E. P. PALMER.

LADDER.

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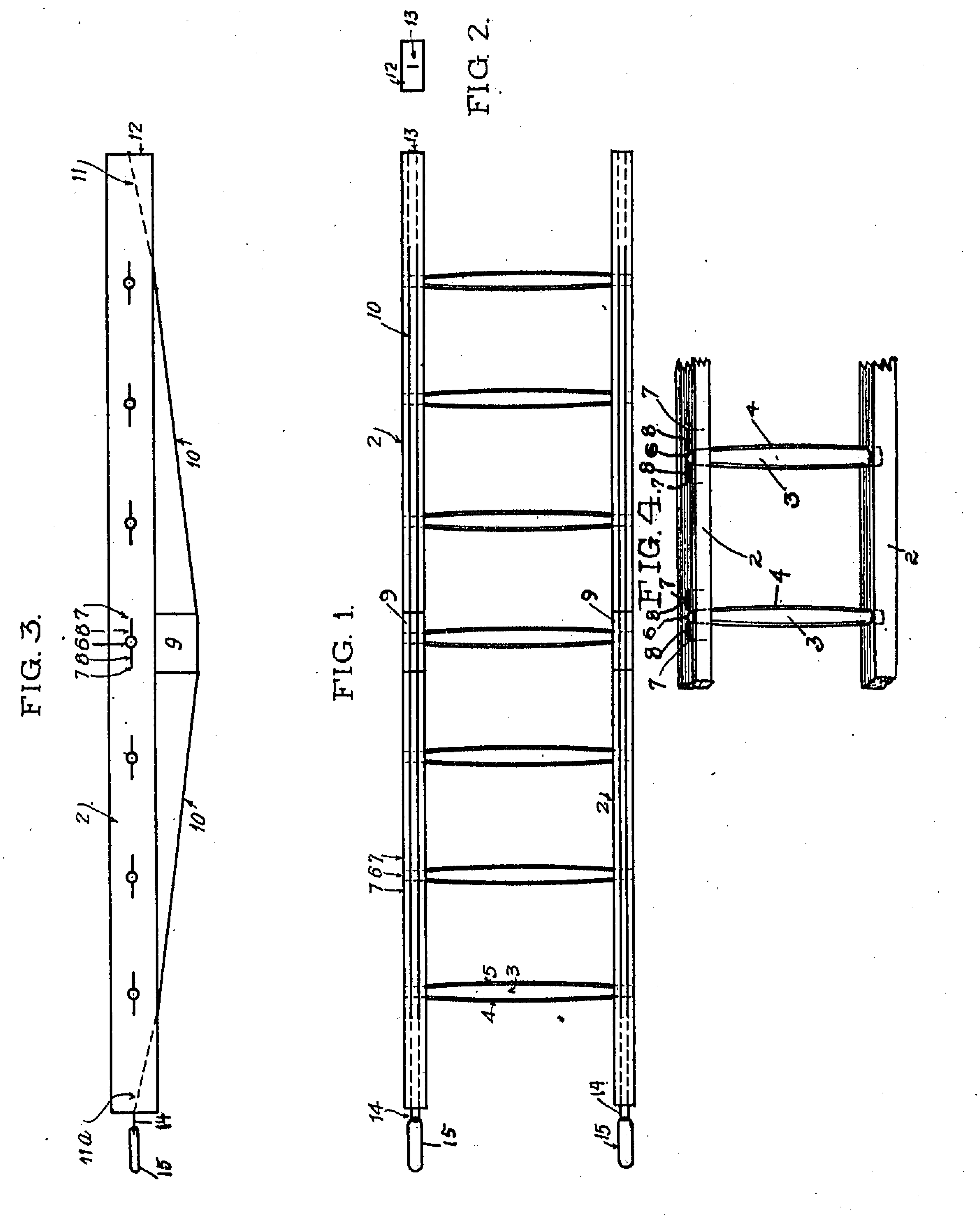
993,867. Patented May 30, 1911.



WITNESSES

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EDWARD PEARCE PALMER, OF ZACATECAS, MEXICO.

LADDER.

993,867. Specification of Letters Patent. **Patented May 30, 1911.**

Application filed July 28, 1910. Serial No. 574,360.

