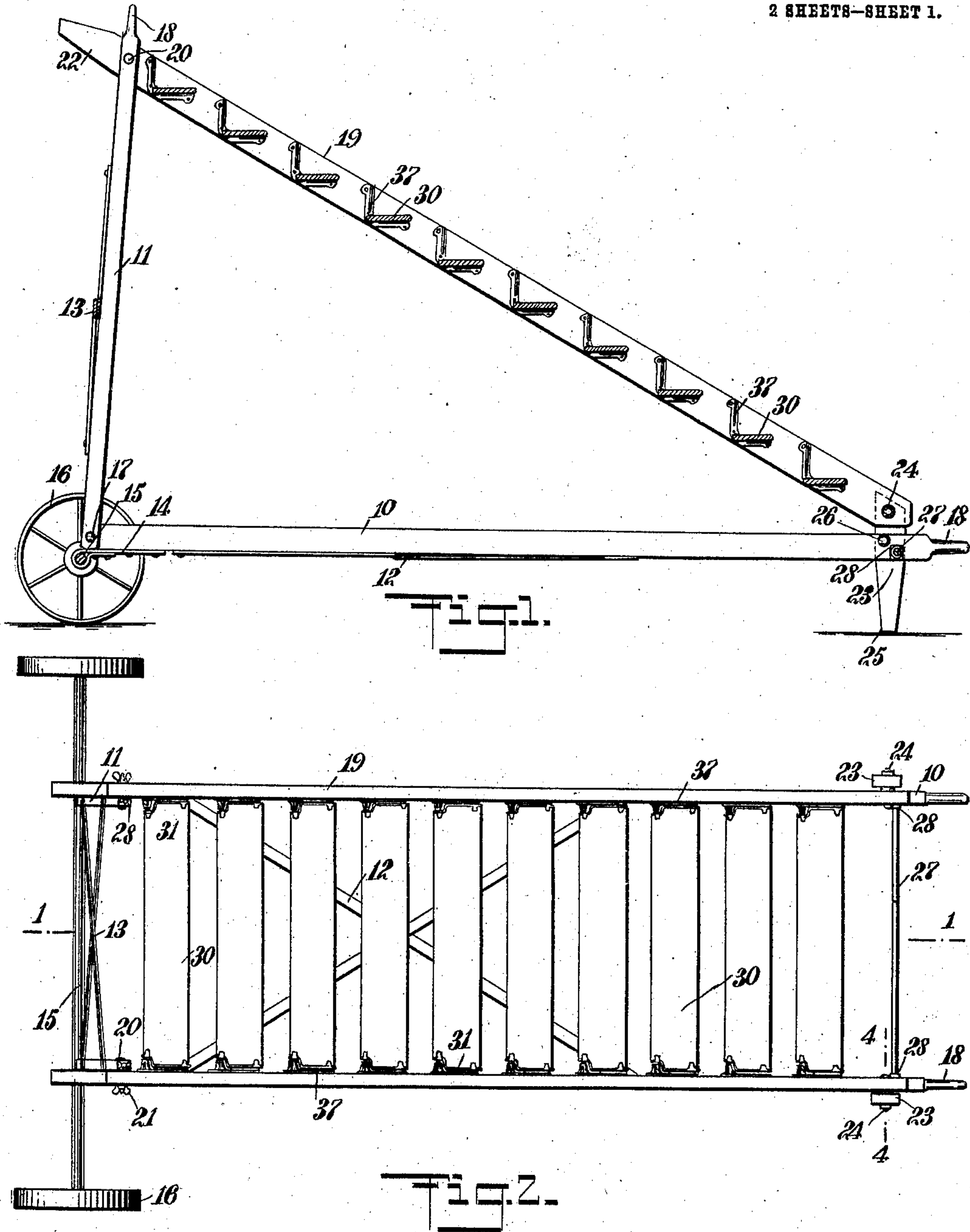


H. A. SAGER.
LADDER.
APPLICATION FILED SEPT. 26, 1909.

963,474.

Patented July 5, 1910.

