

No. 772,447.

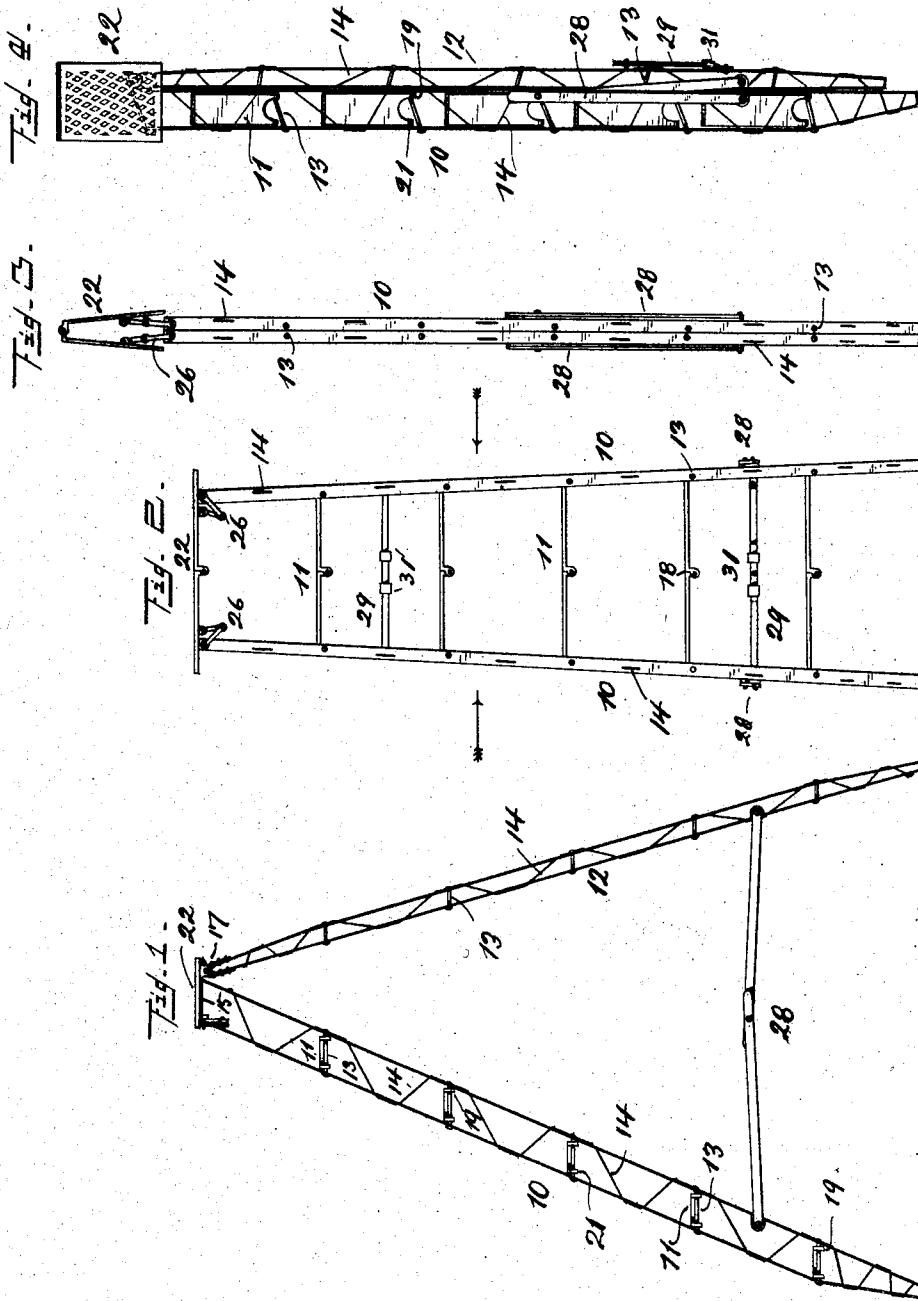
PATENTED OCT. 18, 1904.

C. WHEELWRIGHT.
COLLAPSIBLE STEP LADDER.

APPLICATION FILED JAN. 21, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses
Albert H. Cook
Arthur Kline

