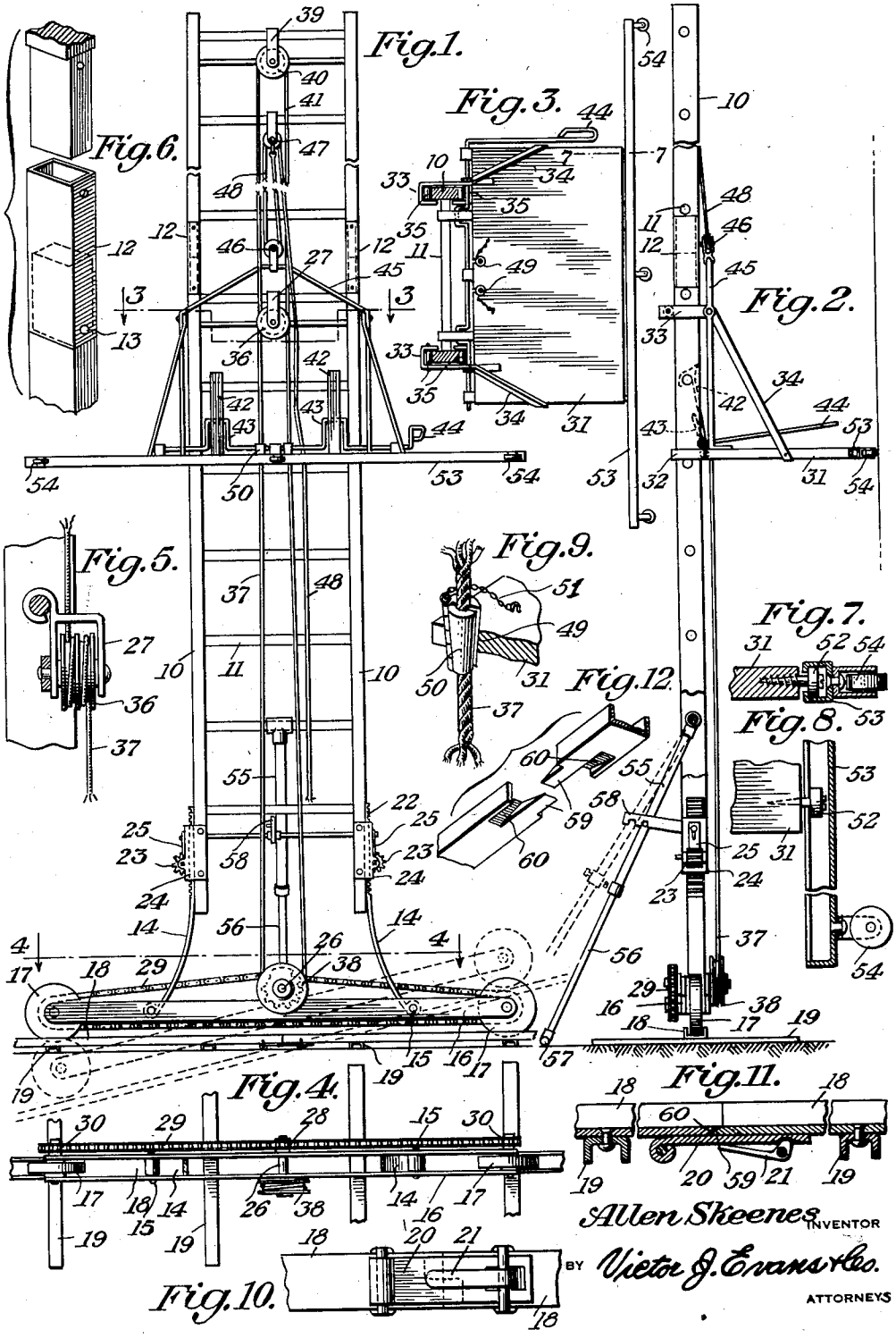
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LADDER

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LADDER

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The invention relates to a ladder and more especially to an adjustable platform ladder.