2 SHEETS—SHEET 1.



WITNESSES

Ben. Joffe
John K. Brachvogel

INVENTOR

Harry H. Sager

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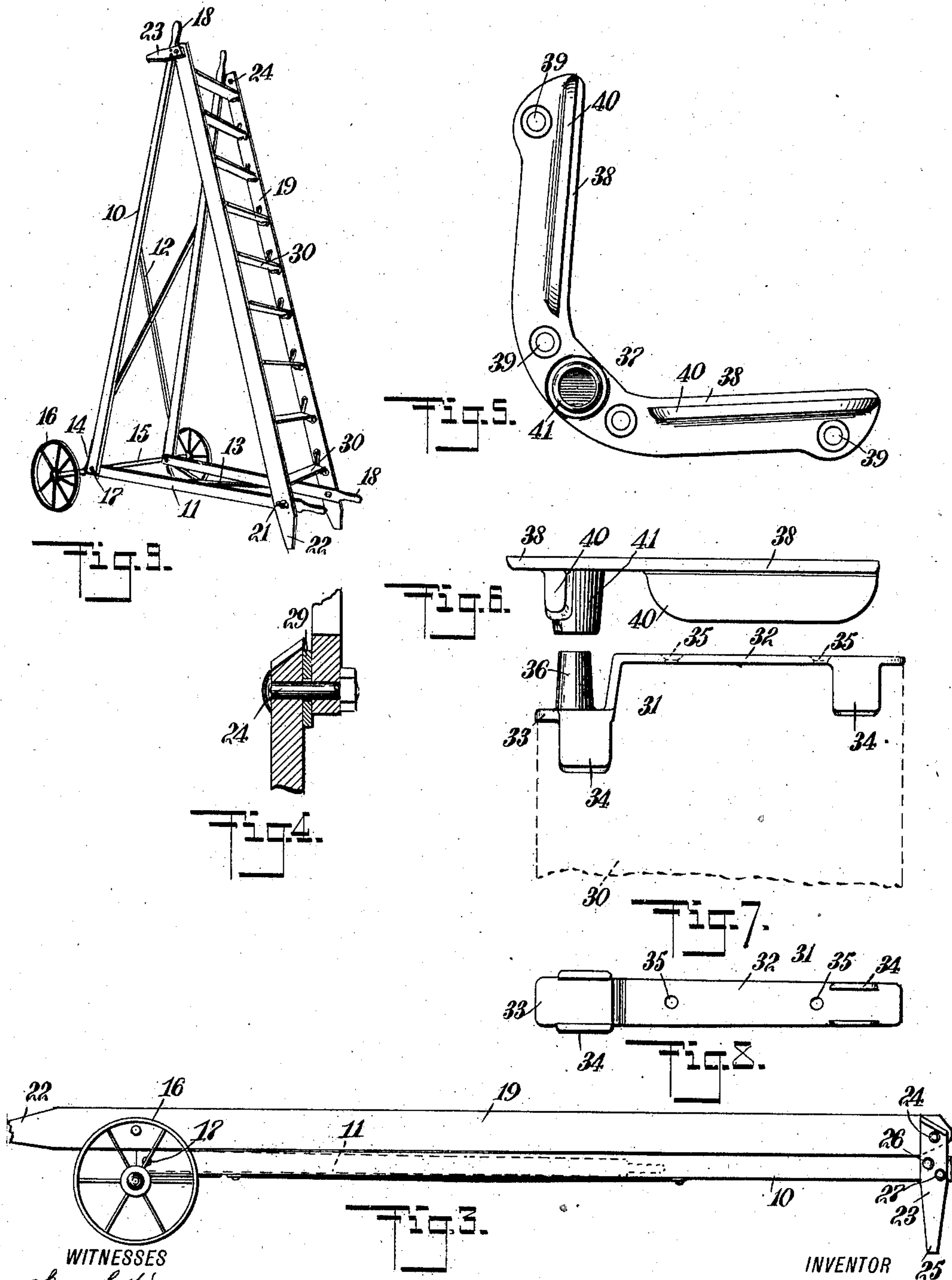
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UNITED STATES PATENT OFFICE.

HARRY A. SAGER, OF MISSOULA, MONTANA.

LADDER.

963,474.

Specification of Letters Patent.

Patented July 5, 1910.

Application filed September 25, 1909. Serial No. 519,560.

