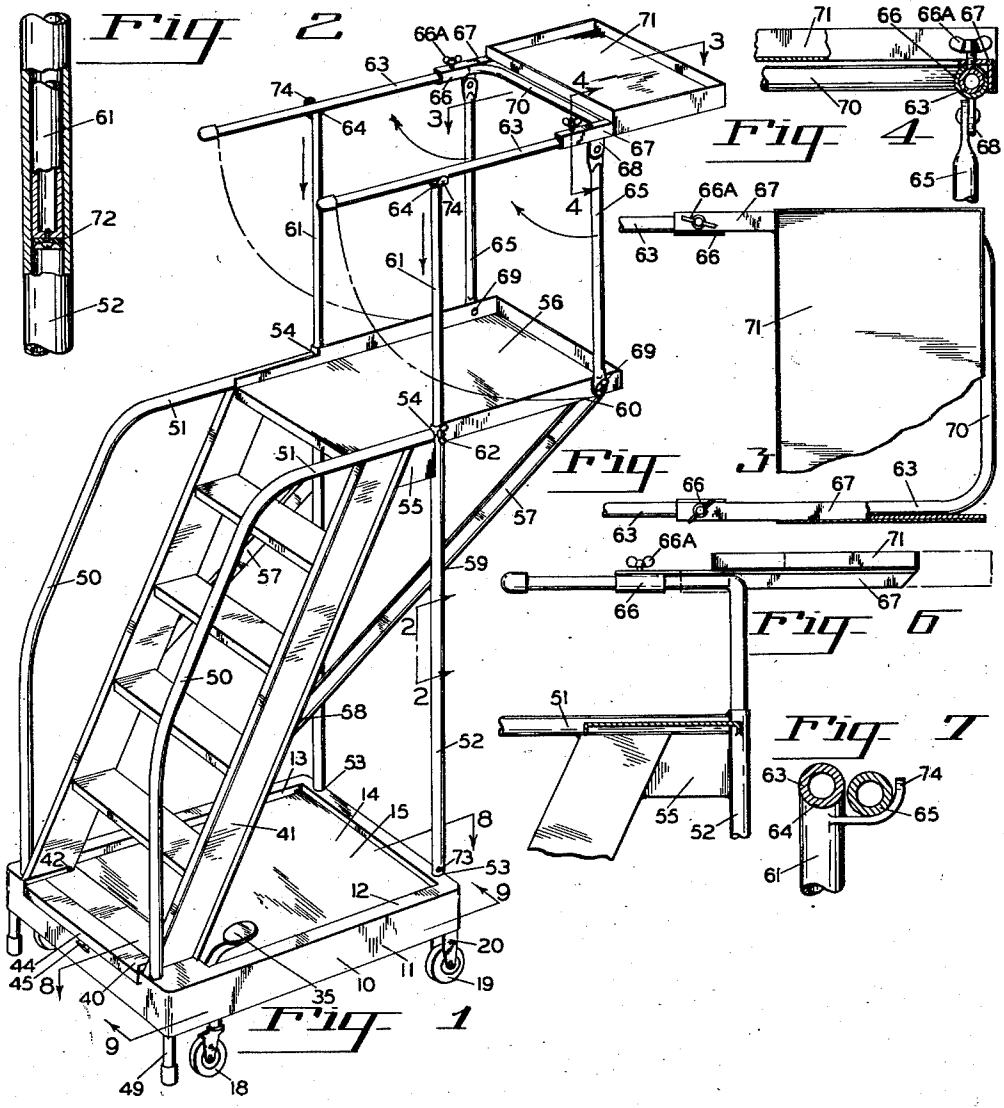
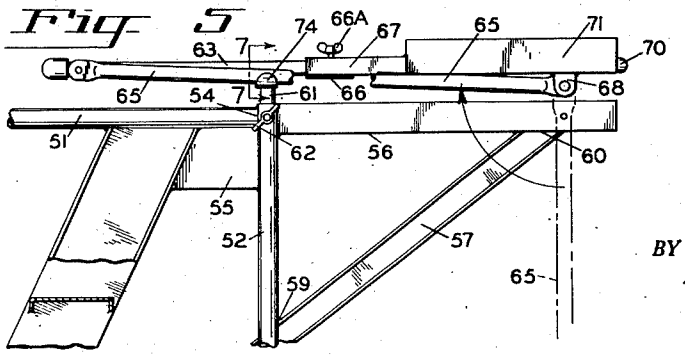
July 9, 1957 G. P. EASTON 2,798,652

