

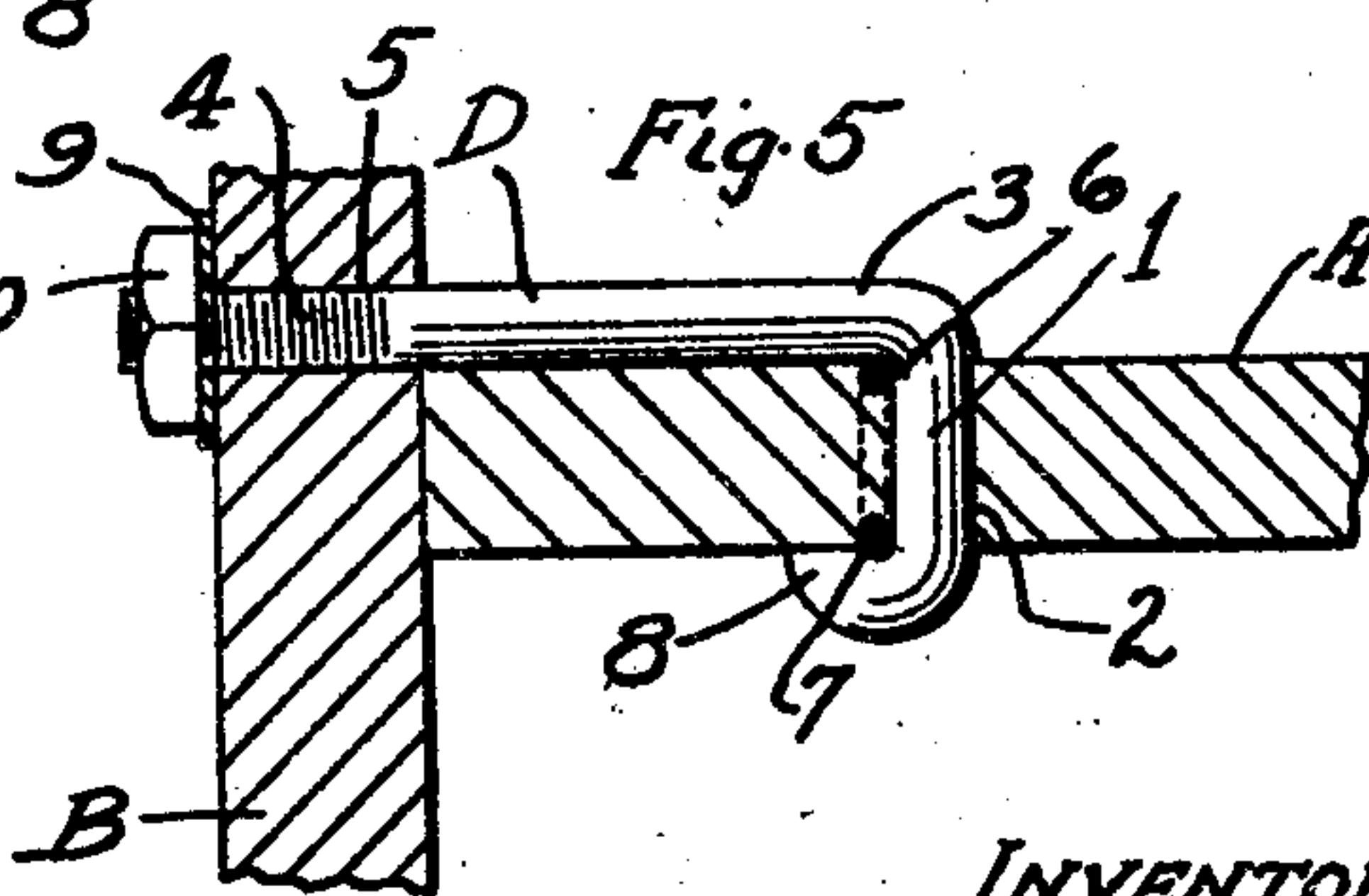
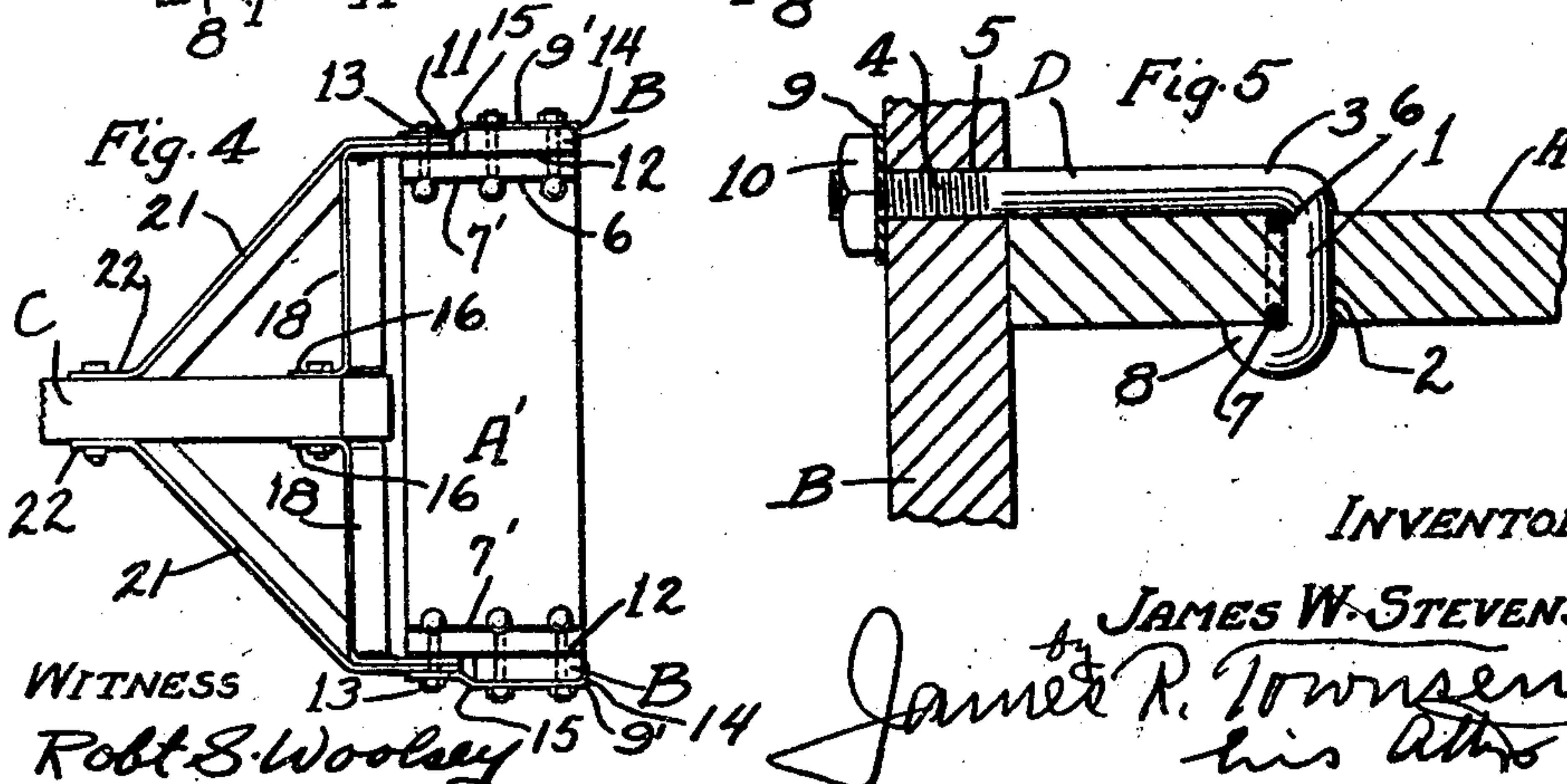
