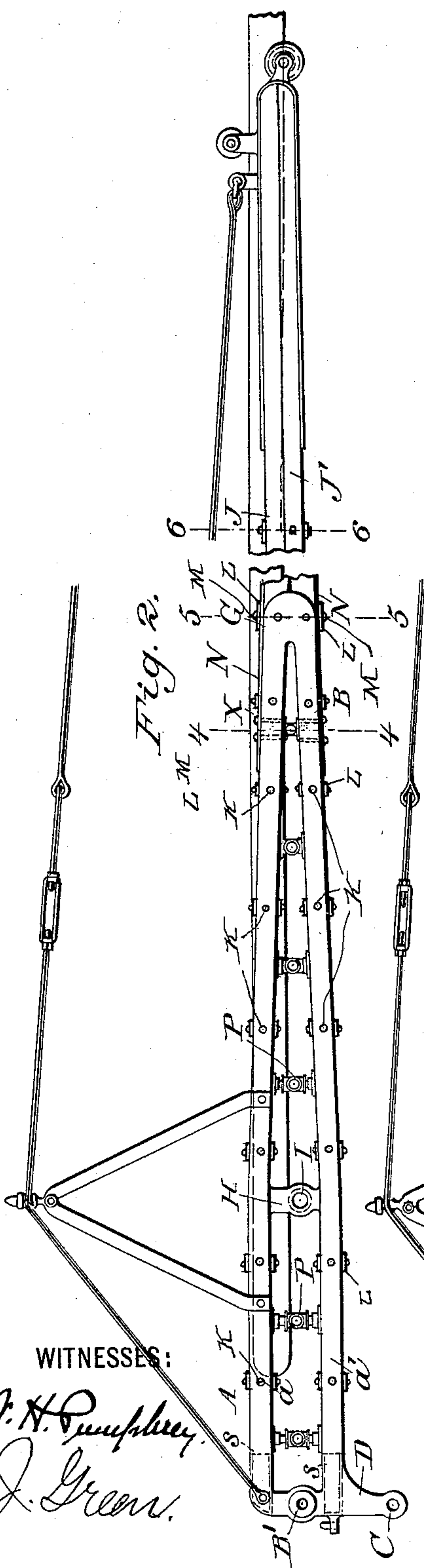
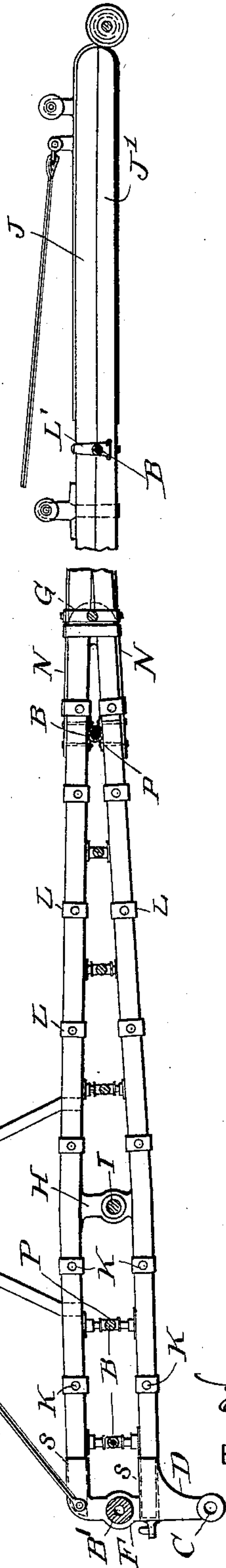


Fig. 3.



