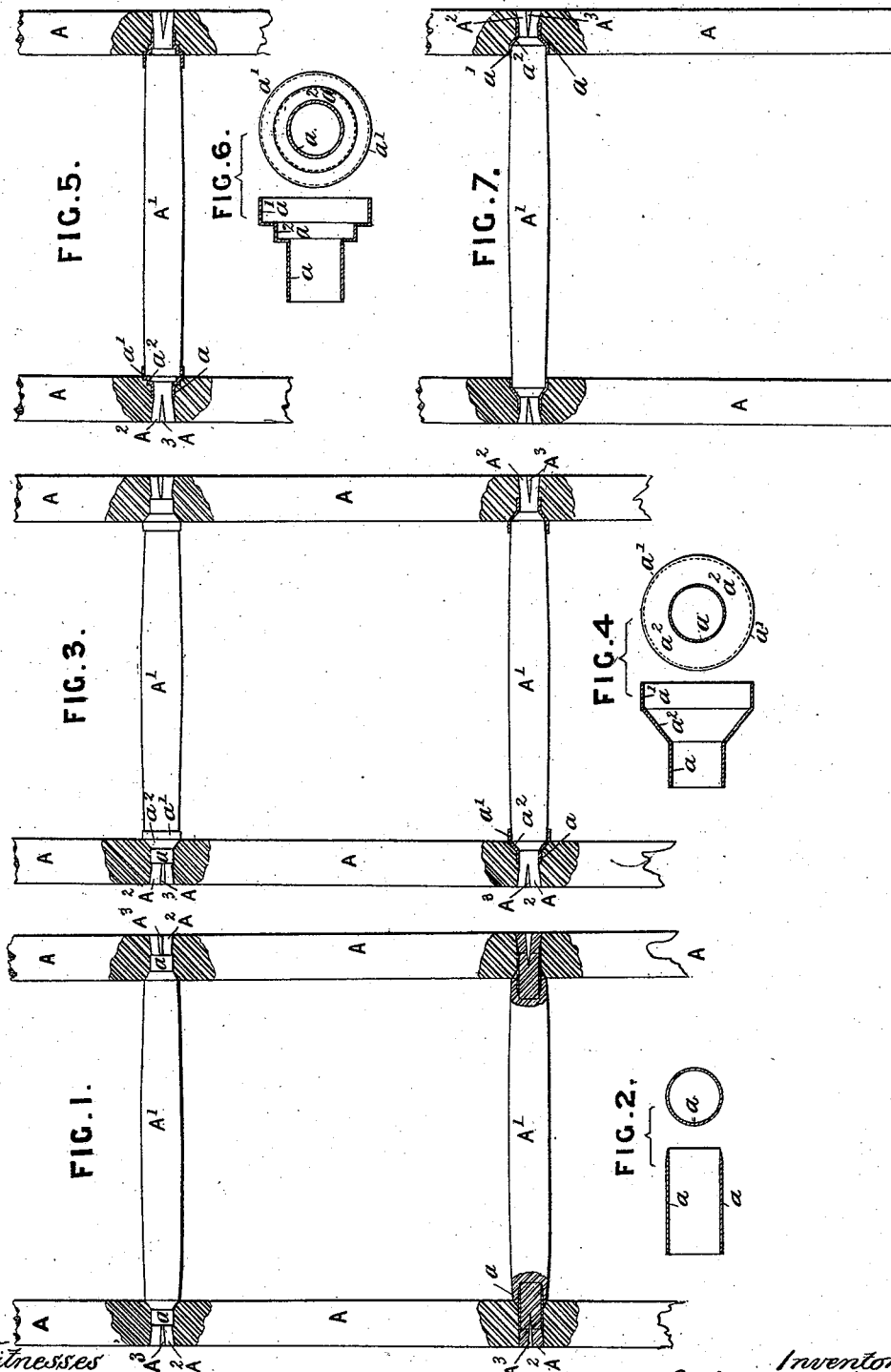


(No Model.)

J. T. KNOX.
WOODEN LADDER.

No. 523,898.

Patented July 31, 1894.



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JOHN T. KNOX, OF GLASGOW, SCOTLAND.

