June 22, 1965 M. P. ALFANO 3,190,393

LADDER HAVING REMOVABLE RUNGS

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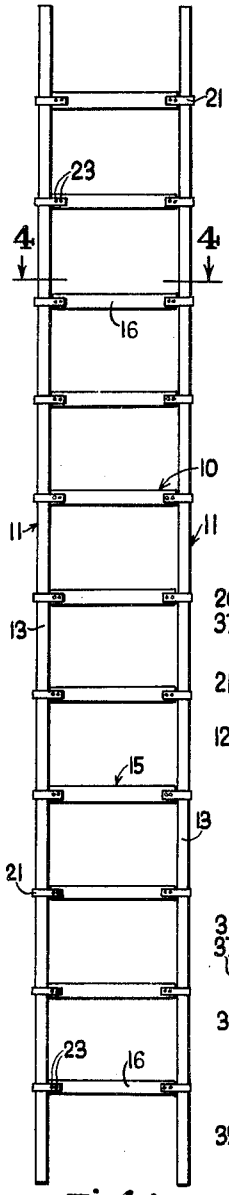


Fig. 1

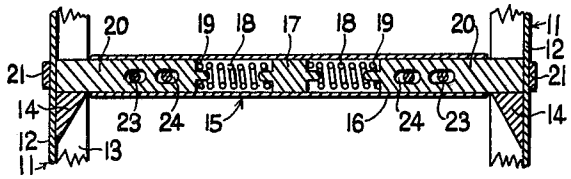


Fig. 3

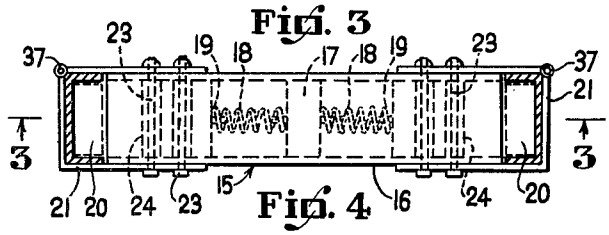


Fig. 4

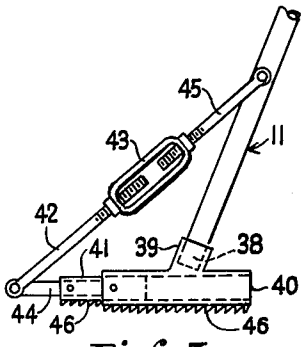


Fig. 5

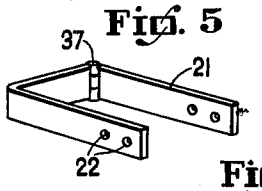


Fig. 6

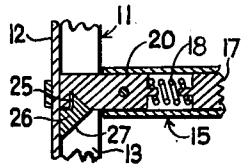


Fig. 7

Fig. 2

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LADDER HAVING REMOVABLE RUNGS

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This invention relates to a structure used in materials handling and, more particularly, to a structure in the form of a ladder upon which man climbs in order to place or remove any object from one level of a shelf, or the like, to another level or to a platform on any one, or part of, structure against which the ladder is placed.

The moment one speaks of materials handling one immediately thinks of industry; however, on second thought one will at once realize that, technically speaking, the movement of any object from one place to another is materials handling and unless the object is on or very near ground or floor level, or unless one is employing the help of some mechanical lifting device, such as a lift truck or elevator, one must have a ladder in order to do the job successfully. The ladder is, therefore, one of man's most valuable tools, and is found in nearly every kind of service from that of providing a means for a youngster to remove a desired book from a closet shelf to that of the housewife hanging a bath curtain, and the plant maintenance man replacing a burned-out electric bulb in a factory.

Ladders are made in numberless different forms, lengths and materials, and while this present invention can actually be adapted to any form of ladder, the preferred form is what is generally termed in hardware catalogs a long ladder and its associated type, the extension ladder, which is actually two long ladders connected together to provide a ladder of greater length than one would otherwise have.

So far as known, all ladders have to date been provided with rungs that are firmly secured in place, thereby limiting their versatility by reason of the fact that they cannot be completely disassembled, as can the present invention.

It is, therefore, the primary object of this invention to provide a ladder having removable rungs that will permit the ladder to be disassembled into a very compact package.

Another object of this invention is to provide a ladder with not only removable rungs, but also with a removable platform on which can be placed tools necessary for one to work with on any given job, such as window washing and the like.

Another object of this invention is to provide a ladder having removable rungs as well as a removable platform, thereby permitting certain rungs to be removed at the platform level in order that window wash buckets and/or other large objects may be placed on the platform.

Another object of this invention is to provide a ladder having removable rungs that can be readily replaced if damage or broken.

Still another object of this invention is to provide a ladder having removable rungs that will permit the assembly of a ladder of any desired rung width.

The nature and advantages of the invention will be better understood when the following description is read in connection with the accompanying drawing, the invention residing in the construction, combination and arrangement of parts as claimed.

In the drawing forming part of this specification like numerals of reference indicate similar parts in the several views and wherein:

FIGURE 1 is a front view of a typical long ladder made according to this specification.

FIGURE 2 is a perspective view of a portion of a typical long ladder made according to this specification showing not only the removable rungs but also the removable platform and its supporting structure.

FIGURE 3 is a sectional view taken substantially along line 3—3 of FIGURE 4.

FIGURE 4 is a sectional view taken substantially along line 4—4 of FIGURE 1.