WITNESSES:

N. H. Humphrey
J. Green

INVENTOR

Ernest F. Steck

BY

Hughes Bros

ATTORNEYS

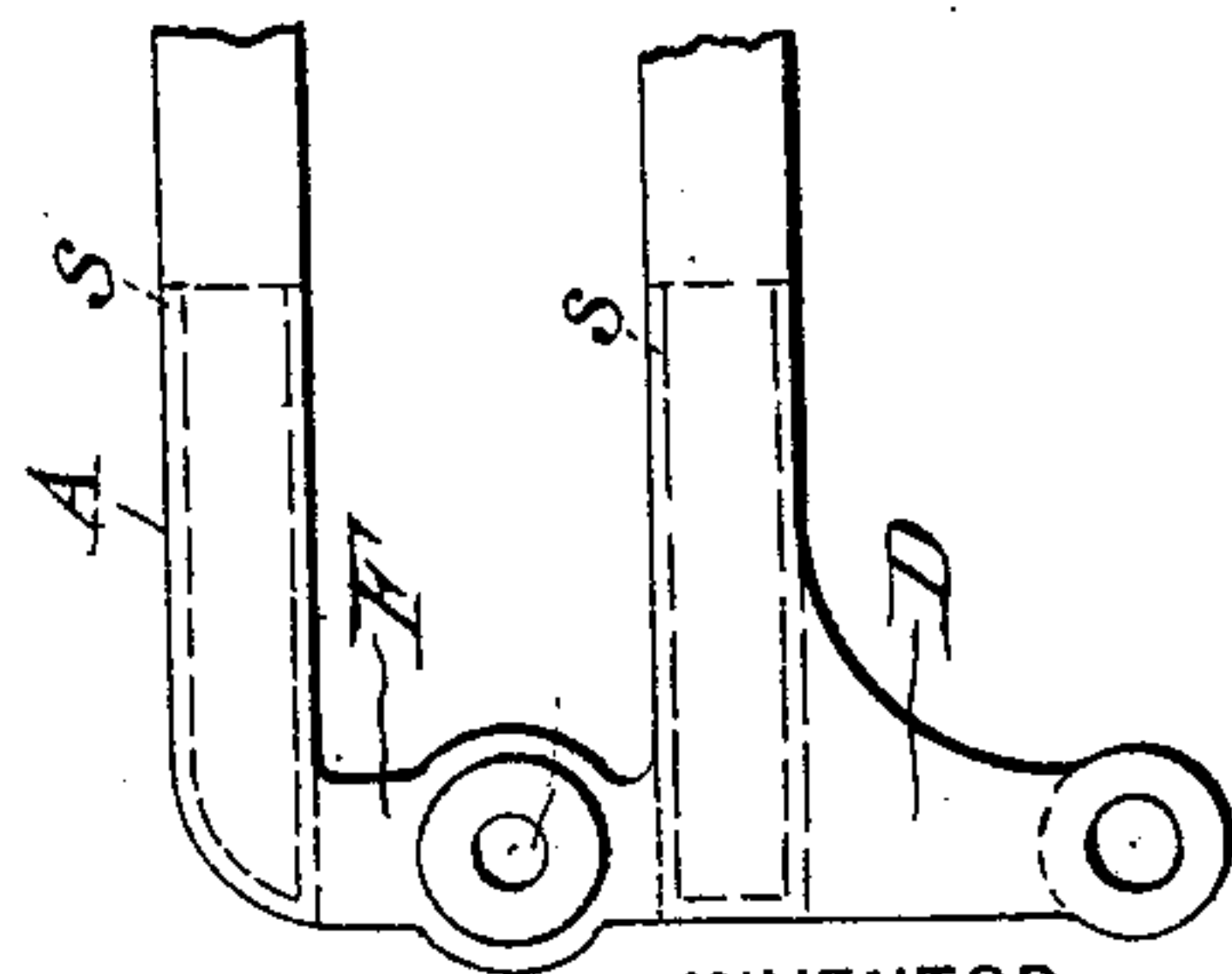
