Aug. 1, 1944. J. O. YOUNG 2,354,904

ORCHARD LADDER

Filed Sept. 10, 1943 3 Sheets-Sheet 1

FIG. 1.

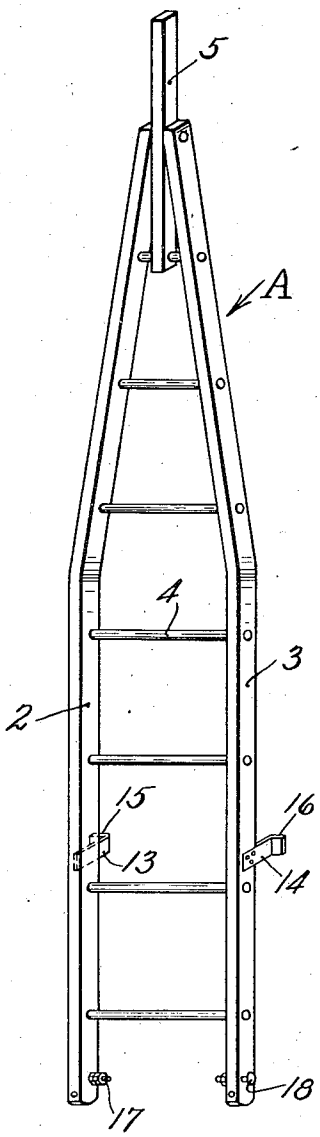
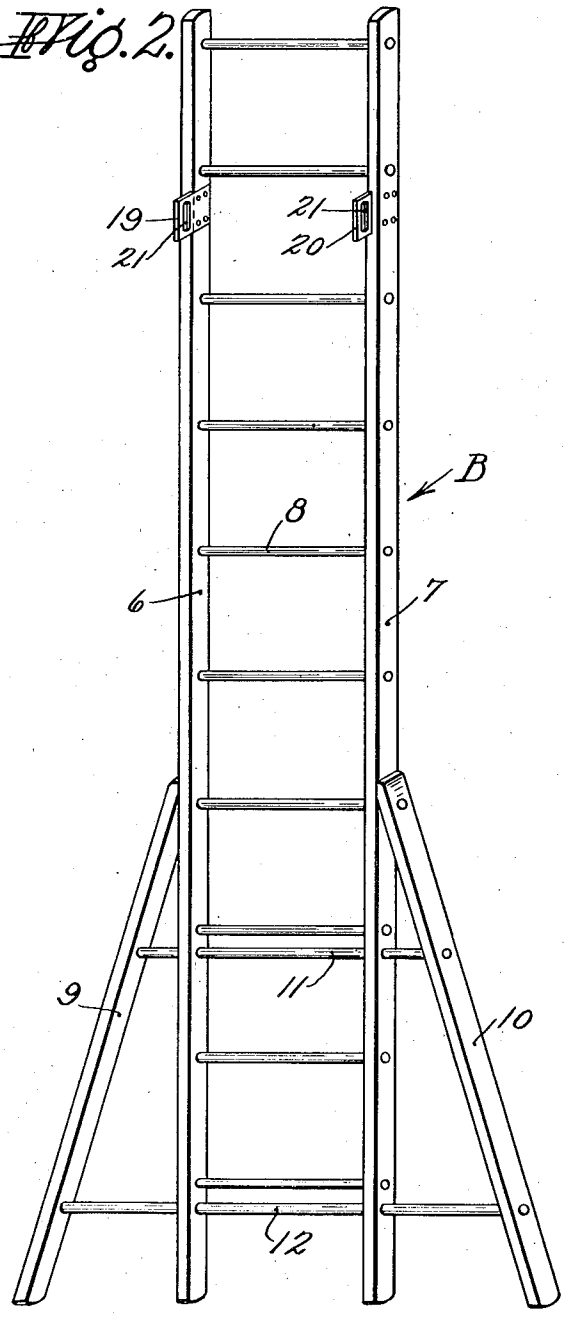


FIG. 2.



INVENTOR
JUDSON O. YOUNG
BY Clapin & Neal
ATTORNEYS

Aug. 1, 1944. J. O. YOUNG 2,354,904

ORCHARD LADDER

Filed Sept. 10, 1943 3 Sheets-Sheet 2

Fig. 3.

