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HINGE JOINT FOR FOLDING LADDERS.

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Fig. 1.

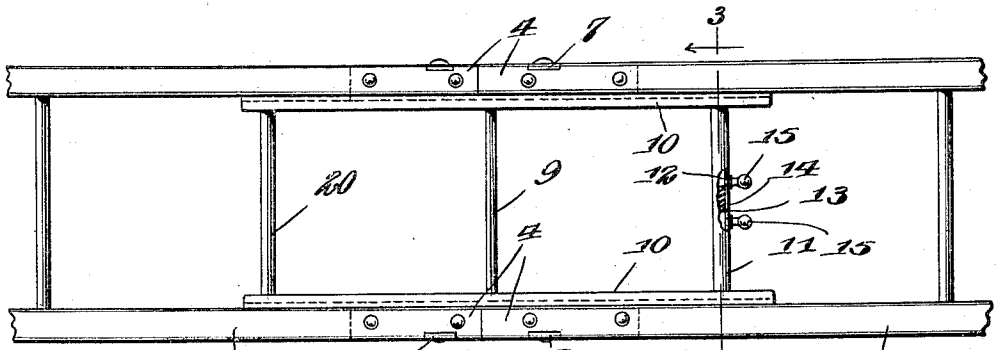


Fig. 2.



Fig. 3.

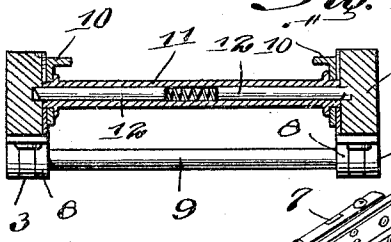


Fig. 4.

Witnesses

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HINGE-JOINT FOR FOLDING LADDERS.

1,228,248. Specification of Letters Patent. **Patented May 29, 1917.**

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To all whom it may concern:

Be it known that I, HARRY H. RUDD, a citizen of the United States, residing at Roanoke, in the county of Roanoke and State of Virginia, have invented new and useful Improvements in Hinge-Joints for Folding Ladders, of which the following is a specification.

This invention relates to ladders and has particular application to a folding ladder.

The chief object of this invention is to provide a device of this character with novel means for hinging the sections thereof and for locking the sections in alinement whereby there will be no interruption to the spacing of the rungs and no lateral projections beyond the outer faces of the stiles.

Another object of this invention is to provide a device of this character which contains the desirable features of simplicity, durability, and efficiency, and furthermore a device which may be manufactured at a nominal cost.

Details of the invention will appear as the specification is read in connection with the accompanying drawings in which:—

Figure 1 is a plan view of the ladder in extended position.

Fig. 2 is a longitudinal section of Fig. 1.

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 1.

Fig. 4 is a perspective view of a portion of the folding ladder, the sections of which are arranged at an angle to each other.

Referring to the drawings in detail, 1 and 2 designate the sections of a folding ladder which are connected by the hinges 3. The hinges 3 are arranged upon the confronting edges of the stiles 4 of the sections and are composed of the leaves 5 and 6, each of which is provided with the outwardly extending brace member 7 which is adapted to be countersunk into the other face of the stile and attached by screws or other securing members whereby the leaves will be held securely upon the sections of the ladder. The confronting ends of the leaves 5 and 6 are provided with ears 8, the ears of one hinge being in alinement with the ears of the remaining hinge and all ears are pivotally connected to each other by means of the transversely extending bolt 9.

It will be seen from the foregoing construction that I have provided means for hingedly connecting the sections of a ladder whereby the sections may be folded against each other to facilitate the transporting of the same, or arranged in alinement to provide a straight ladder as for ascending to a high point or use on a painter's scaffold.

To lock these sections in alinement and to prevent accidental parting or folding of the same, I have provided the section 1 with a pair of parallel spaced extensions 10, the extensions having one of their ends secured to the inner faces of the stiles and projecting beyond the hinged ends of the section as is clearly shown in the drawings. In this instance I have formed the extensions 10 of metal bars which are L-shaped in cross section and which are secured to the inner faces of the stiles of the section 1 so that they will engage the inner faces of the stiles 4 of the section 2 when the sections are in alined position as will be understood, thereby forming a substantial brace for the connection between the sections. The free ends of the extensions 10 are connected by a hollow or cylindrical rung 11, the opposite extremities of which extend through and slightly beyond the extensions 10. Slidably mounted within the rung 11 are latches or bolts 12 of such a length as to normally project beyond the opposite ends of the rung as will be understood. Interposed between the confronting ends of the bolts 12 is a coiled spring 13 serving to normally project the bolts beyond the ends of the rung. To limit the outward movement of the bolts I have provided the rung 11 at its medial portion with an opening 14 preferably on its under side which is adapted to receive operating handles 15 formed on the bolts 12. The operating handles are so disposed as to project at substantially right angles from the bolts 12 thereby engaging the opposite end walls of the openings 14 and thus limiting the outward movement of the bolts 12. It will be understood that the handles 15 may be actuated to retract the bolts as will be hereinafter described.