Inventor
Charles Wheelwright
by C. Spengel atty

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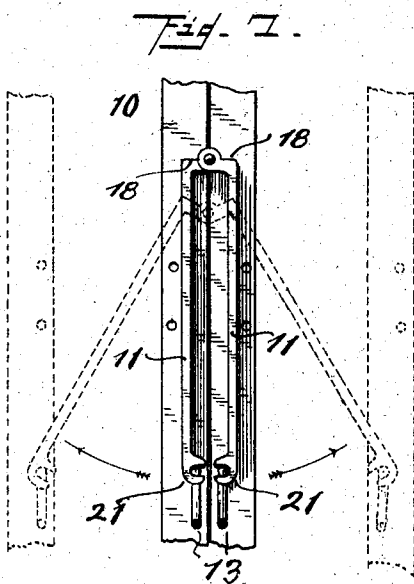
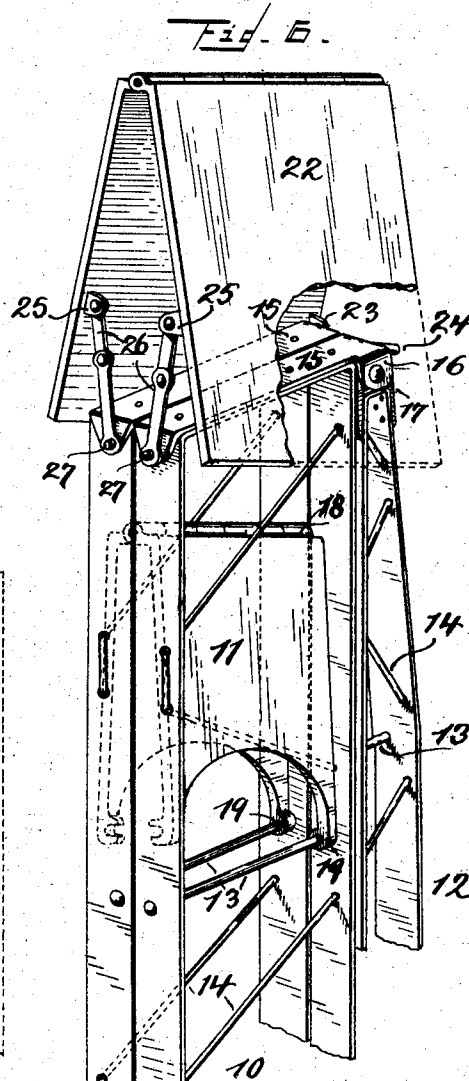
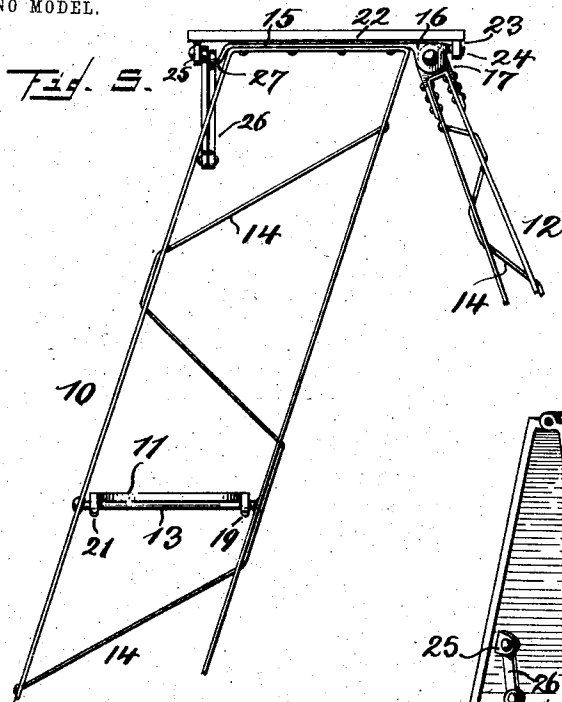
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Witnesses
Albert G. Brock,
Arthur Klum

Invented
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UNITED STATES PATENT OFFICE.

CHARLES WHEELWRIGHT, OF CINCINNATI, OHIO.

COLLAPSIBLE STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 772,447, dated October 18, 1904.

Application filed January 21, 1904. Serial No. 189,941. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WHEELWRIGHT, a citizen of the United States, residing at the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Collapsible Step-Ladders; and I do declare the following to be a clear, full, and exact description thereof, attention being called to the accompanying two sheets of drawings, with the reference characters marked thereon, which form also a part of this specification.

This invention relates to improvements in step-ladders, and comprises two features, one being a certain construction, as hereinafter described and whereby the implement is rendered collapsible transversely, so that when closed up its bulk may be still further reduced. The other relates to the selection of the material, which is metal, but arranged and assembled with a view to render the device as light as possible and compatible with stability.

In the following specification, and particularly pointed out in the claims following, is found a full description of the invention, together with its manner of use, parts, and construction, which latter is also illustrated in the accompanying two sheets of drawings, in which—

Figure 1 is a side view of a step-ladder constructed in conformity with my invention, the same being shown opened ready for use. Fig. 2 is a front view of the same. Fig. 3, in a similar view, shows the ladder collapsed transversely, the same having supposedly been closed first and folded up from the position shown in Fig. 1, so as to be in a position as shown in Fig. 4, which is a side view of Fig. 3. Fig. 5 is an enlarged detail view of the upper part of Fig. 1. Fig. 6 is an enlarged detail view showing the upper part of Fig. 4 in perspective. Fig. 7 is an enlarged detail view and shows part of a front view of the ladder and front edge of a step when closed up.