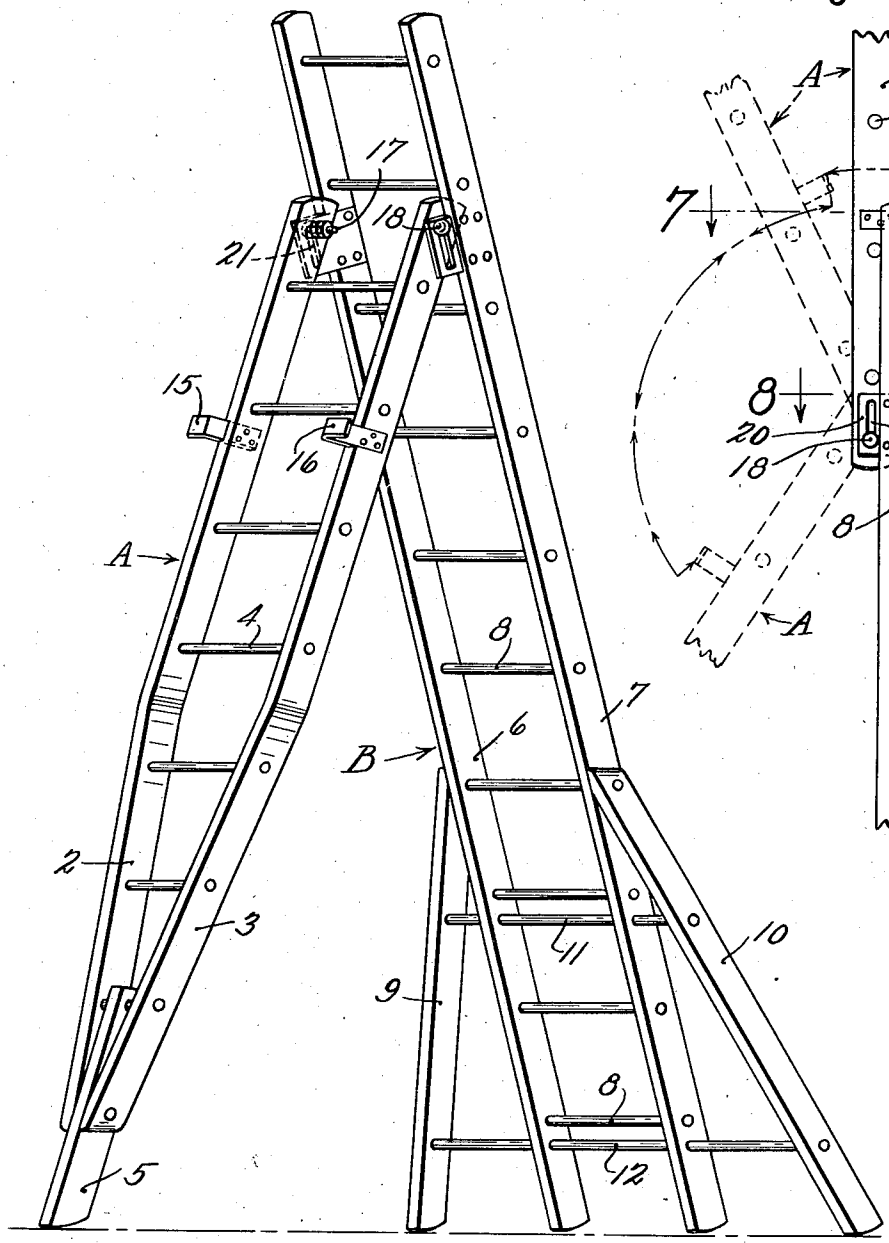


Fig. 4.

INVENTOR
JUDSON O. YOUNG
BY
Chapin & Neal
ATTORNEYS

Aug. 1, 1944. J. O. YOUNG 2,354,904

ORCHARD LADDER

Filed Sept. 10, 1943 3 Sheets-Sheet 3

Fig. 5.