MOBILE LADDERS AND PLATFORMS

Filed Jan. 12, 1955 2 Sheets-Sheet 1





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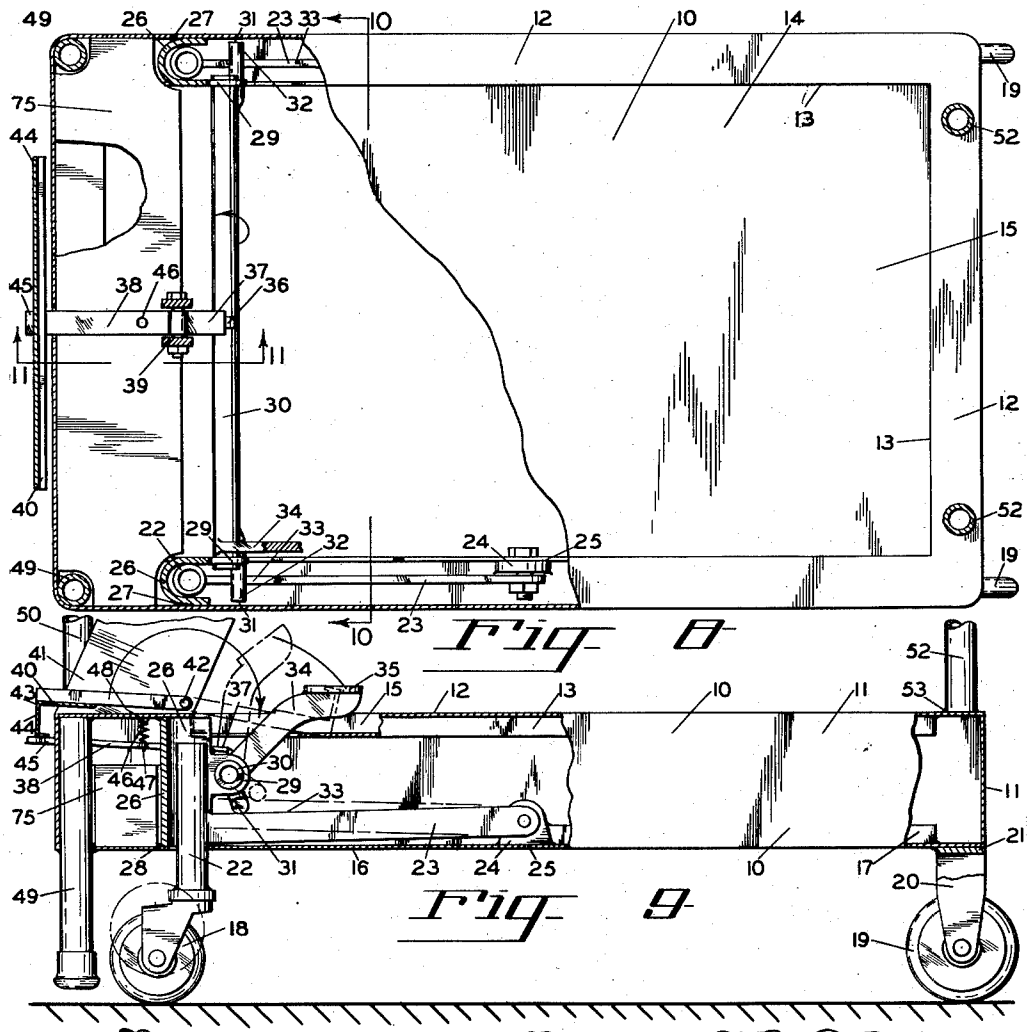