As to the general construction the ladder consists of the upright members, bars, or stiles 10, which support the steps 11 between them, and the usual props 12, hingedly secured at their upper ends, which serve to maintain the ladder in upright position when in use and as

shown in Figs. 1, 2, and 5. To attain rigidity combined with lightness, the stiles are formed of flat iron bars, preferably hoop-iron, and consist of two parts substantially parallel and held apart by pins 13. They are held together each by a continuous piece of wire 14 passing alternately through holes from one member to the other, as shown. The ends of these wires are secured in any manner by riveting or soldering to prevent them from slipping through the holes through which they pass. The props are constructed in a similar manner, whereby a light but rigid and firmly-braced structure is attained. To the upper ends of the stiles there is riveted a plate 15, which at its rear end has lugs 16, forming the complementary members of the hinges, by which props 12 are connected to these stiles, the other member of these hinges consisting of a block 17, riveted to the upper ends of the props. The steps consist each of two sections hinged together midway between their ends to permit collapse. Each section at its inner hinged end is provided with a shoulder 18, which shoulders by bearing against each other lessen the strain on the hinges when the steps are opened out and subjected to weight. At their outer ends and rear edges each of these step-sections has a perforated lug 19, by which these sections are hingedly secured to the brace-pins 13, there being such a pin for each section in each of the side bars. At the front edge each section has an open or fork-shaped lug 21, which when the parts are in position straddles pins 13. These lugs are open to permit the front part of the steps to leave pins 13 when the ladder is collapsed, as best shown in Figs. 4, 6, and 7, this part of the steps necessarily rising with reference to the pins. The top step 22 as to its rear edge is held in a similar manner, each of its sections having a lug 23, which receives a pivot-pin 24, projecting from plates 15. The front edges have similar lugs 25 and are held collapsibly in position by links 26, connected to each other and one at its free end to these lugs 25 and the other to a pivot-pin 27, one projecting from the front end of each plate 15. The steps may be of wood, in which case their hinged members and attaching parts would

be of metal and connected to the wooden part, or they may be entirely of metal, in which case all these attaching members may form a part of such steps. When so constructed of metal, they may be of open-work, as shown in Fig. 4, to reduce weight.

Outside of the collapsible feature the manipulation of this step-ladder for using is the same as any other. Ladder and props are swung apart from each other and into a position as shown in Figs. 1 and 5. Links 28, connected to each of these members, limit their movement and prevent them from sliding apart and beyond their intended position. After use these members are closed up in the usual manner and as shown in Fig. 4. From this position the ladder may be still further reduced in bulk by collapsing it transversely—that is, by moving the stiles 10 toward each other, as shown by the arrows in Fig. 2, and into a position shown in Figs. 3, 4, 6, and 7, the sectional steps, hingedly secured, readily permitting such movement. There are also transverse braces 29, hingedly secured and provided with sliding locking-loops 31, which engage the inner overlapping ends of these braces and hold the ladder open against collapse transversely. The implement may also be manufactured and used as a collapsible ladder—that is, without props.

Having described my invention, I claim as new—

1. A collapsible ladder having its uprights formed each of two members, pins supported between these members and sectional steps supported by these pins and pivotally attached to them.

2. A collapsible ladder having its uprights formed each of two members held apart by brace-pins and bound together by wires passing alternately from one member to the other, and sectional steps supported by these brace-pins and hingedly attached to them.

3. A collapsible ladder having upright bars, steps in sections hinged to each other, pins on

the upright ladder-bars on which the steps are supported when the parts are in position, lugs 19 at the rear edges of these steps whereby they are permanently hinged to these pins and open lugs 21 at their front edges which temporarily engage with these pins.

4. A collapsible step-ladder consisting of the upright ladder members and props, plates 15 to which all of them are secured with their upper ends, the connection as to the props being a pivotal one, collapsible steps supported between the upright ladder members, a hinged connection at each of their ends whereby they are attached to these uprights, a collapsible top step pivotally attached at its rear edge to plate 15, and links whereby this step is connected at its front edge to these plates.

5. A ladder having its uprights formed each of two members, braces in form of pins whereby they are held a certain distance apart, wires passing alternately from one member to the other and through perforations in them, to hold these members against the braces, and to each other, and steps supported on these uprights and with their ends between the two members of each upright.

6. A collapsible ladder having steps in sections hinged to each other, upright ladder members having pins upon which these steps are supported when in position for use, and lugs at the outer end of each step-section, one 21 at their front edge and one 19 in the rear, which engage the pins mentioned, to hold the step-sections in position on them, the connection of lugs 19 in the rear being hingedly and a permanent one, while as to lugs 21 in front it is detachable to permit collapse of the ladder.

In testimony whereof I hereunto set my signature in the presence of two witnesses.

CHARLES WHEELWRIGHT.

Witnesses:

J. C. McLEAN,
ANDW. MORRISON.