To all whom it may concern:

Be it known that I, HARRY A. SAGER, a citizen of the United States, and a resident of Missoula, in the county of Missoula and State of Montana, have invented a new and Improved Ladder, of which the following is a full, clear, and exact description.

This invention relates to ladders, and more particularly to a ladder adapted to be arranged in a plurality of positions, whereby the height of the ladder can be varied, and having steps or rungs movable into a plurality of positions.

The object of the invention is to provide a simple, strong and durable ladder, which is inexpensive to manufacture, which can be easily moved from place to place, which can be folded into a compact form for storing or shipping, and which can be arranged in a plurality of positions to permit its height to be varied.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a longitudinal section on the line 1—1 of Fig. 2; Fig. 2 is a plan view of an embodiment of my invention; Fig. 3 is a side elevation of the device, showing the same folded; Fig. 4 is an enlarged transverse section on the line 4—4 of Fig. 2; Fig. 5 is a side elevation of a detail, showing one of the brackets for holding the steps in position; Fig. 6 is a plan view of the bracket; Fig. 7 is a plan view showing one of the end fixtures for pivotally mounting the step in place, and indicating the step in dotted outline; Fig. 8 is a side elevation of the fixture; and Fig. 9 is a perspective view of the ladder.

Before proceeding to a more detailed explanation of my invention, it should be clearly understood that while the ladder is particularly useful in orchards and the like, in harvesting fruit or other produce, it can be advantageously employed for other purposes which necessitate ladders that can be easily moved from place to place, and the height of which can be varied.

I prefer to employ wheels for supporting my ladder so that it can be moved from

place to place without difficulty, handles being provided to permit its being wheeled in the same manner as a wheel-barrow is propelled. As will appear more clearly hereinafter, it is foldable into compact form, to permit its being stored or shipped.

Referring more particularly to the drawings, I employ a frame comprising pairs of substantially parallel frame members 10 and 11 connected respectively to cross braces 12 and 13, and angularly disposed with respect to each other. The members 10 at their lower ends have strap bearings 14 in which is journaled a shaft 15 extended laterally beyond the frame members and having the supporting wheels 16 mounted thereon. These are of any suitable form, and may, for example, be of cast-iron. The members 10 and 11 are pivotally secured together by means of suitable bolts 17 or the like. At each end, these members are formed into handles 18 so that the ladder can be conveniently wheeled from place to place.

I employ ladder sides or rails 19 secured near the ends of the members 11 by means of bolts 20 having wing nuts 21 to permit their manual removal. The ends of the rails extend beyond the members 11 and are tapered to form feet 22 adapted to rest upon the ground. At the opposite ends, the rails have laterally disposed legs 23 secured thereto by means of bolts 24. The legs terminate in feet 25 adapted to rest upon the ground, and are secured to the members 10 by means of bolts 26. A rod bolt 27 extends through the members 10 and the legs 23, and has retaining nuts 28 at the inside and the outside respectively of the members 10 and the legs. Washers 29 are loosely mounted upon the bolt 24 between the legs and the ladder rails, for a purpose which will appear more clearly hereinafter.

Between the ladder rails 19 are positioned the rungs or steps 30, consisting of wooden boards or the like, and each having at each end a fixture 31 comprising an elongated body 32 having offset ends 33 and provided with laterally extending lugs 34 between which are positioned the steps. The body of each fixture has openings 35 therethrough, adapted to receive the retaining wood screws which enter the steps. At the offset part, each fixture has a trunnion 36 for pivotally mounting the step in position, as will appear more clearly hereinafter. Needless to say, the step is suitably cut away at one

corner, to receive the offset part of the fixture.

At the inside, each of the ladder rails carries a plurality of brackets 37 consisting of angularly disposed parts 38 each having openings 39 to receive screws by means of which they are held in place. Each of the bracket arms has a flange or rib 40 constituting a stop or support for its step, and has furthermore, a hub bearing 41 adapted movably to receive one of the trunnions 36. In this way the steps can be pivotally mounted between the ladder rails and they are adapted to rest in a plurality of positions upon the respective supports 40, in accordance with the position of the ladder frame. The fixtures and the bracket may be fashioned from any suitable material such as malleable iron, cast-iron, or the like.