Fig. 8

Fig. 9

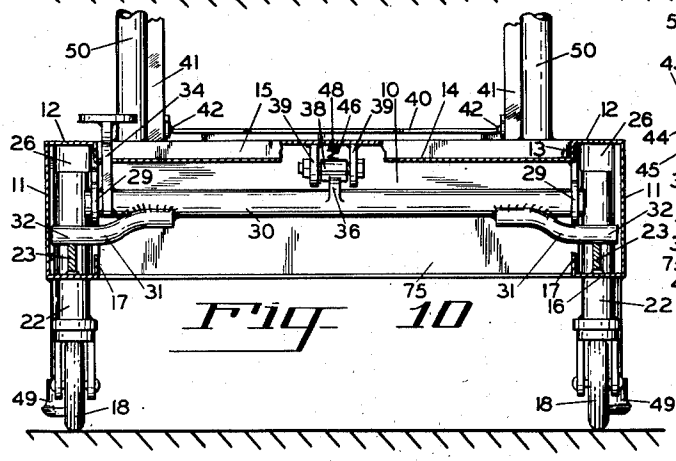


Fig. 10

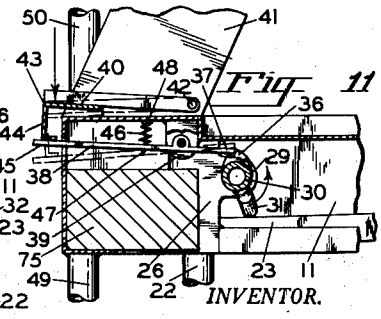


Fig. 11

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2,798,652

MOBILE LADDERS AND PLATFORMS

George P. Easton, Portland, Oreg.

Application January 12, 1955, Serial No. 481,387

5 Claims. (Cl. 228—5)

This invention relates to mobile ladders and platforms and is particularly adapted to be used for overhead maintenance in buildings and the like.

The primary object of the invention is to provide a mobile ladder and platform that can be safely and easily converted from a movable ladder into a movable ladder and platform.

Another object of the invention is to provide a mechanism within the ladder structure that is automatic in operation when converting the same from a movable platform to a firm or stationary platform.

Another object of the invention is to provide in a mechanism of the type described, adequate and adjustable guard rails to protect the workmen from accidents.

Another object of the invention is to provide dash pot mechanisms for safely lowering the work tray and guard rail assembly.

Another object of the invention is to provide carrying space within the ladder assembly for transporting equipment therewith.

Another object of the invention is to design the ladder and platform so that the same can be telescoped to a minimum height for passing through door openings and for operating under low ceilings.

Another object of the invention is to provide a work tray which is movable for elevation as well as a horizontal position in connection with guard rails so that the operator can work freely and safely.

Other and further objects and advantages of this invention will become more apparent from a consideration of the following specification when read in conjunction with the annexed drawings, in which:

Figure 1 is a perspective view of an assembled ladder and platform, constructed in accordance with this invention, showing the same ready for use.

Figure 2 is a fragmentary enlarged detail view of one of the supporting members, partially broken away, illustrating the dash pot arrangement in connection with the lowering of the tray and railing.

Figure 3 is a plan view, taken on line 3—3 of Figure 1, illustrating a plan view of the work tray, partially broken away for convenience of illustration.

Figure 4 is an enlarged detail sectional view of the railing and tray construction, taken on line 4—4 of Figure 1.

Figure 5 illustrates how the railing and tray are folded out of working position.

Figure 6 is a detail side view of another preferred form of construction of ladder wherein the overhang platform is eliminated.

Figure 7 is a fragmentary section taken on line 7—7 of Figure 5.

Figure 8 is a plan view of the base of the ladder and platform, taken on line 8—8 of Figure 1, parts broken away for convenience of illustration.

Figure 9 is a side view of Figure 1, partially broken away for convenience of illustration.

Figure 10 is an end sectional view, taken on line 10—10 of Figure 8.

Figure 11 is a fragmentary sectional view, taken on line 11—11 of Figure 8.

Referring more specifically to the drawings, this new and improved ladder and platform consists of a box-like base 10, consisting of side walls 11 which are laterally bent at right angles to form a top wall 12 at their upper ends. The top wall 12 is reversely bent at right angles to provide side walls 13, and the side walls are bent laterally at right angles to provide an integrally formed countersunk tray 15. The lower edges of the side walls 11 are bent laterally inwardly to form a bottom wall 16, and again upwardly to form a side wall 17, the bottom of the base being open. By constructing the base as above described, a relatively light material having a maximum of strength can be used due to the shaping of the material.

