

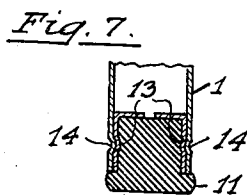
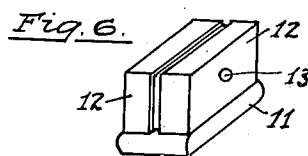
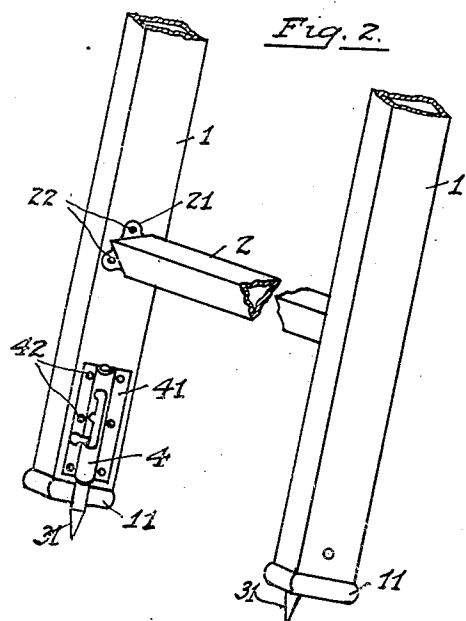
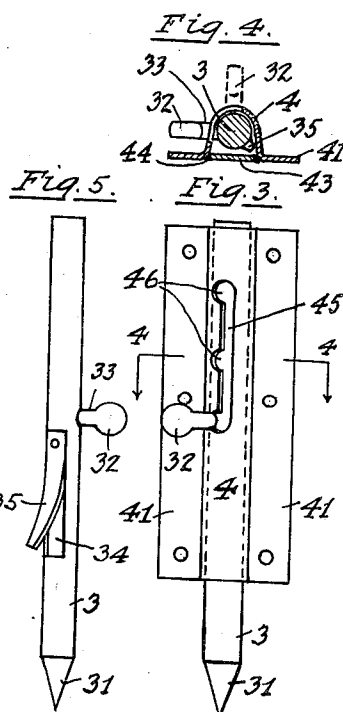
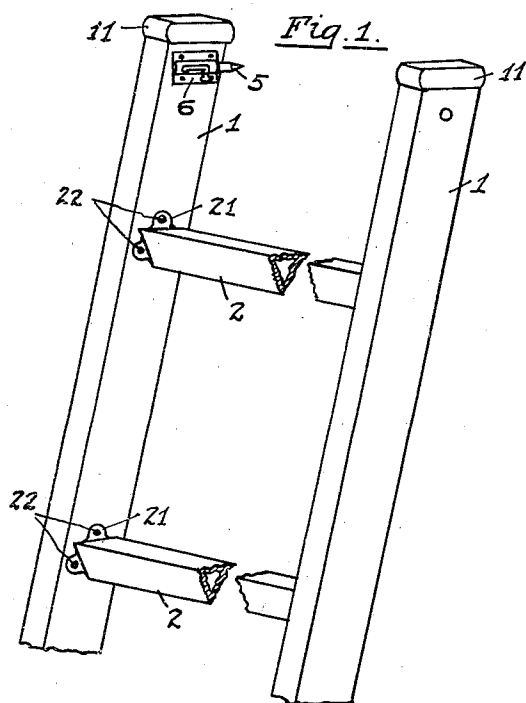
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O. M. KIRLIN

2,127,035

LADDER

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Inventor -
Olis M. Kirlin

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LADDER

Otis M. Kirlin, Detroit, Mich.

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2 Claims. (Cl. 228—61)

My invention relates to portable ladders, and its principal object is to provide a ladder in which the main parts are of tubular metal construction, thereby forming a ladder which is of great strength having regard to its light weight and of such durable construction as to be able to withstand the rough usage to which such articles are subjected.

Another object of my invention is to provide resilient members upon the upper and lower extremities of the ladder, said members being adapted to rest against floors and walls of wood and other smooth materials which are liable to be damaged by ordinary ladders and upon which such ladders are liable to slip.

A further object of my said invention is to provide retractable safety spikes upon the upper and lower ends of the ladder, the said spikes, when in use, being adapted to rest upon rough or uneven surfaces and being adjustable in the amount of their projection so as to level up the ladder and cause it to be firmly supported without vibrating or slipping.

With these and other objects in view, I will now describe a preferred embodiment of my invention with reference to the accompanying drawing, in which—

Figure 1 is a fragmentary perspective view showing the upper end of the ladder.

Figure 2 is a similar view showing the lower end of the same.

Figure 3 is an elevation showing one form of the retractable safety spike together with the housing for supporting the same upon the side rails of the ladder.

Figure 4 is a transverse section on line 4—4 of Figure 3.

Figure 5 is an elevational view of the spike together with the spring by which it is held in the various positions of adjustment.