The frame members 10 are materially longer than the members 11, the relative proportions depending upon individual preference or special conditions. When the feet 22 rest upon the ground, the members 10 constitute the vertical struts of the ladder frame. When, on the other hand, the feet 25 rest upon the ground, the members 11 constitute the uprights. In the latter case, the effective height of the ladder is materially less than the effective height in the former case. It will be understood that the ladder frame is swung about the axle, in moving it from one position to another. In each case the steps assume the operative position, owing to their pivotal engagement with the rail, the brackets being so arranged that they suitably support the steps in each case.

The ladder can be folded when not in use, by removing the wing nut 21 and slightly raising the ladder proper, to permit the members 11 to be swung inward to positions within and between the members 10, so that the ladder rails can then be swung downward, pivoting upon the bolt 24, into position upon the members 10, as is shown in Fig. 3. The washers 29 are provided to permit the ladder rails to swing freely about the bolt 24.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent:—

1. A ladder, comprising a frame having members angularly disposed relative to one another, and rails connecting said members, and provided with pivoted steps, said frame having adjacent to the ends of said rails, feet adapted to rest upon the ground.

2. A ladder, comprising a frame having members angularly disposed relative to one another, and rails connecting said members and provided with pivoted steps, said frame having near the ends of said rails, handles wherewith said frame can be manipulated, and feet adapted to rest upon the ground.

3. A ladder, comprising a frame having members angularly disposed relative to one another, supporting wheels secured to said members near their junctions, and rails connecting said members and provided with pivoted steps, said rails having at both ends feet adapted to rest upon the ground.

4. A ladder, comprising a frame having members pivotally connected, and angularly disposed relative to one another, said members being of unequal length, rails connecting said members and each removably secured at one end to one of said members, and steps carried by said rails and pivotally mounted to assume a plurality of operative positions.

5. A ladder, comprising a frame having members pivotally connected, and angularly disposed relative to one another, said members being of unequal length, rails connecting said members and each removably secured at one end to one of said members, steps carried by said rails, supporting means secured to said members near their junctions, said rails having at the ends feet adapted to rest upon the ground, said steps being movably mounted, and brackets mounted upon said rails and adapted to hold said steps in a plurality of positions.

6. A ladder, comprising a frame having members angularly disposed relative to one another and terminating in handles, rails connecting said members and having feet adapted to rest upon the ground, said members having supporting wheels near their junctions, and steps carried by said rails and pivotally mounted to assume a plurality of operative positions.

7. A ladder, comprising a frame having members angularly disposed relative to one another and pivotally connected, an axle journaled upon said frame at the junction of said members, supporting wheels carried by said axle, rails connecting said members and having feet adapted to rest upon the ground, and pivoted steps mounted between said rails, said members terminating in handles, one of said members being removably secured to said rails, the others of said members being pivotally connected with said rails.

8. A ladder, comprising a frame having members angularly disposed relative to one another and terminating in handles, an axle carried by said frames at the junction of said members, wheels mounted upon said axle, rails removably connected with certain of said members, legs carried by said rails at the ends remote from said certain members, means pivotally connecting said legs and said other members, said legs terminating in feet adapted to rest upon the ground, said rails at the ends remote from said legs terminating in feet adapted to rest upon the ground, and steps mounted between said

rails and pivotally movable into different operative positions.

9. In a ladder, rails, brackets carried by said rails, and steps pivoted upon said
5 brackets, said brackets having stops adapted to support said steps in a plurality of positions.

10. In a ladder, rails, brackets carried by said rails and having bearings, and steps,
10 each having at each end fixtures provided with trunnions journaled in said bearings, said brackets having stops adapted to support said steps in a plurality of positions.

11. In a ladder, rails, brackets carried by
15 said rails and having bearings, and steps, each having at each end fixtures provided

with trunnions journaled in said bearings, said brackets having at both sides of their bearings, angularly disposed parts each carrying a stop adapted to engage one of said
20 steps to support the same in position, whereby said steps can be held in a plurality of positions, said fixtures having pairs of lugs for holding the steps therebetween.

In testimony whereof I have signed my
25 name to this specification in the presence of two subscribing witnesses.

HARRY A. SAGER.

Witnesses:

WALLACE P. SMITH,

WALTER B. BUTLER.