The base 10 is supported upon caster wheels 18 at one end, and upon the wheels 19 on its opposite end. The wheels 19 are journalled within forks 20, which are non-rotatable and fixedly secured to the base at 21. The caster wheels 18 are journalled within sockets 22 which are fixedly secured to one end of the arms 23. The other end of the arms 23 are pivotally connected on the brackets 24, the latter being fixedly secured to the bottom wall 16 at 25. The sockets 22 are guided within the U-shaped guides 26 which are fixedly secured to the base 10 at 27 and 28 by welding or other means.

Ears or brackets 29, integrally formed with the U-shaped guides, are adapted to support opposite ends of the cross shaft 30 which is journalled for rotation therein. The cross shaft 30 is provided with cams 31 which extend beyond the ends of the shaft at 32 and are adapted to ride on the upper surface 33 of the arms 23.

A lever 34 is fixedly attached to the cross shaft 30 and has a foot pedal 35 on its upper end adapted to be operated manually by an operator. A dog 36 is fixedly formed on the shaft 30 and is adapted to engage the end 37 of the pawl 38. The pawl 38 is pivotally mounted to the brackets 39 which are fixedly secured to the underside of the top of the base 10.

A treadle 40 is pivotally mounted to the base of the ladder 41 at 42. The forward edge 43 of the treadle has a foot 44 extending downwardly. This foot is adapted to engage the outer end 45 of the pawl 38, as best illustrated in Figures 7, 8 and 10. The end 45 and the treadle 40 are normally held in a raised position by the spring 46. The spring 46 has one of its ends connected to the pawl at 47 and to the under surface of the top of the base at 48. The end 37 of the pawl is adapted to engage the dog 36 and when so engaged the cams 31 will raise the leg 49 of the base 10 from the supporting surface by forcing the arms 23 and the casters 18 downwardly, supporting the weight of one end of the base thereon until the pawl is disengaged from the dog by the action of the treadle 40, which will be more fully described later on.

The ladder 41 is fixedly mounted to the base 10 by welding or other means. The hand rails 50 are fixedly secured to the base and have their horizontal runs 51 secured to the top of the ladder 41 by welding, as best illustrated in Figure 1. Vertical standards 52 are fixedly secured to the base 10 at 52 and to the horizontal runs 51 at 54. This assembly is further braced by the gussets 55.

A platform 56 is supported at one of its ends on the top of the ladder 41 and the standards 52, and is supported at its opposite end by the diagonal braces 57, which are secured to the ladder at 58, to the standard 52 at 59, and to the platform 56 at 60. Vertical standards 61 adjustable for height are telescoped within the standards 52, and are maintained at any adjusted position by the set screws 62. Hand rails 63 are fixedly secured to the upper

ends of the vertical standards **61** at **64**. The hand rails **63** are further supported by the vertical standards **65**.

Sleeves **66** are welded to the inner ends of the extension bars or angles **67** and are adapted to receive the ends of the rails **63**. Ears **68** extend downwardly from the sleeves and have the upper ends of the standards **65** pivotally connected thereto. The lower ends of the standards being affixed to the platform **56** at **69** by bolts and wing nuts. The hand rails **63** terminate in a U-shaped end **70**.

A work tray **71** is fixedly secured to the upper surfaces of the extensions **67** and may be adjusted away and towards the operator standing on the platform **56**. The lower end of the standards **61** have air sealing cups **72** affixed to their lower ends, which act as dash pots so that the tray assembly and railing **63**, when lowered to the level of the platform best indicated in Figure 5, will not drop suddenly. The sealing cup **72** traps the air within the standards **52** and the air being gradually released through the bleeder holes **73** located at the bottom of the standards **52**.

Outwardly extending brackets **74** are located on the upper ends of the standards **61** and are adapted to support the folding standard **65** while in folded position. Counterweights **75** are located in the forward end of the base and are adapted to counterbalance the weight of the operator while standing on the outer end of the platform **56**.

In Figure 6 another preferred form of ladder and platform is illustrated, wherein the overhanging platform **56** is eliminated and only the guard rail and tray is used. This type of ladder and platform is used where it is not necessary for the operator to be extended beyond the confines of the platform. It will be noted that the top **14** of the platform is countersunk within the platform, the object of this is so that maintenance equipment and supplies can be moved about with the ladder and platform in the performing of various operations.