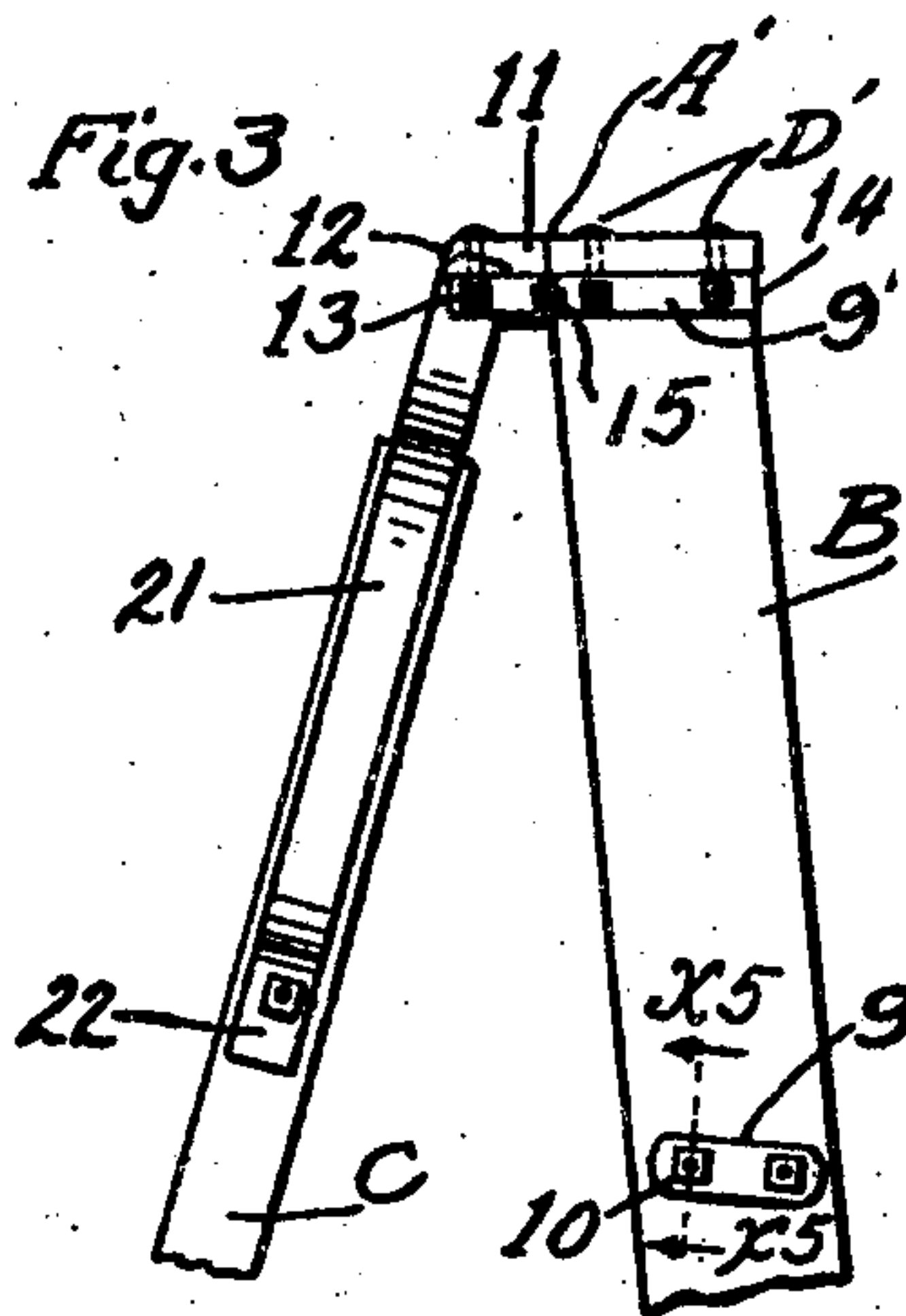