Figure 6 is a perspective view illustrating the resilient end member together with the metal holders by which it is retained in the ends of the side rails, and

Figure 7 is a transverse section of the same taken upon the center line.

Like characters designate corresponding parts throughout the several views.

1 designates the side rails of hollow rectangular cross section formed from solid-drawn steel tube or from flat plates bent up and welded. 2 are the rungs of triangular tube construction having their ends flanged outwardly to provide lugs 21 which are secured to the opposed inner faces of the rails by bolts or rivets as at 22, or

alternatively by welding. The rungs are positioned with one flat side at the top so as to provide a safer and more comfortable surface for the feet of the user than is the case with round rungs commonly employed.

Upon the ends of the side rails 1 are resilient end members or feet 11. The said members, of rubber or other resilient material, are partially enclosed upon their sides, ends and top surfaces by members 12, of metal or other suitable material, the said members being provided with central depressions 13 adapted to engage similar depressions 14 in the side rails and so retain the respective parts in their assembled positions within the rails as shown in Figures 6 and 7.

Upon the lower ends of the ladder are the spikes 3 which, as shown in detail in Figures 3, 4 and 5, are slidably mounted in housings 4, the said housings being bent up from sheet metal so as to provide flanges 41 by which they are secured to the inner surfaces of the rails by any suitable means such as the screws 42. The spaces for receiving the spikes are closed at the back of the housings by longitudinal plates 43 secured in position by welding as indicated at 44. The spikes 3 are provided with pointed ends 31 and with handles 32 of flat construction connected to the spikes by cylindrical shanks 33 which are secured within holes in the spikes by riveting or other means. In the housings 4 are slots 45 in which the shanks 33 are slidable longitudinally, there being provided a plurality of notches 46 in which the shanks may be received so as to hold the spikes firmly in various positions according to the amount of projection necessary to level up the ladder. Within cavities 34 of the spikes are the curved flat springs 35 which serve to retain the spikes rotatively in the free or slidable positions, as required. In Figure 4, in which the spike is shown in full lines in the locked position, the spring 35 as shown rests in the cavity formed by the side wall of the housing 4 and the back plate 43. When, however, the handle 32 is moved into the position shown in broken lines in Figure 4 so as to remove the shank 33 from its co-acting notch 46, the spring impinges upon the inner surface of the back plate with considerable pressure, so that its accidental movement in this direction is rendered impossible.

At the upper end of the side rails are spikes 5 adjustably held in housings 6, the construction being similar to that described with reference to the spikes 3, with the exception that the spikes 5 are of smaller dimensions and project horizontally instead of downwardly.

It will be observed from the foregoing description and by reference to the drawing that I have provided a ladder of light and simple construction having resilient ends adapted to protect the floors, walls and other supporting surfaces from injury and make slipping of the ladder impossible. It will be seen further that, for conditions where spikes are desirable, I have provided a spike the projection of which may be varied for the purpose of levelling up the ladder. My improved spike may also be retracted into its protecting housing, a construction which obviates the danger and inconvenience of the permanently projecting spikes such as are sometimes employed, the sharp contacting points of which are productive of damage to person or property.

It will be observed that by flattening the handle 32, as shown more particularly in Figure 4, the assembly of the device is facilitated, since the shank 32 may first be riveted into the spike 3 and the spike then placed in position within the housing, the said handle passing through the slot 45. The assembly is then completed by welding in position the back plate 43.

While I have herein described and illustrated a preferred embodiment of my invention, it will be understood by those skilled in the art to which the same relates that I may modify the same in various ways to suit any particular requirements without departing from the spirit of my invention.

Having thus described my said invention, what I claim and desire to secure by Letters Patent of the United States is:

1. In a device of the character described, the combination, with a housing formed from a strip of sheet metal bent longitudinally to form a U-shaped cavity having laterally extending flanges adapted to be secured to the side rail of a ladder, of a cylindrical spike member slidably held in said cavity and provided with a laterally projecting shank, a longitudinal slot in said housing within which said shank slides, a plurality of notches in communication with said slot spaced therealong and adapted to selectively receive said shank, a recess in said spike, and a spring secured within said recess and frictionally engaging the inner surface of said cavity to prevent rotation of said spike.

2. In a device of the character described, the combination, with a housing formed from a strip of sheet metal bent longitudinally to form a U-shaped cavity having laterally extending flanges adapted to be secured to the side rail of a ladder, of a flat closure member secured to the legs of the U and in alignment with said flanges, a cylindrical spike member slidably held in said cavity and provided with a laterally projecting shank, a longitudinal slot in said housing within which said shank slides, a plurality of notches in communication with said slot spaced therealong and adapted to selectively receive said shank, a recess in said spike, and a spring secured within said recess and frictionally engaging the inner surface of said closure member to prevent rotation of said spike.

OTIS M. KIRLIN.