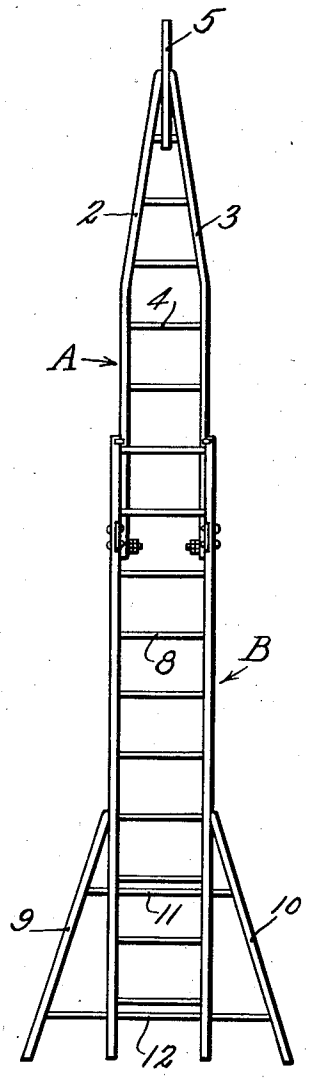


Fig. 6.

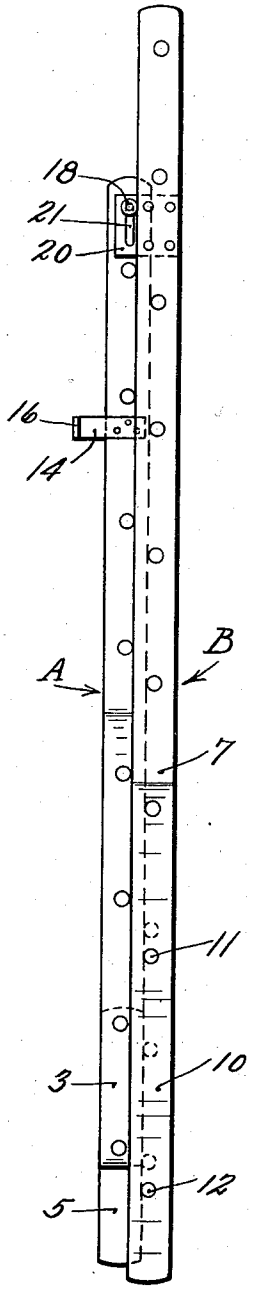


Fig. 7.

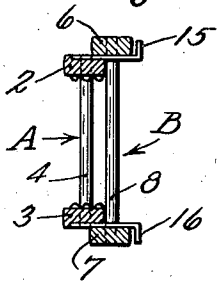
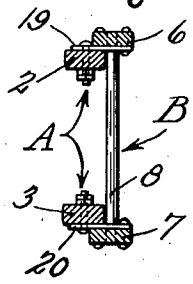


Fig. 8.



INVENTOR
JUDSON O. YOUNG
BY Chapin & Neal
ATTORNEYS

Patented Aug. 1, 1944

2,354,904

UNITED STATES PATENT OFFICE

2,354,904

ORCHARD LADDER

Judson O. Young, North Wilbraham, Mass., assignor to J. O. Young Incorporated, Springfield, Mass., a corporation of Massachusetts

Application September 10, 1943, Serial No. 501,814

2 Claims. (Cl. 228—23)

This invention relates to an orchard ladder used for picking fruit and trimming trees. According to one feature of the invention the ladder is adjustable to the form of a step ladder or to the form of a straight ladder, and by simpler and better means than prior art ladders. Another feature of the invention is in the means by which the ladder is made safer than prior art constructions. Features relating to balance, weight, and rigidity of the ladder, in its adjustable form, are provided in the new construction. These and other features will appear from the drawings and description of one embodiment of the invention.

In the drawings,

Fig. 1 is a view of one ladder section;

Fig. 2 is a view of another ladder section;

Fig. 3 shows the two ladder sections fastened together in position for use as a step ladder;

Fig. 4 is a diagrammatic detail view;

Fig. 5 shows the two ladder sections arranged as a straight ladder;

Fig. 6 shows the two ladder sections nested together;

Figs. 7 and 8 are cross views on lines 7—7 and 8—8 of Fig. 4.

Referring to the ladder section of Fig. 1, it consists in side rails 2, 3, rungs 4, and leg 5 in the general arrangement shown. This section by itself is much the same as one regular type of ladder, except for additions referred to later on. This one will be referred to as the small section or section A. The ladder section of Fig. 2 consists of side rails 6, 7, rungs 8, making another regular type of ladder but with the addition of diverging legs 9 and 10 and rungs 11 and 12 arranged and fastened as shown and also other parts. This one will be referred to as the large section or section B.