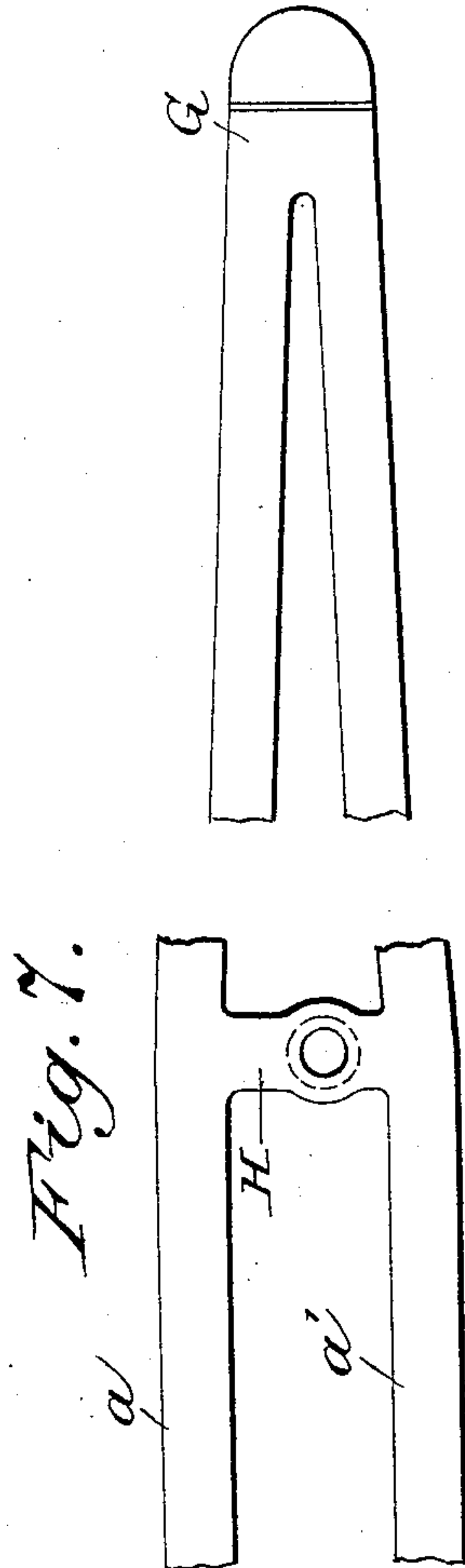
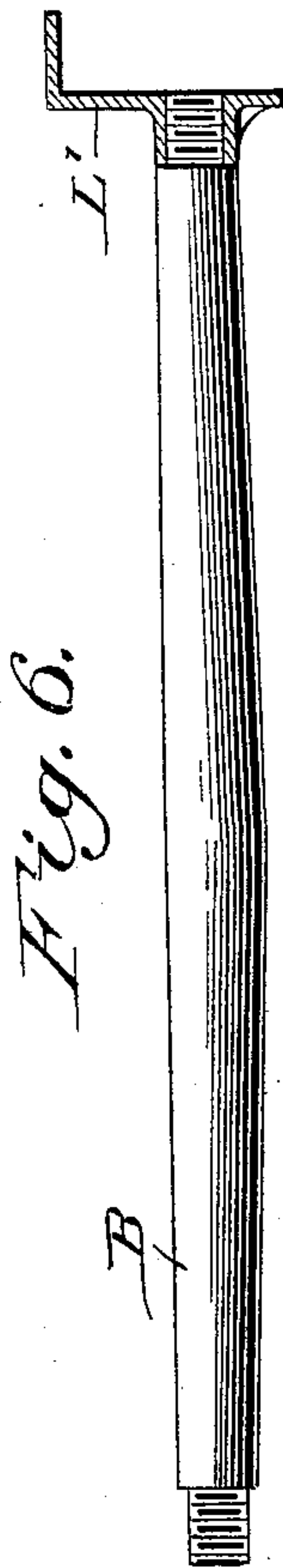
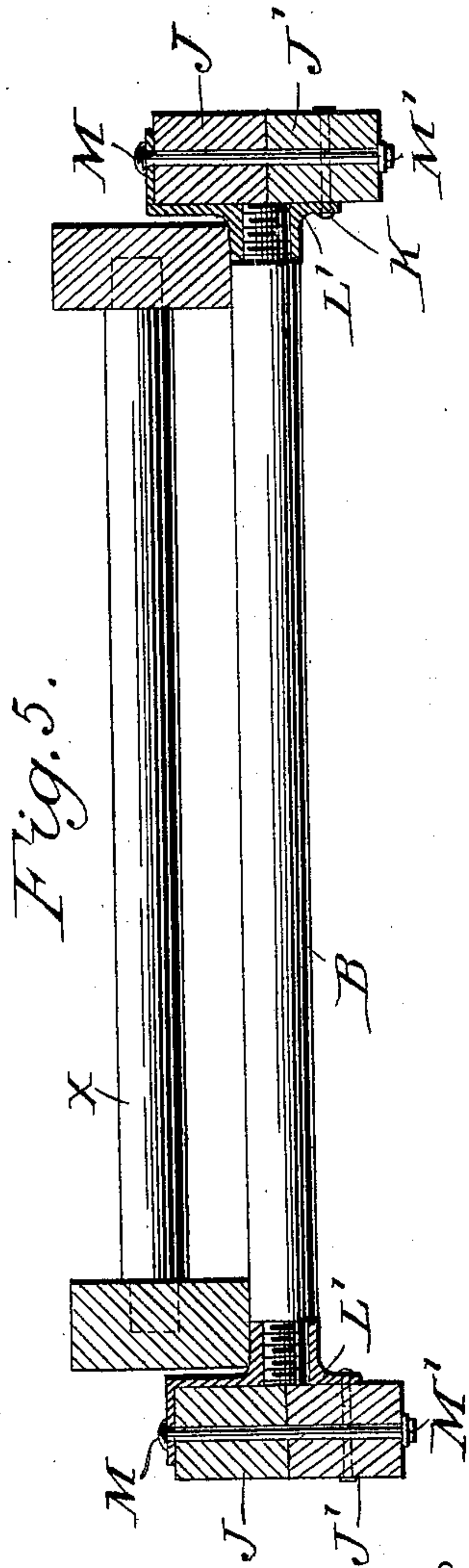
(No Model.)