To all whom it may concern:

Be it known that I, EDWARD PEARCE PALMER, a subject of the King of England, residing at the city of Zacatecas, Mexico, have invented certain new and useful Improvements in Ladders, of which the following is a specification.

My invention purposes to provide simple and inexpensive means for strengthening in the direction of their length ladders of all kinds, more especially very long ladders. These means may be advantageously applied to ladders made and in use, as well as in the construction of new ones. By use of these structural additions to the common ladder the danger of its breaking at mid-height when the load reaches near that point is practically eliminated. Besides they offer the advantage of rendering fit for continued use ladders that have become untrustworthy through long use and exposure to the weather.

The invention also provides a simple device for strengthening the ladder transversely, guarding against the ends of the rungs leaving their sockets by the spreading apart of the sides, said device also diminishing the wear on the rungs.

Another object of the invention is to equip the top of the ladder with rings or eyes that will afford ready means for securing the top against slipping sidewise. These may be independent of the strengthening means or connected therewith, this latter form being preferred.

In the accompanying drawing: Figure 1 is a bottom plan view of a ladder equipped with the devices forming the subject of this invention; Fig. 2, an end view of the face of the foot of one of the sides; Fig. 3, a side elevation of the strengthened ladder, and Fig. 4 is a perspective view of a section of the ladder showing the cross wires.

In the ladder, otherwise of usual construction, the sides 2, 2, are braced to each other, and the rungs 3 strengthened by stringing short lengths of strong wire 4 across between the sides, along the top of the rungs, and similar lengths 5 along the bottom of the rung. These wires are rove through holes 6 in the sides of the ladder, drawn very tight and secured in place by being driven into other holes 7 a short distance above or below their hole 6, and preferably smaller in diameter than the cross-wire. The portion 8 between holes 6 and 7 is hammered close into the side. Any other suitable method of securing the ends of the cross-wires may be used. I prefer the one here shown as being simple and self-contained.

From the rear of each ladder-side a strut 9 projects rearward at right angles. This serves to hold back from the sides of the ladder the wire tension members of the king-post truss of which it forms the compression member. I am aware that the king-post truss has long been known, but I am not aware that it has ever been applied to ladders. Furthermore I have here designed an effective and very inexpensive method of constructing the truss, which is easily applied to ladders already in use. This consists in using as the tension member for each truss a wire 10, bent double by being rove through holes or conduits 11, drilled on a slant from the middle of the face 12 of the foot of the side member to the rear side of said member. The holes follow the angle made by a straight line from the middle of said foot to the outer or rearmost point of strut 9. Upon reeving wires 10 through these holes and drawing them forward or upward the bight 13 takes against the face of the foot, as shown in Fig. 2, the wires being pulled through the conduits until the two parts are just equal.

At the upper end of the ladder the two wires are passed through inclined conduits 11^a, similar to those at the foot. After coming out at the middle of the top end of the side member the ends of the two wires are bent to form a staple shaped eye 14, into which I prefer to link the eye 15, movable in 14. Eye 15 is adapted to engage any hook or bolt projecting from the side of the surface against which the top of the ladder is rested, thereby holding the same in place against slipping laterally.

For very long ladders wire rope is substituted for plain wire.

Having thus fully described my invention I claim:

1. In a ladder a strengthening truss consisting of the known king-post truss, the strut projecting rearward from the middle of the rear side of each side-member and at right angles thereto, the tension member for each side-member of the ladder consisting of a single wire rove through two conduits

passing from the middle of the face of the foot of the side-member obliquely downward and out at the rear of said side-member, the two parts of said wire being made equal, the bight bearing against the foot of said side-member, the upper end of side-member being provided with conduits similar to those at the foot but sloping in the opposite direction, the two ends of said wire rove through said conduits and united after passing through the face of the head of said side-member, being formed into an eye, and a large eye linked into said eye.

2. A ladder comprising a pair of side rails, cross bars, bracing cables, said cables passing through passages formed near the top of said rails and protruding from the top and formed into eyes, and a supporting link secured within each of said eyes.

3. A ladder comprising a pair of side rails, provided with alined apertures, cross bars fitting within said apertures, an upper and lower bracing strip for each of said bars the ends of said strips passed through said apertures, and the protruding ends bent to each side and driven into the side of said side rails.

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

EDWARD PEARCE PALMER.

Witnesses:

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