One of many objects of the invention is the provision of a ladder of this character, wherein a wheeled vehicle carries the same so that such ladder is susceptible of movement for the placement thereof at desired localities with respect to the vertical wall of an edifice and the platform is carried by the ladder for the convenience of the user of the same, the ladder being extensible and the platform adjustable.

Another object of the invention is the provision of a ladder of this character wherein the carriage is movable in a track and the ladder is susceptible of angular adjustment to accommodate itself to the characteristic of foundation upon which the ladder is arranged, there being a prop to prevent the toppling over of the ladder and the platform carried is susceptible of elevation and is latched in its adjusted position.

A still further object of the invention is the provision of a ladder of this character which is comparatively simple in construction, thoroughly reliable and efficient in its purposes, strong, durable, and inexpensive to manufacture.

With these and other objects in view, the invention consists in the features of construction, combination and arrangement of parts as will be hereinafter more fully described in detail, illustrated in the accompanying drawing, which discloses the preferred embodiment of the invention, and pointed out in the claims hereunto appended.

In the accompanying drawing:

Figure 1 is an elevation of a ladder constructed in accordance with the invention, showing by full lines one position of the carriage and by dotted lines another position thereof.

Figure 2 is a side elevation.

Figure 3 is a sectional view on the line 3—3 of Figure 1 looking in the direction of the arrows.

Figure 4 is a sectional view on the line 4—4 of Figure 1 looking in the direction of the arrows.

Figure 5 is a fragmentary vertical sectional view showing in detail one of the duplex pulleys.

Figure 6 is an exploded perspective view showing the interfitting connection of the side rails of the ladder proper.

Figure 7 is a sectional view on the line 7—7 of Figure 3.

Figure 8 is a horizontal sectional view of Figure 7.

Figure 9 is a fragmentary sectional perspective view showing in detail a rope clamp.

Figure 10 is a fragmentary bottom plan view of the track showing in detail the coupling latch for the sections thereof.

Figure 11 is a fragmentary vertical longitudinal sectional view through the track at the latch for the sections of the same.

Figure 12 is a fragmentary exploded perspective view of the track sections, showing the interfitting relation at their meeting ends.

Similar reference characters indicate corresponding parts throughout the several views in the drawing.

Referring to the drawing in detail, the ladder comprises spaced parallel side rails 10 and intermediate spaced transverse rungs 11, these being joined to the side rails in any suitable or desirable manner and such side rails are preferably sectional so that the ladder is susceptible for extension. The sections of each side rail 10 telescope at their meeting ends into a coupling sleeve 12 and each end is detachably secured by a removable fastener 13, the coupling sleeve 12 being countersunk so that its outer faces will be flush with the outer faces of the sections of the side rails 10, as should be apparent in Figure 6 of the drawing.

The side rails 10 have fitted therewith near their lower ends curved racks 14, these being pivoted at 15 to a carriage 16, its traction wheels 17 being journaled at opposite ends of the same and adapted to travel in a channeled track including the separable sections 18, each having lateral spread tread pieces 19 which constitute cleats for gripping engagement with a foundation or ground. The sections 18 are detachably joined with each other by means of a latch 20 releasably held by a hand actuated keeper cam 21. The racks 14 are provided with the rack teeth 22 meshing with rack gears 23 journaled in mountings 24 upon the side rails 10. The rack gears 23 are locked by releasable keeper pawls 25 upon the mountings 24. Thus it will be seen that by adjustment of the racks 14 the carriage 15 can be shifted from horizontal to an angular position so that the ladder may be sustained perpendicular when upon a grade.

The carriage 16 intermediate thereof is fitted with a stud shaft 26 which is suitably journaled in the carriage. The shaft 26 carries a sprocket gear 28 over which is trained an endless sprocket chain 29, the same being also trained over sprocket gears 30 joined with the traction wheels 17 so that on the turning of the shaft 26 motion will be imparted to the traction wheels 17 for the traversing by the carriage 16 of the track to effect placement of the ladder in the use thereof.