3 Sheets—Sheet 3.

E. F. STECK.
EXTENSION LADDER.

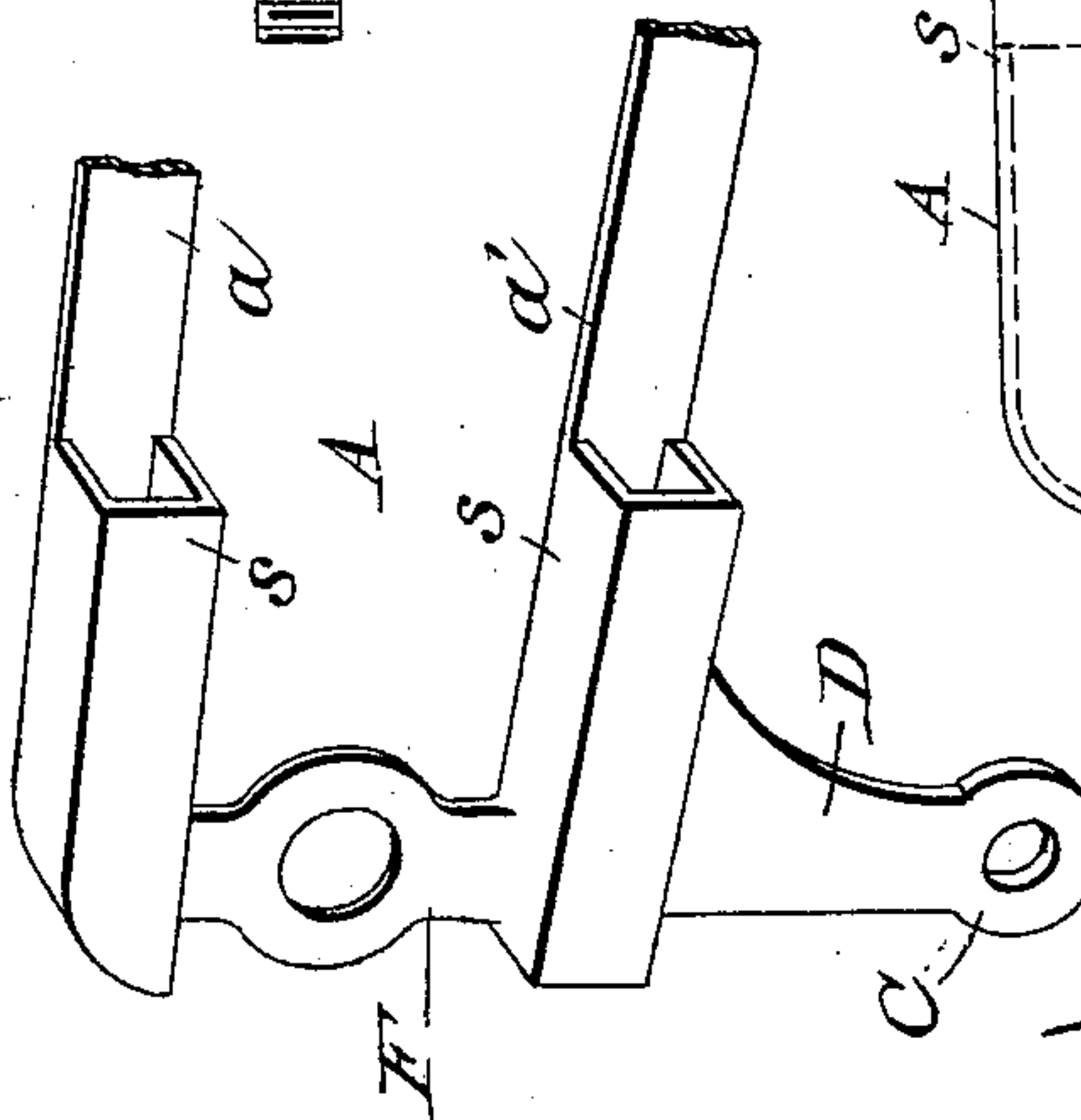
No. 585,129.