The two ladder sections carry cooperating parts shown in Figs. 1 and 2. Their purpose is to hold the sections together as a long straight ladder or a shorter one arranged in the form of a step ladder.

The small ladder section of Fig. 1, except for some additional parts is a customary form of ladder. It is one such as is used against trees. The leg 5 can be put in a tree crotch for good support. The tapered upper portion leading to leg 5 makes it very easy to handle and place between tree branches and the trunk in crotches next the tree. To such a ladder construction I have added the stiff metal plates 13 and 14 firmly fastened on side rails 2 and 3. The plates are turned outwardly at their ends into stiff flanges 15 and 16. These are mounted on the same level and substantially spaced from the adjacent ends of the side rails. Close to such adjacent ends I provide headed bolts 17 and 18 at the same level. The heads of these bolts are spaced outwardly from the adjacent side rails. Their inner ends are held by the locks indicated. From these parts 13 to 18, it is seen what additional parts are added to the small ladder section which may otherwise be of usual ladder construction.

The large ladder section of Fig. 2, is of regular ladder construction to which additions have been made as before stated. The parts 19 and 20 are firmly fastened as by rivets. Each consists in a flat plate of stiff metal having a slot with closed ends. These slots 21 are to receive and guide the bolts 17 and 18 of the small ladder section.

Fig. 3 shows the two ladder sections fastened together and set up in the form of a step ladder. In this form the side rails of the small section fit between the side rails of the large section for nesting, and may be swung out to any appropriate angle for use of the two sections in step ladder form. Bolts 17 and 18 engage slots 21 providing pivots by bearings at the upper ends of the slots. The bolt heads overlie the edges of the slots while the lock nuts and the thickness of the plates determine the amount of play in such fittings. I provide for enough play so that there is an easy sliding fit between the bolts and the slotted metal plates.

Fig. 4 shows in diagram the movements of the ladder sections as they are changed from the step ladder form of Fig. 3 to the straight ladder form of Fig. 5. The movements are accomplished by hand control and the parts are adapted for semi-automatic action to which I will refer later on. From Fig. 4 it will be clear that side rails 2 and 3 may move pivotally with bolts 17 and 18 bearing at the upper ends of slots 21. Such movement is indicated by arrows and successive dotted line positions of section A. When it swings up with relation to section B, the flanges 15 and 16 clear the top end of section B. Then with sections A and B parallel, section A is in position to drop slightly, the length of slots 21, and bolts 17 and 18 rest against the bottom of these slots. In the movement of dropping to the full line position of Fig. 4, section A carries its flanges 15 and 16 in position to engage the side rails 6 and 7 of section B on the edges opposite to the bolts 17 and 18 and their engagement with slots 21. These positions of the parts prevent any folding movements of sections A and B and give the straight ladder form of Fig. 5.

The step ladder form of Fig. 3 and the straight ladder form of Fig. 5 are the two forms for ladder use. Fig. 6 shows the storage and the most convenient form for carrying the ladder. This storage form is accomplished by swinging sections A and B into parallel nested position as from Fig. 3 to Fig. 6.

To adjust the sections from the straight ladder form of Fig. 5 to step ladder form of Fig. 3,

section A is shifted upwardly until flanges 15 and 16 are beyond the ends of section B. The bolts 17 and 18 are then against the upper ends of slots 21 and section A may be turned as on pivots to the form of Fig. 3. This movement is indicated in dotted line positions and the arrows of Fig. 4. It is the reverse of the movements before described in adjusting to straight ladder form.

By providing the combination of parts disclosed an exceptionally convenient orchard ladder is provided. Fig. 6 indicates how nicely the sections A and B may be nested for storage and convenient carrying to and from the orchard. In this respect it is like a straight extension ladder. However, at the tree the improved ladder is adapted for either straight or step ladder use. It is not an extension ladder. Although in straight form it is longer than in step ladder form, the two forms being different, one is not a mere extension of the other. I point out that for the rungs of section B I might provide flat steps as in regular step ladder constructions and important features of my invention would not be changed. But I prefer the ordinary straight ladder construction of section B as shown, because it contributes to my plan of a light weight orchard ladder of exceptional convenience and all around simplicity.

