No. 759,176. PATENTED MAY 3, 1904.

A. HARTZLER.

STEP LADDER.

APPLICATION FILED DEC. 15, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

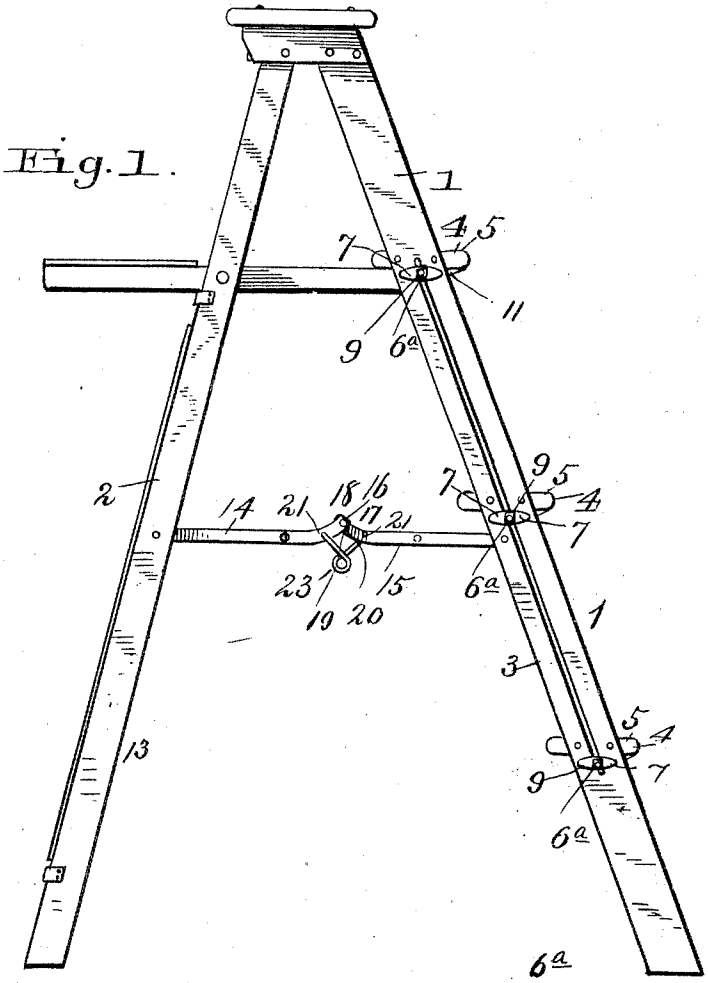
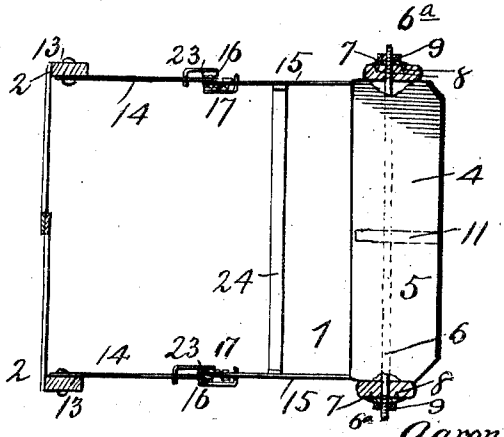


Fig. 4.



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

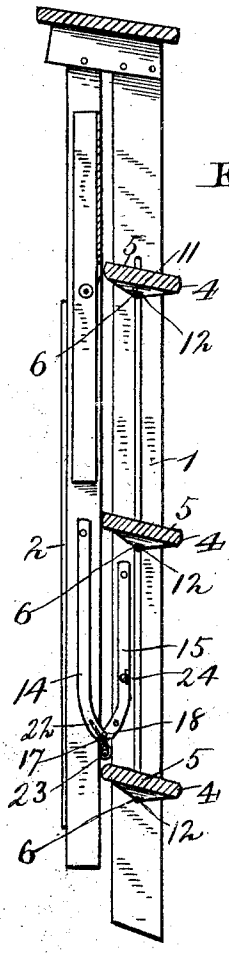


Fig. 7.