Patented June 22, 1897.



WITNESSES:

W. H. Humphrey
J. Green,



INVENTOR

E. F. Steck
BY *Ames & Sons*
ATTORNEYS

UNITED STATES PATENT OFFICE.

ERNST F. STECK, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE FIRE EXTINGUISHER MANUFACTURING COMPANY, OF SAME PLACE AND NEW YORK, N. Y.

EXTENSION-LADDER.

SPECIFICATION forming part of Letters Patent No. 585,129, dated June 22, 1897.

Application filed October 14, 1896. Serial No. 608,810. (No model.)

To all whom it may concern:

Be it known that I, ERNST F. STECK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Extension-Ladders, of which the following is a specification.

This invention, I may say, particularly relates to an improved form of truss employed by me in the main section of an extension-ladder, the object being to secure greater strength and efficiency with a given amount of weight, so that in the elevating operation the manipulation will be attended with as little expense of energy as possible without endangering the required strength of the structure or interfering with its efficiency in any manner.

Heretofore in extension-ladders employed in connection with aerial trucks I have extensively introduced a form substantially as shown, described, and claimed by me in United States Patent No. 348,594, dated September 7, 1886, which ladder is exceedingly efficient and serves the purpose for which it is intended satisfactorily, except that the point of weight militates to an extent against it, and I therefore aim in my present invention and device to depart from this drawback and to produce a trussed or semitrussed ladder which will answer the requirements both as to strength and lightness. To this end I have devised a short truss of angle iron or steel and form in connection therewith an extension of wood, the metallic part of the truss being introduced at the place where the greatest strain is encountered and the wooden extensions being placed where lightness is, from the very nature of the case, to be seriously considered.

My invention also consists in the particular construction of this semitrussed ladder and in the details which I have devised for carrying my invention into effect.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 represents a side elevation of a hook-and-ladder truck or aerial truck, upon which is mounted one of my improved extension-ladders. Figure 2 is a side elevation of my improved extension-ladder removed from the truck. Fig. 3 is a longitudinal section of the

same on the line 3 3, Fig. 4. In this figure the extensible portion is removed to more clearly show the construction of the trussed section of the semitrussed ladder. Fig. 4 is a cross-section on the line 5 5, Fig. 2. Fig. 5 is a cross-section on the line 6 6, Fig. 2. Fig. 6 is a detail view. Fig. 7 represents a broken side elevation of a side iron or one member of the metallic portion of my semitrussed ladder. Fig. 8 is a perspective view of a detail.

In the drawings, A represents a side iron which forms one member of the metallic portion of my semitrussed ladder, these side irons being connected together at the lower or inner end by rod B', which serves as a journal for a drum, by means of which the extension portion of the ladder is raised and lowered.

The ladder is pivoted at C to the truck T in bearings upon the supporting-standards D, extending upwardly from the turn-table E of the truck.