FIGURE 5 is a side view of a typical ladder shoe not shown in any other view in the drawing.

FIGURE 6 is a perspective view of one detail part of this invention.

FIGURE 7 is a sectional view of an optional method of assembly of one end of a typical rung to the vertical portion of a ladder.

Referring more particularly to the drawing, the numeral 10 indicates a typical long ladder made according to this specification and embodying a pair of equally spaced parallel side members 11, each one of which is, in fact, a channel having a web 12 and flanges 13. A plurality of blocks 14, that are triangular when viewed from either end, are secured within each channel-shaped side member 11, as one can see on examination of FIGURE 2 of the drawing, where it is also seen that each one of the blocks 14 provides a support for the ends of the rung 15. Each rung 15 comprises a hollow rectangular holder 16 in which is centrally located a stationary brace member 17 having a coil spring 18 on each side thereof. The outer end 19 of each coil spring 18 presses against the inner end of a sliding lock block 20 that rests on top of one of the aforesaid blocks 14, thereby providing support for each rung 15. A U-shaped locking band of metal 21 horizontally encompasses, in part, each one of the side members 11. The ends of each one of the just mentioned U-shaped locking bands of metal 21 are provided with a pair of horizontally disposed openings 22 through each side thereof in which is placed the locking pins 23 that must obviously also pass through the elongated opening 24 in the sliding lock block 20. This detail of construction is best shown in FIGURES 3 and 4 of the accompanying drawing, where it is also seen by looking at FIGURE 7 that the aforesaid sliding lock block 20 may be modified by having an inverted V-shaped recess 25 in the underside thereof that receives the upturned V-shaped projection 26 of the modified block that is now indicated by the number 27 instead of the previously indicated block 14.

A material-supporting platform 28, that is preferably rectangular when viewed from the top, has one end 29 resting on top of one of the rungs 15, while the other end 30 of the same platform 28 is supported by a pair of diagonal brace rods 31, one brace rod being secured to each side 32 of the end 30 of the platform 28, while the upper end of each one of the aforesaid brace rods 31 is secured to a pin 33 that projects horizontally out from the end 34 of one of the U-shaped locking bands of metal 21. The pin 33 also provides support for the upper end of the vertically disposed tie rod 35 that has its lower end secured to an alike pin 36 that projects horizontally out from another one of the aforesaid U-shaped locking bands of metal 21, thereby providing a new and novel means of securing the platform 28 in any desired place on the ladder 10. The platform 28 is only shown in FIGURE 2 of the appended drawing.

Although not previously mentioned, the aforesaid U-shaped locking band of metal 21 is actually made of two separate pieces of metal secured together by a corner hinge 37 in order to permit a speedier assembly and disassembly of this ladder having removable rungs that I have invented.

Another novel feature of this invention is illustrated in FIGURE 5 of the accompanying drawing, where it is seen that the lower end 38 of the side members 11 may be placed in an angularly disposed socket 39 of the ladder

shoe 40 that is provided with a telescoping end 41, to the outer end of which is hingedly secured the lower end 42 of the turnbuckle 43 by means of the rod 44. The turnbuckle 43 has its upper end 45 hingedly secured to the aforesaid side member 11. The bottom of both the telescoping end 41 and the ladder shoe 40 is provided with a plurality of serrations 46 that will prevent the ladder from slipping if placed on a smooth surface. This is an additional safety feature not found on any other known ladder, regardless of its type. Although it is not shown in FIGURE 5 of the accompanying drawing, the socket 39 may be hinged to the ladder shoe 40 in order to permit one to change the angle of lean of the ladder. This shoe portion of the invention is of value when the ladder is an extension ladder and has been raised to a great height since a fall from the ladder due to its tipping could be fatal to whomever may be on the same. The serrations 46 will obviously prevent the ladder from tipping, no matter what its length may be.

It is believed that from the foregoing description the nature and advantages of the invention will be readily apparent, but it is desired to have it understood that I do not limit myself to the exact construction and arrangement of parts shown, as various changes may be resorted to when desired as fall within the scope of what is claimed.

What is claimed is:

1. A ladder having removable rungs, comprising a pair of equally spaced and parallel side members in channel form having a plurality of equally spaced blocks that are triangular when viewed from the end secured to the inner side thereof in which is removably placed and secured a plurality of equally spaced spring-loaded rungs and each one of the rungs embodying a hollow rectangular holder having a stationary brace member in the center thereof against each outward side of which is located a coil spring that presses against a sliding block that has its outer end resting on top of one of the blocks that is secured to the said side member of the said ladder and a substantially

U-shaped band having a hinge in the middle, extending around each upright at each end of each step with the ends of each band secured to the corresponding rung.

2. A ladder having removable rungs, comprising a pair of equally spaced and parallel side members in channel form having a plurality of equally spaced blocks that are triangular when viewed from the end secured to the inner side thereof in which is removably placed and secured a plurality of equally spaced spring-loaded rungs and each one of the rungs embodying a hollow rectangular holder having a stationary brace member in the center thereof against each outward side of which is located a coil spring that presses against a sliding block that has its outer end resting on top of one of the blocks that is secured to the said side member of the said ladder and a hinged U-shaped locking band of metal encompassing in part each one of the said side members at the location of each one of the first mentioned blocks, each said U-shaped locking band of metal being secured to said rectangular holder by a pair of removable pins that pass through elongated openings in the said sliding blocks, thereby providing additional means of locking the rungs in place on the said ladder.

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