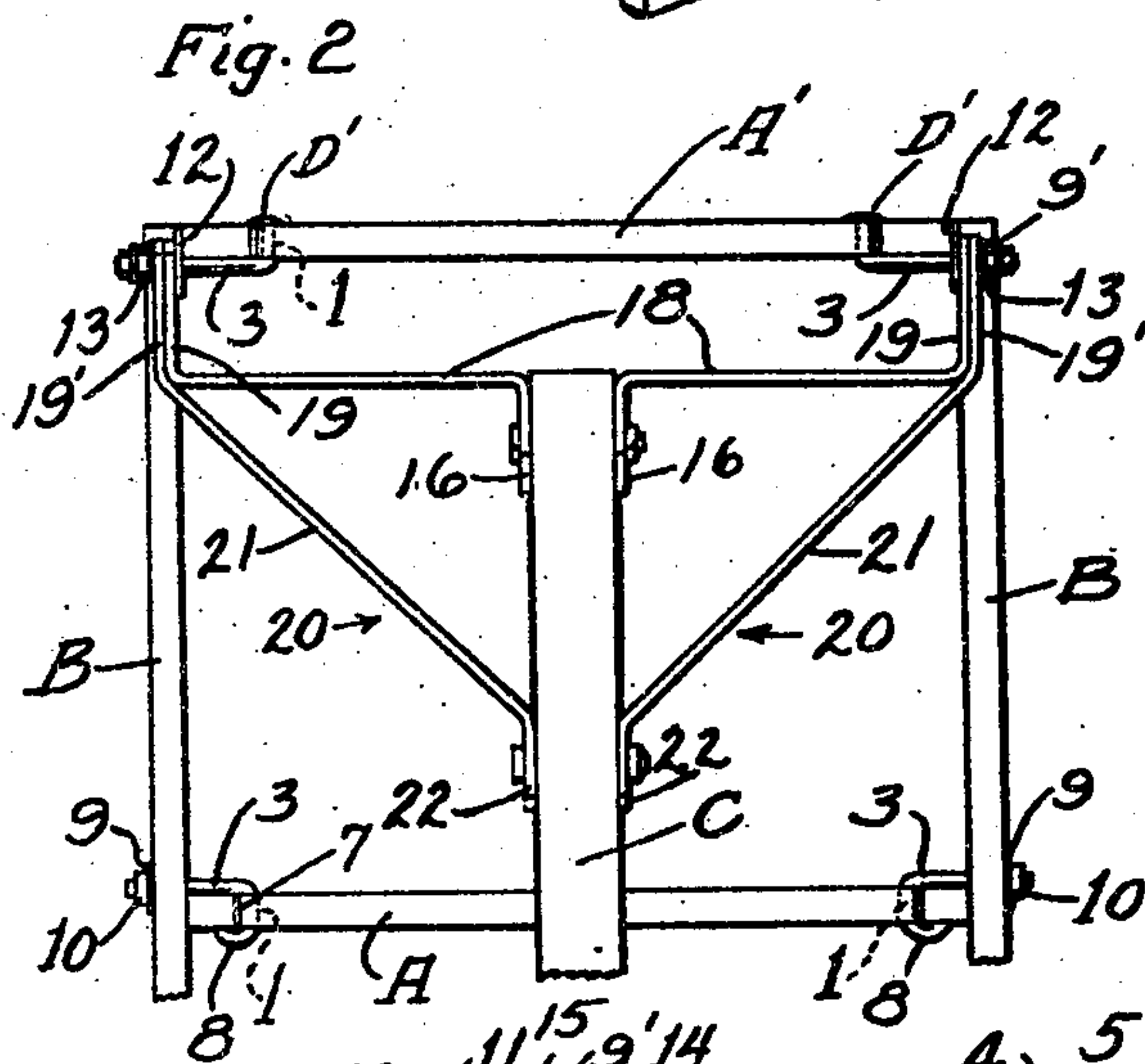
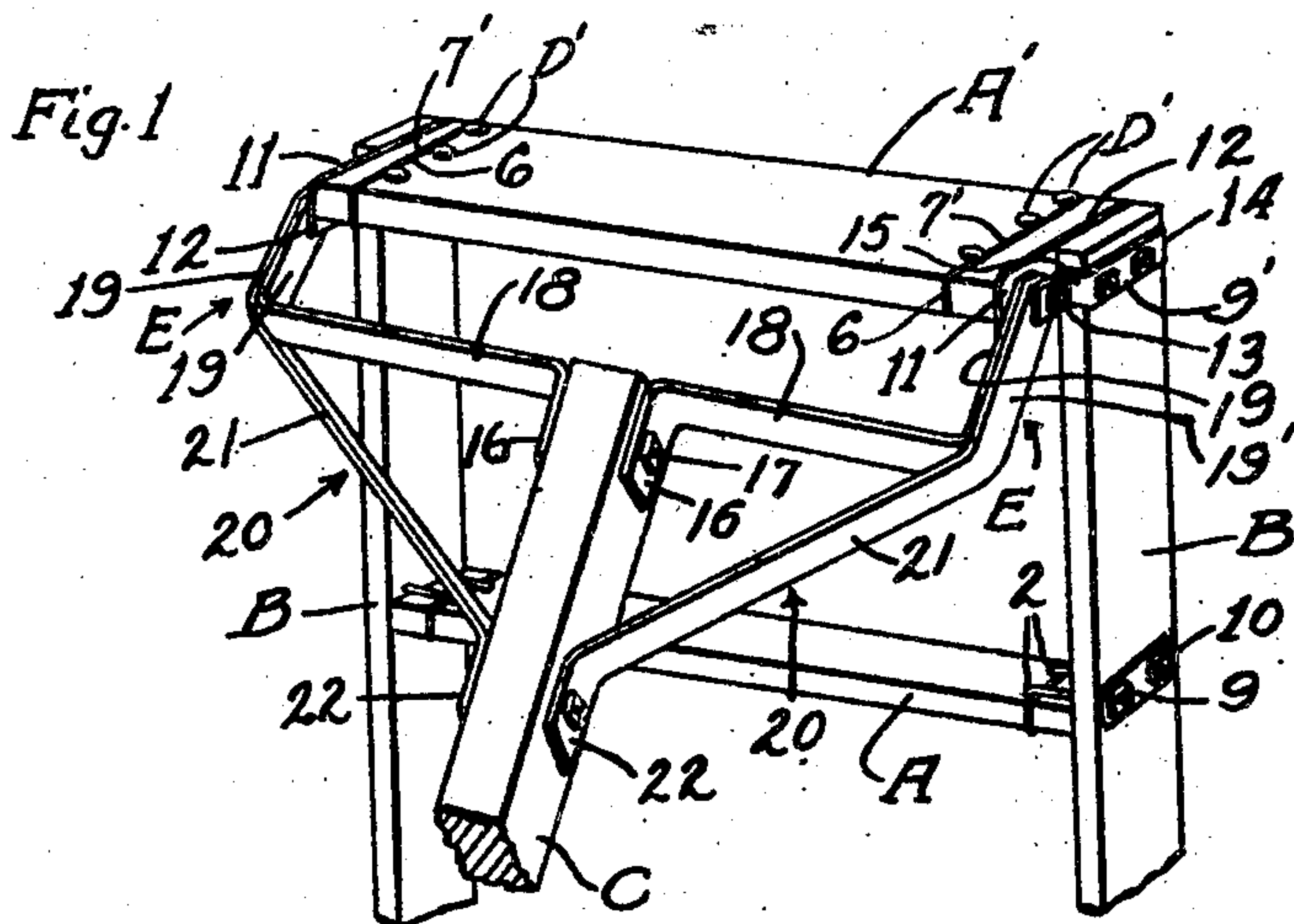
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J. W. STEVENSON