Regarding the manner of using the improved ladder, it is particularly adapted to many different ways of manipulation by the user. Although the ladder may be laid on the ground to start manipulations, that is not necessary. For example, one may carry section A to the left from Fig. 3 position until the sections straighten out. Then by merely elevating the end of section A it and its bolts will slide by weight into position with flanges 15 and 16 back of side rails 6 and 7 and thus into the straight ladder form of Fig. 5. In the operation the user does not have to pay conscious attention to hooking up the sections. The action is semi-automatic. Even a negligent ladder user is protected against forgetting what is necessary to make the ladder safe to use in either of its forms. All he has to do is to get the sections into the step ladder or straight ladder form. If he does either the ladder is in the safe form to use.

As indicated in Fig. 3, there is a three point support on the ground for the step ladder form with the widely spread legs 9, 10 and 5. The side rails 6 and 7 preferably end a little above the side rails of section A. In the straight ladder form of 5 the spread legs 9 and 10, their connecting rungs 11 and 12, and the tapered smaller upper end of section A all help to give a lowered center of gravity or balance line for the whole ladder. The balance line is below the central cross line. This makes the ladder easier to swing into place against a tree and more important easier to swing back and carry. Ordinarily long ladders being top heavy cause accidents by getting out of hand and falling backwardly. I have provided a ladder which is adapted for one man use and particularly for safe use. There are no tricky features in the ladder needing close attention of the user at any time. Even in the hands of an unskilled negligent user the combination is a safe, comparatively light weight, inexpensive, and easily handled composite ladder for step or straight ladder forms.

Having disclosed my invention I claim:

1. A ladder combination for use in orchards either as a step ladder or a longer straight ladder, the combination comprising two straight ladder structures, each of the light weight type having side rails and generally round rungs, one ladder having a pivot supporting plate fastened on a side rail near one of its ends but spaced therefrom a distance of about one or two of the rung spaces, a duplicate plate similarly fastened to the other side rail, said plates having margins extending beyond the edges of the side rails, the margins being provided with closed end slots parallel to the side rails, means providing fixed pivot pins attached to the other ladder, such pins being fastened on its side rails, very close to their ends and extending through the said slots in the pivot supporting plates, so as to provide for a limited relative sliding movement of the ladders, whereby in step ladder arrangement the pins will automatically be at the top of the slots for supporting engagement and in straight ladder arrangement the pins will automatically be at the bottom because of the weight of one ladder on the other, a pair of L shaped plates fastened to the side rails of the ladder carrying the pivot pins, such plates being at a distance from the pins which is slightly less than the distance from the lower ends of said slots to the ends of the side rails on the other ladder, said L shaped plates being positioned for swinging over the ends of the side rails of such other ladder when the pivot pins are at the top of their slots and to move down by gravity for hook engagement with such side rails to prevent pivotal movement in the position occupied when the pivot pins are at the bottom of said slots, all for the purpose described.

2. A ladder combination for use in orchards either as a step ladder or a longer straight ladder, the combination comprising two straight ladder structures, each of the light weight type having side rails and generally round rungs, one ladder having a pivot supporting plate fastened on a side rail near one of its ends, a duplicate plate similarly fastened to the other side rail, said plates having margins extending beyond the edges of the side rails, the margins being provided with closed end slots parallel to the side rails, means providing fixed pivot pins attached to the other ladder, such pins being fastened on its side rails, very close to their ends and extending through the said slots in the pivot supporting plates, so as to provide for a limited relative sliding movement of the ladders, whereby in step ladder arrangement the pins will automatically be at the top of the slots for supporting engagement and in straight ladder arrangement the pins will automatically be at the bottom because of the weight of one ladder on the other, a pair of L shaped plates fastened to the side rails of the ladder carrying the pivot pins, such plates being at a distance from the pins which is slightly less than the distance from the lower ends of said slots to the ends of the side rails on the other ladder, said L shaped plates being positioned for swinging over the ends of the side rails of such other ladder when the pivot pins are at the top of their slots and to move down by gravity for hook engagement with such side rails to prevent pivotal movement in the position occupied when the pivot pins are at the bottom of said slots, all for the purpose described.

JUDSON O. YOUNG.