Each side iron is formed of an upper and a lower part $a a'$, the two parts being connected at the front end by means of the attaching-strip F. This strip or end piece is enlarged midway or approximately midway of its length to permit the entrance and attachment of the rod B'. From the front end of the side iron A the parts $a a'$ gradually converge, terminating at their meeting point G. Between the two ends of the side iron is another connecting-strip H, constructed similarly to the connecting-strip F and affording accommodation and support to the rod I.

In Fig. 7 the particular construction of the side irons is shown. They are formed of flat pieces of metal and at the points through which extend the rods B' and I and the pivoting-pin C suitable bearings are provided; also at the front ends of the side irons are provided sockets s , into which fit the terminals of the wooden side pieces J J'. The rungs B are supported in cross-pieces between the upper and lower parts $a a'$ of the side irons.

The ladder is raised and lowered in substantially the same manner as is shown in my previous patent hereinbefore referred to, and for which purposes I provide a pair of screws or threaded rods f . One of these screws is stationed opposite each side of the

ladder and arranged to pass through a nut f' , that is provided on the side of the ladder-section. Fig. 1 illustrates one of these swiveled nuts, the said nut being fitted to turn upon a pivot that is conveniently formed by a rod I, arranged to take the place of one of the ladder-rounds. Each screw is provided near its lower end with a bevel-gear g , fixed upon a stem portion of the screw, and these bevel-gears are engaged by bevel-gears g' upon a rotary shaft g^3 , that is mounted in bearings g^5 upon the upper oscillating section of the turn-table. The ends of this shaft extend beyond the bearings g^5 , and are adapted to provide arbors for a suitable key or handle, so that the shaft g^3 may be rotated in order to turn the screws through the mediation of the gears g and g' , and thus raise or lower the ladder. It will be understood that like connections are provided between each screw and the shaft g^3 , and that the shaft g^3 can be operated from either end. The lower stem portions of the screws are stepped in bearings g^2 , one of which is provided for each screw. For a detailed description of this portion of my apparatus I refer to the specification of my former patent.

Extending rearwardly from the side irons are these wooden side pieces J J'. The manner of fastening the iron side pieces to the wooden side pieces is shown in Fig. 4. The wooden side pieces are arranged inside and the iron side pieces are arranged outside. They are secured together by bolts K. At L, I show castings through which these bolts pass, said castings being provided at each end with lips or shoulders which overlap the wooden sides at top and bottom and prevent the wood from splitting. The wooden sides are drawn together by means of bolts M and locked to the proper position by nuts M'. I provide flat iron pieces N on the top and bottom of the wooden timbers. Where considerable strain comes upon the timbers, these flat iron pieces act as washers to prevent the

bolts from injuring the wood. The plates N also extend under the lips of castings L and thereby distribute the strain on the wooden side pieces by said lips.

In some places, as shown in Figs. 5 and 6, the casting L becomes a bracket. The form L', as illustrated in Fig. 6, is made to accommodate a hollow iron rung. (See also Fig. 3.)

The two divisions of the semitrussed ladder are connected together very much in the manner shown by me in my former patent, hereinbefore referred to. The braces P extend between the parts and are attached thereto in any suitable manner. They also serve as supports for the rungs B. The extension portion of the ladder is shown at X.

My construction of semitrussed ladder is novel, light of weight, and possesses sufficient strength to fulfil the work required of it.

It will be seen that I do not bore any holes in the wooden part of the ladder side for the purpose of securing the rungs, thus avoiding this tendency to weaken them, but support the rungs entirely from the receiving-castings L, and by reason of this structure also any rung can be removed and a new one inserted without disturbing the entire ladder structure, which points are novel and useful.

I claim—

1. A ladder having an iron truss at its lower end, constituted by converging iron plates with cross-pieces connecting them, and wooden side pieces clamped to said plates and extending above same to form the upper part of the ladder-support.

2. A ladder having at its lower end on each side converging iron plates forming a side iron, and wooden side pieces clamped respectively to said plates and bolted together at their upper portions.

ERNST F. STECK.

Witnesses:

E. J. MITCHELL,
J. W. TEHLE.