LADDER

Filed April 11, 1927



INVENTOR

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## UNITED STATES PATENT OFFICE.

JAMES W. STEVENSON, OF RIVERSIDE, CALIFORNIA.

## LADDER.

Application filed April 11, 1927. Serial No. 182,550.

This invention relates to ladders and more particularly to ladders having series of flat steps or treads and folding supporting frames constructed of wood.

5 An object is to provide a simple, durable and inexpensive means for connecting the treads with the stiles of a ladder, which may be installed with facility; which affords maximum rigidity and which prevents splitting of both the stile and tread.

15 Another object is to provide a fixture especially designed for steps having greater width than the stiles, which prevents splitting and breaking of the step portion projecting beyond the stile.

20 Another object is to provide a simple hinge fixture for connecting the elements of the folding frame with a step, which fixture provides maximum stability between the hinged elements and prevents splitting of the step.

25 Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detailed description and the appended claims.

The accompanying drawing illustrates the invention.

30 Figure 1 is a perspective view of the upper portion of a ladder embodying my improvements.

Fig. 2 is a rear elevation of the ladder.

Fig. 3 is a side elevation of the ladder.

Fig. 4 is a plan view of the ladder.

35 Fig. 5 is an enlarged vertical sectional elevation taken on line  $x^5$ , Fig. 3.

40 A designates the steps or treads, and B and C elements of the folding frame for the steps, the elements B forming the support, or stiles, for the steps and the element C forming a prop or brace to hold the stiles with the steps erect or in upright position for use.