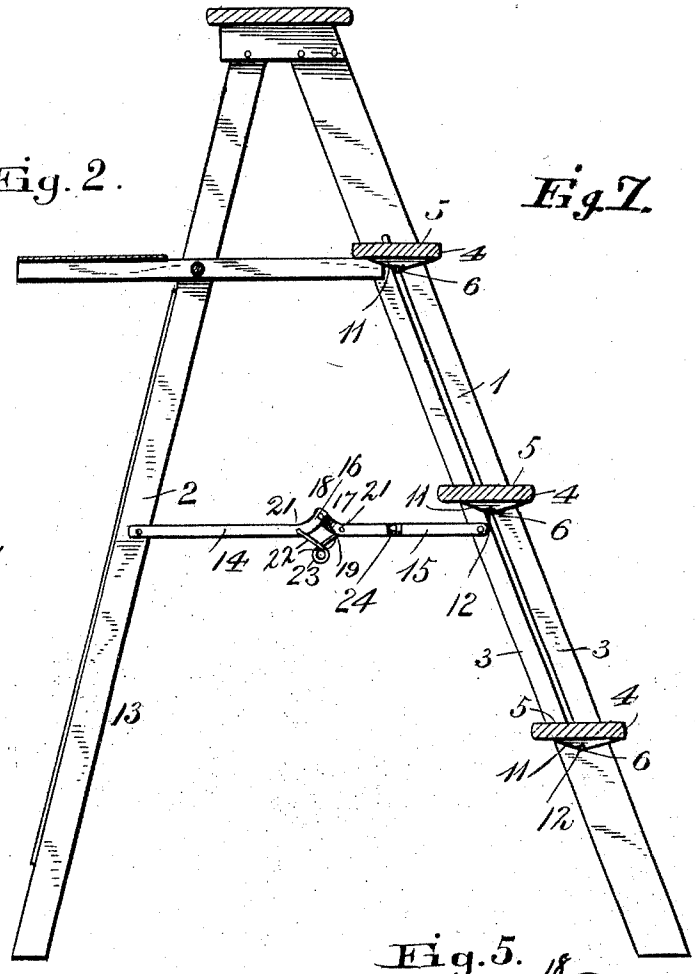


Fig. 3.

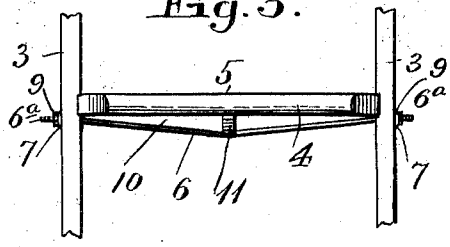
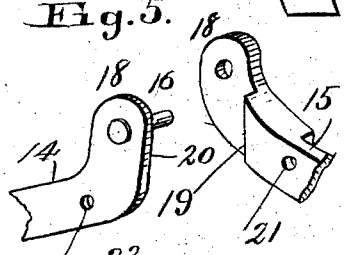


Fig. 5.



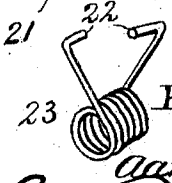


Fig. 6

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No. 759,176. Patented May 3, 1904.

UNITED STATES PATENT OFFICE.

AARON HARTZLER, OF GOSHEN, INDIANA.

STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 759,176, dated May 3, 1904.

Application filed December 15, 1902. Serial No. 135,290. (No model.)

To all whom it may concern:

Be it known that I, AARON HARTZLER, a citizen of the United States, residing at Goshen, in the county of Elkhart and State of Indiana, have invented new and useful Improvements in Step-Ladders, of which the following is a specification.

My invention relates to propped ladders; and the object of the same is to construct a simple and efficient truss-brace for the steps of the ladder and a spring-operated hinge which will hold the ladder locked in its extreme positions and will operate automatically to open the ladder when given a slight initial impetus.

The simple and novel construction employed by me in carrying out my invention is fully described and claimed in this specification, and illustrated in the accompanying drawings, forming a part thereof, in which—

Figure 1 is a side elevation of my ladder set up. Fig. 2 is a longitudinal section of the ladder closed. Fig. 3 is a detail of a fragment of the ladder, showing one step and the truss-rod. Fig. 4 is a plan view of the hinges and cross-bar. Fig. 5 is a detail perspective of one of the hinges, the parts being separated. Fig. 6 is a perspective view of the spring. Fig. 7 is a sectional view of the ladder open.