Slidably arranged on the side rails 10 is a platform 31 having the lower yokes 32 which loosely embrace the side rails 10 and the upper yokes 33 likewise loosely embracing the side rails 10 and a part of braces 34 for said platform 31. These yokes 32 and 33 are fitted with anti-friction rollers 35 which contact with the side rails 10 to assure easy shifting of the platform in the adjustment thereof.

Upon an intermediate rung 11 centrally thereof is supported a hanger 27 in which is journaled a double pulley 36 about which is trained an actuator cable 37, the same being also trained about a pulley 38 fixed to the stud shaft 26 and on actuation of either stretches of the cable 37 motion will be imparted to the sprocket chain 29 for transmitting rotation to the traction wheels 17 of the carriage 16 for its travel upon the track, as should be apparent, and in this fashion the ladder can be arranged for determined placement relative to a vertical wall of an edifice.

Mounted upon a selected rung 11 above the hanger 37 is another hanger 39 carrying a single pulley 40, the same having trained thereover the actuator cable 41 which is also trained over the double pulley 36 so that a user of the ladder, at a high point upon the same, can readily and conveniently actuate the sprocket chain 29 for imparting rotation to the traction wheels 17. The arrangement of the pulleys 36 and 40 upon the ladder permits the separation of the uppermost section of the same without disturbing the cable 37 in its arrangement for the driving of the carriage 16.

The platform has swingingly connected thereto retaining hooks 42, these being engageable with selected rungs 11 and controlled by cranks 43 of a releasing pedal 44 swingingly supported uopn the platform 31, it being seen that by depressing the pedal 44 the cranks 43 will move the hooks 42 out of engagement with a rung 11 when hooked thereon. The hooks 42 are so formed as to ride over the rungs 11 of the ladder on the upward pressure of the platform 31 upon the ladder.

Bridging the braces 34 is an upwardly arched bail 45 carrying a pulley 46, while upon a rung 11 is a companion pulley 47, these pulleys being fitted with a hoisting cable 48 manually controlled by an operator when upon the platform for the raising and lowering of such platform, as should be obvious from Figure 1 of the drawing.

Provided in the platform 31 are ways 49 for the stretches of the cable 37 and such ways open through the edge of the platform next to the side rails 10 so that the stretches of the cable 38 can be released from said ways. Insertable in the ways 49 are wedging rope clamps 50, each being of a double jaw hingedly connected type and of truncated inverted cone formation so that when these clamps are inserted in the ways 49 they will grip and wedge the stretches of the cable 37 to hold fast such cable on adjustment of the same for the placement of the ladder relative to the work and thus avoiding any accidental shifting of the same from its placement. Each clamp 50, through a chain 51, is connected with the platform 31 to avoid detachment of such clamp from the platform.

At the edge of the platform 31, next to the work, there is provided rollers 52, these received in a channeled rest rail 53 carrying rollers 54 for engagement with the work and such rail 53 functions to span a gap or a door frame space or window frame space to permit of the convenient shifting of the ladder crosswise thereof under the travel of the carriage 16 in the track sections 18. It should be apparent that the rail 53 is susceptible of movement relative to the platform 31 for the fixing of the position of this rail in the handling of the ladder.

Connected with a rung 11 at the lower end of the ladder is a prop 55, it being preferably swingingly connected centrally with the rung and provided with an extensible section 56 having a foot 57 for contact with a foundation or ground, the prop 55 being susceptible of latching in angular adjusted position by a keeper 58 suitably carried at the lower end of the ladder and such prop will sustain the ladder in upright or perpendicular position to avoid any liability of the same toppling over, as well as maintaining proper working position of said ladder and its platform 31 to the work.

It should be obvious that the ladder in its construction and arrangement is handy for regulation to a piece of work and is susceptible of convenient and easy adjustment for the proper placement of the same with relation to the work, the platform being readily and conveniently raised or lowered with safety and under the control of the user of the ladder.