Formed on the confronting faces of the stiles 4 of the section 2 and in spaced relation to the hinged end of the section 1 are a pair of keeper plates 16 which are preferably L-shaped and of any suitable metal. The keeper plates 16 are each provided with an opening 17 registering with a recess 18 formed in the confronting face of the stile. The plates 16 are further provided

with recesses 19 which are adapted to communicate with the openings 17 as is clearly shown in the drawings. The recesses 18 formed in the stiles of the section 2 are adapted to receive the outer ends of the bolts 12 when the sections of the ladder are in alined positions as is shown in Fig. 1. It will be understood that the walls of the recesses 19 are adapted to form guide ways for directing the bolts 12 into the recesses 18, the opening 17 serving to reinforce the recesses 18 and assist in retaining the bolts within the recesses as will be understood.

It will be seen from the foregoing construction that when the sections 1 and 2 are arranged in alined positions for use in scaffolding or other purposes, the extensions 10 will engage the stiles of the section 2, the bolts 12 extending into the recesses 18, and the springs 13 serving to keep the bolts within the recesses against accidental displacement. By retracting the bolts 12 from the recesses 18, the sections of the ladder may be arranged at an angle or folded one upon the other to facilitate the shipping of the same. It will thus be seen that I have provided means for securely locking the sections in alined or extended positions, and means for readily releasing the locking means to permit the sections to be folded.

To facilitate the scaling of the ladder, the rung 11 may be used, as I have disposed the handles 15 on the under side so as not to interfere with the feet of the person when scaling the ladder. The extensions 10 may be connected at their secured ends by means of a rung 20 so that the series of rungs will not be interrupted when the sections are in alined positions.

It is thought from the foregoing taken in conjunction with the accompanying drawings that the construction and operation of my device will be apparent to those skilled in the art, and it will be obvious that I have avoided the use of any elements which project beyond the outer side faces of the stiles of the ladder, whether it is open or closed, elements which so often catch on adjacent objects when the ladder is being raised or lowered and cause annoyance to the user and accidents on occasions. It will be seen that when the ladder is straight there is no interruption to the spacing of its rungs, and when it is bent as illustrated in Fig. 4 the uppermost members 20, 9, and 11 constitute the three upper rungs and the extensions 10 and uppermost rung 11 reach even beyond the hinge at the apex of the sections, so that on this side of this ladder at least, the user can go clear to the top. I would have it understood that minor changes in the size, shape, proportion and minor details of construction may be made without departing from the spirit and scope of the appended claims.

Having described the invention what is claimed is:—

1. In a hinge joint for folding ladders, the combination with two sections whose stiles meet end to end; of a hinge connecting each pair of meeting stiles and consisting of leaves secured to the lower edges of the stiles, braces extending integrally from the outer edges of said leaves and countersunk into the outer faces of the stiles, ears carried by the leaves, and a single bolt pivotally connecting all ears; extensions secured to the inner faces of the stiles of one section and projecting beyond their upper ends, means for removably latching the projecting ends of said extensions within the other section when the sections are alined, and a rung connecting the secured ends of said extension and spaced to conform to the spacing of the other rungs in the sections, said bolt and said securing means constituting other rungs similarly spaced.

2. In a hinge joint for folding ladders, the combination with two sections, hinges on the lower edges of the meeting ends of the stiles of said sections, and extensions secured to the inner faces of the stiles of the lower ladder section and projecting beyond their upper ends; of a tubular rung uniting the upper ends of said extensions and slotted on its under side, spring-projected latches within said rung having handles moving within said slot, and keepers on the inner faces of the stiles of the remaining ladder section adapted to receive the tips of said latches, for the purpose set forth.

In testimony whereof I affix my signature.

HARRY H. RUDD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."