45 The stiles B are constructed of wood, in the form of strips of rectangular, oblong section approximating two and one-half inches in width and one inch in thickness and of length varying according to requirements of use.

50 The treads A are made of the same material and their sectional dimensions are the same as the stiles and their lengths may vary according to width of ladder desired, but for ordinary purposes I prefer to make the treads approximately twelve inches wide at the top of the ladder and of progressively increasing length toward the bottom, as is

common in ladders, to provide a relatively broad expanse of supporting points of the stiles.

I prefer to make the folding frame for the steps, which includes the stiles, as a tripod, and as shown employ only a single element, which is designated C, as the prop, which I also make of wood, of a length substantially the same as the stiles and of a substantially square section approximating two inches.

60 The fixtures for connecting the treads with the stiles comprise bolts D, which are of substantially L-shape, the short arms 1 of which are unthreaded, headless and straight and are for extension through bores 2 formed substantially vertically through and adjacent each end of the treads. The long arms 3 are provided with screw threads 4, are straight and for extension through bores 5 formed transversely through the stiles.

Each tread has at each of its ends a pair of the bores 2 which are adjacent the edges of the tread and each tread has a score, or groove 6 at each of its ends immediately next the bores. Into the grooves I place bond wires 7 which surround the end portions of the treads and prevents splitting thereof and then insert the short arms 1 of the fixtures through the bores 2.

85 The free end of the arm 1 is then bent, headed or upset, or reversely bent as shown at 8 so that the bond wire is secured in the groove at both top and bottom faces of the tread.

90 The arms 3 of the bolts are then extended through the bores 5 of the stiles, a plate 9, slipped over the ends of the arms and nuts 10 turned on the arms and drawn tight against the plates. In this drawing of the nuts the bond wires prevent the arms 2 from tearing lengthwise through the steps and thus provide for a tight, rigid connection between the step and stile.

100 The top step A' is, as is common, of greater width than the remaining steps to provide for its use as a support for articles employed by the users of the ladder, and projects at its rear end beyond the stiles as shown at 11, in Figs. 1 and 3. The step A' is secured to the stiles in substantially the same manner as the remaining steps as by bond wires 7', bolts D', D' and a plate 9', with the exception that there is interposed between the stile and the step end a plate 12 having a length equalling the width of the step. The extended plate 12 provides for stiffening the



rear edge of the step which projects beyond the stiles and serves with the plate 9' as a support for a bolt 13, which is secured to the step as are the described bolts D', D'.

5 To provide for maximum strength of the stiles at their extreme top ends, the plates 9' are bent as at 14 to overlie the front edge and as at 15 to partially overlie the rear edge of the stile.

10 The hinge fittings E for attachment to the prop, the frame element C, comprise metallic straps having foot flanges 16 for securement to the prop, as by bolts 17, lateral arms 18, for extension at right angles from the prop and arms 19 for extension between the plates 15 9' and 12 and through which the bolts 13 are extended.

To lend rigidity to the hinge fittings E, I provide braces 20 which comprise arms 19' 20 overlying the arms 19 of the hinge fittings, diagonal brace-arms 21 and foot flanges 22 for securement to the prop at points below the foot flanges 15 of the fittings E.

25 The overlapping arms 19 and 19' and the relative arrangement of the arms 18 and 21 permit the use of relatively light weight

material; afford ample bearing for the bolts 13 and provide maximum rigidity of the prop.

I claim:

1. A ladder fixture comprising a bond for surrounding a tread, a pair of bolts of substantially L-shape for extension through the tread and through a stile, said bolts adapted to engage the bond at both its top and 35 bottom faces, a plate to connect the bolts and to overlie the stile and nuts on said bolts, a second plate for location between the stile and tread, and a fixture for securement to a ladder prop hinged to said plates. 40

2. A ladder fixture comprising a bond for surrounding a tread adjacent an end thereof to prevent splitting; a pair of bolts of substantially L-shape for extension through the tread and through a stile, said bolts adapted 45 to engage the bond at both its top and bottom faces; a plate to connect the bolts to overlie the stile, and nuts on said bolts.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 50 30th day of March, 1927.

JAMES W. STEVENSON.