In Figure 12 of the drawing it will be seen that the meeting ends of the sections 18 of the track one-half of each is formed with a beveled protuberance or projection 59, while the side of each section to that of the protuberance or projection side is provided with a depression 60 so that the protuberance or projection will fit into it on the meeting of the sections and this overlapped interfitting relation prevents either end of said section from rising to obstruct the wheels 17 while being operated on uneven ground.

What is claimed is:

1. A ladder of the character described comprising a plurality of rung sections detachably coupled with each other, a carriage for the ladder, means for angularly adjusting the carriage with relation to the ladder, traction wheels on the carriage, a track for the wheels, means carried by the ladder for operating the traction wheels to impart travel to the carriage when supporting the ladder, and an adjustable platform supported by the ladder.

2. A ladder of the character described comprising a plurality of rung sections detachably coupled with each other, a carriage for the ladder, means for angularly adjusting the carriage with relation to the ladder, traction wheels on the carriage, a track for the wheels, means carried by the ladder for operating the traction wheels to impart travel to the carriage when supporting the ladder, an adjustable platform supported by the ladder, and a rest rail movable relative to the platform and having rollers.

3. A ladder of the character described comprising a plurality of rung sections detachably coupled with each other, a carriage for the ladder, means for angularly adjusting the carriage with relation to the ladder, traction wheels on the carriage, a track for the wheels, means carried by the ladder for operating the traction wheels to impart travel to the carriage when supporting the ladder, an adjustable platform supported by the ladder, a rest rail movable relative to the platform and having rollers, hooks on the platform for engagement with selective rungs, and means manually operated for the release of said hooks.

4. A ladder of the character described comprising a plurality of rung sections detachably coupled with each other, a carriage for the ladder, means for angularly adjusting the carriage with relation to the ladder, traction wheels on the carriage, a track for the wheels, means carried by the ladder for operating the traction wheels to impart travel to the carriage when supporting the ladder, an adjustable platform supported by the ladder, a rest rail movable relative to the platform and having rollers, hooks on the platform for engagement with selective rungs, means manually operated for the release of said hooks, and means for locking the second-named means and removably fitted in the platform.

5. A ladder of the character described comprising a plurality of rung sections detachably coupled with each other, a carriage for the ladder, means for angularly adjusting the carriage with relation to the ladder, traction wheels on the carriage, a track for the wheels, means carried by the ladder for operating the traction wheels to impart travel to the carriage when supporting the ladder, an adjustable platform supported by the ladder, a rest rail movable relative to the platform and having rollers, hooks on the platform for engagement with selective rungs, means manually operated for the release of said hooks, means for locking the second-named means and removably fitted in the platform, and a prop for the ladder and angularly adjustable.

6. A ladder of the character described comprising a plurality of rung sections detachably coupled with each other, a carriage for the ladder, means for angularly adjusting the carriage with relation to the ladder, traction wheels on the carriage, a track for the wheels, means carried by the ladder for operating the traction wheels to impart travel to the carriage when supporting the ladder, an adjustable platform supported by the ladder, a rest rail movable relative to the platform and having rollers, hooks on the platform for engagement with selective rungs, means manually operated for the release of said hooks, means for locking the second-named means and removably fitted in the platform, a prop for the ladder and angularly adjustable, and lateral spreads on said track and forming ground cleats.

7. A ladder of the character described comprising a plurality of rung sections detachably coupled with each other, a carriage for the ladder, means for angularly adjusting the carriage with relation to the ladder, traction wheels on the carriage, a track for the wheels, means carried by the ladder for operating the traction wheels to impart travel to the carriage when supporting the ladder, an adjustable platform supported by the ladder, a rest rail movable relative to the platform and having rollers, hooks on the platform for engagement with selective rungs, means manually operated for the release of said hooks, means for locking the second-named means and removably fitted in the platform, a prop for the ladder and angularly adjustable, lateral spreads on said track and forming ground cleats, and means slidably connecting the platform with the rung sections.

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