WOODEN LADDER.

SPECIFICATION forming part of Letters Patent No. 523,898, dated July 31, 1894.

Application filed June 5, 1894. Serial No. 513,584. (No model.) Patented in England October 12, 1891, No. 17,361.

To all whom it may concern:

Be it known that I, JOHN TURNBULL KNOX, a subject of the Queen of Great Britain and Ireland, and a resident of Glasgow, Scotland, have invented certain Improvements in and Relating to Wooden Ladders, (for which Letters Patent No. 17,361, dated October 12, 1891, were granted in Great Britain,) of which the following is a specification.

10 This invention has reference to and comprises an improved method and devices to be applied to the transverse foot-tread steps of portable wooden ladders used by workmen for ascending buildings and for like purposes and which will enable such ladders to be made lighter, stronger, and more safe, and durable than as heretofore constructed.

The improvements consist in fitting over the narrow ends of the transverse foot-tread steps of wooden ladders, hollow metallic sleeves which may be in the form of ferrules, tubes, and like coverings, and be made of various shapes and sizes to fit within the transverse holes formed at intervals apart in the two side longitudinal support beams of the ladder, and thus protect these ends from wear, strains, and decay, and make the tread steps more safe and durable.

30 In order to enable others skilled in the art to which my invention relates to understand how it may be carried into practice, I have hereunto appended an explanatory sheet of drawings, representing the application of a few forms of my improved protecting metallic sleeves to the transverse tread-steps of ladders.

40 Figure 1 represents an elevation of the lower part of a wooden ladder broken away, and Fig. 2 shows sectional side and end views of the form of metallic sleeve fitted on the ends of the transverse foot-tread steps shown in Fig. 1. Figs. 3, 4, 5, and 6, respectively are views corresponding to Figs. 1, and 2, but showing modified forms of my foot-tread protecting sleeves. Fig. 7 is a view corresponding to the lower part of Fig. 3.

In Figs. 1, 3, and 5, the upper step A' and

its securing ends A² are shown in plain elevation, and in Fig. 1 the securing ends of the lower step in sectional elevation while the main longitudinal beams A of the ladder are shown in section at these mortise parts to illustrate the application of my improvements more clearly.

Referring to Figs. 1 and 2, in this arrangement the protecting sleeve is shown as a short cylindrical hollow tube *a* which is fitted over each end A² of the transverse tread foot-step spars A', and driven into a narrow annular groove a short distance into the thick part of the wooden steps A' leaving the extreme wooden ends A² uncovered for some distance at their outer ends for being slitted to receive a usual wooden securing wedge key A³ driven into the tongue end A² from the outer edges of the beams A.

In Figs. 3 and 4 the protecting sleeve is formed in one piece of a narrow inner cylindrical part *a* a corresponding outer and larger cylindrical parallel part *a'* and an intermediate cone shaped part *a²* all formed to fit tight onto the ends A² of each step A' and into corresponding bored holes in the beams A. As shown in Fig. 3 the narrow part *a* covers the central narrow part of the end A² of the step A', the part *a²* extends from this on a tapering part to the edge of the beams A, and the outer part *a'* covers an exposed end part of the thick circumference of the tread-step A'.

80 As shown in Fig. 7 the part of the tread step A' covered by the larger end *a'* of the sleeve may extend within the transverse hole formed in the longitudinal beams A; and the large circumference A' of the wood may be similarly inserted with the tube *a* shown in Fig. 1.

In Figs. 5 and 6 the parts *a* *a²* *a'* of the sleeve are made parallel and cylindrical, but of increasing diameter, to cover the ends A² of the steps A' in an equivalent manner to that shown in Fig. 3.

Although I have only shown three forms of metallic protecting sleeves it is to be under-

stood that various polygonal shapes of these
may be used to serve the same purpose.

What I claim is—

5 In wooden ladders, the transverse foot-
tread steps in combination with hollow me-
tallic sleeves fitted on the ends of said steps,
and longitudinal beams with transverse holes
to receive said sleeved ends, substantially as
set forth.

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

JOHN T. KNOX.

Witnesses:

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land.*