My ladder comprises a step-bearing section 1, hinged to a prop-section 2 at the upper end in the usual and ordinary manner. The step-section 1 comprises slightly-diverging slotted side bars 3, connected by steps 4, the treads 5 of which project slightly beyond the front edges of the side bars 3. Truss-rods 6 are employed to brace or prevent the spreading of the lateral bars 3, each rod being bowed or deflected downward, having preferably the greatest depression or vertex 10 about at its mid-length. The end portions of each brace or rod pass through said lateral bars, and each projects or extends a suitable distance beyond each lateral bar, the extensions thus formed being screw-threaded, as at 6^a, and provided outside of the latter with elongated washers 7, having teats or pins 8, and with nuts 9. Said pins or teats are embedded into the lateral bars, sufficient pressure or force being applied to said washers for that purpose to prevent the turning or displacement of the latter. Further reference will be had to said screw-threaded extensions and nuts presently. A bracing or truss block 11 is inserted or interposed between each step and truss-rod or brace 6, with its lower edge resting in the vertex or angle 10 of the latter and its upper edge bearing centrally of and upon the under side of the former, said upper edge extending entirely across the under surface of said step to effectively brace the same, especially at its projecting forward edge, thus lessening the liability of the splitting of the same at that point in use.

It is noted that when the parts shrink or become loose, as they will after a certain length of time and use, as is well understood, by screwing up or tightening the nuts upon the truss-rods this looseness may be compensated quickly and effectively.

The prop-section 2 has two legs 13, and pivoted to said legs are two arms 14, which in combination with two arms 15, pivoted to the side bars 3 and to the arms 14 on a pintle 16, form two hinges 17. The arms 14 and 15 are bent upwardly at 18 adjacent to the pintle 16, and the arms 15 have square shoulders 19 formed thereon, which are located in position to engage plane faces 20, formed on the sides of the upturned ends of the arms 14 when the hinges are straightened out—that is, when the arms 14 and 15 are extending oppositely and in alinement with each other.

An aperture 21 traverses each of the arms 14 and 15 adjacent to the bend 18 to accommodate pintles 22, formed by bending the extremes of two stiff coiled springs 23, which are mounted beneath the hinges. A cross-bar 24 spans the interval between the arms 14 and has its extremes bent at right angles and rigidly secured to the arms 14.

Suppose the ladder set up as in Fig. 1. The hinges 17 are then straightened out. The shoulders 19 are in contact with the plane faces 20, and since the pintle 16 is above the line joining the pintles 22 the springs 23 tend to hold the shoulders 19 in contact with the faces 20. The pintle 16 is also above the line of direction of the bodies of the arms 14 and 15. Therefore the hinges 17 are locked. When it is de-

sired to move the ladder, the cross-bar 24 is grasped and forced down until the pintle 16 passes below the line joining the pintles 22, when the springs 23 will operate the hinge to close the ladder. The movement of closing may be assisted by bearing on one of the sections 1 or 2, which is raised clear of the ground, while the other rests thereon. When the ladder is completely closed, the pintle 16 is still past the dead-center, and the springs will tend to force the arms 15 and 16 into a position parallel to each other, and thereby hold the sections 1 and 2 together, so that the ladder may be packed around by grasping either of the sections 1 or 2 without danger of the other section flapping.

I do not wish to be limited as to details of construction, as these may be modified in many particulars without departing from the spirit of my invention.

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

1. In a propped ladder, the combination of a step-section a prop-section hinged to said step-section, a hinge having one of its arms pivoted to said step-section and the other to said prop-section, said arms being bent upwardly adjacent to said hinge and bearing stops to limit the upward movement of said hinge, and a stiff coiled spring mounted below said hinge and having its extremes attached to said arms on opposite sides of said hinge, whereby said hinge is held straightened out when said ladder is spread and said hinge is held folded when said ladder is closed and the ladder held against flapping when being carried about, substantially as described.

2. In a propped ladder, the combination of a step-section a prop-section hinged to said step-section, two hinges each having one of their arms pivoted to one of the side bars of said step-section and the other arm pivoted to one of the legs of said prop-section, springs mounted to actuate each of said hinges, and a cross-bar connecting said hinges to enable them to be operated in unison, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

AARON HARTZLER.

Witnesses:
AARON S. ZOOK,
OSCAR JAY.