The operation of this new and improved ladder and platform will now be described. When used as illustrated in Figure 1, the standards **61** are raised from the position shown in Figure 5 and locked in adjusted position by the set screws **62**. The folding standards **65** are removed from their hooks **74** and brought to the position shown in Figure 1 and attached to the platform **56** by the bolts and wing nuts **69**. The tray assembly is then moved to the position shown from that shown in Figure 5 by loosening the set screws **66A** and sliding the extension members **67** outwardly on the rails **63** to the desired location.

Ordinarily the ladder and platform are carried on the wheels **19** and caster wheels **18**, allowing it to be pushed about from place to place, but when finally located it is desirable to instantaneously lock the ladder to the supporting surface so that it will not move when the operator climbs the ladder and stands on the platform **56**. When he places his foot on the treadle **40**, the foot **44** of the treadle will push the end **45** of the pawl **38** downwardly, referring particularly to Figure 10. This will disengage the end **37** of the pawl from the dog **36**.

The weight of the ladder and platform will cause the cams **31** to rotate in the direction of the arrow, permitting the arms **23** to raise to the broken line position in Figure 9, dropping the legs **49** down on the supporting surface, thus preventing the ladder and platform from moving while the workman is performing his work on the platform **56**. The railing **63** is always in position while the workman is working on the platform **56**. This railing can be raised even higher than is shown in the drawing and a box or other object may be used to set on the platform **56**, raising the workman still higher in emergency work. In this event the standard **65** would have to be exchanged for longer ones.

This ladder and platform is especially adapted to be used in rooms having overhead lighting to be maintained, although I do not wish to be limited to any particular use for the device, as it is adapted to many.

In order to raise the supporting legs **49** away from the supporting surface the operator presses down on the pedal **35** which rotates the shaft **30**, cams **31**, which in turn raises the platform by forcing the bars **23** down, together with the casters **18**, thereby raising the legs **49** from the supporting surface allowing the ladder and platform to be moved about. This operation can take place when the operator is on the platform working by another operator who then can move the ladder and platform while the workman is on the platform **56**.

When the railing **63** is lowered to the position shown in Figure 5, the entire unit can be moved through doorways and through restricted places, but after being located in the desired location as described above the railing is brought up into operating position so that the workman is protected in performing his maintenance work.

Although a certain specific embodiment of the invention has been shown and described, it is obvious that many modifications thereof are possible. The invention, therefore, is not to be restricted except insofar as is necessitated by the prior art and by the spirit of the appended claims.

What is claimed is:

1. A ladder device comprising a pair of upwardly extending spaced and parallel side members, a plurality of longitudinally spaced risers connected to and extending between said members, a substantially rectangular base, said members having one of their respective adjacent ends connected with said base adjacent a side thereof, a pair of inverted substantially U-shaped members having the bight portions thereof secured to said base, said U-shaped members each having a wheel rotatably supported between the sides thereof, a pair of sockets, an elongated arm for each of said sockets, each of said arms having one of its ends fixedly secured to one of said sockets, respectively, the other ends of said arms being pivotally mounted on said base, said sockets each being disposed adjacent the other pair of corners of said base, a pair of caster wheels mounted for rotation within said sockets, a bracket secured to said base adjacent each of said sockets, a shaft rotatably supported in and extending between said brackets, a lever having one of its ends fixedly secured to said shaft, the other end of said lever projecting above said base, a pedal fixedly secured to said other end of said lever, a cam for each end of said shaft, said cam being adapted to engage said arms to force said caster wheels downwardly upon the exertion of force upon said pedal, a pair of elongated legs, said legs being disposed adjacent each of said other corners of said base and depending therefrom, means mounted on said base adjacent said one side thereof for moving said cam away from said arms, a pair of elongated substantially hollow tubular standards, said tubular standards having one of their respective ends fixedly secured to a side of said base oppositely disposed with respect to said first side thereof, a pair of upwardly extending hand rails, said hand rails having one of their respective adjacent ends secured to said one side of said base and the other ends thereof being fixedly secured to said standards adjacent the other ends thereof, means fixedly securing the other end of said side members to said other ends of said hand rails, an elongated substantially rectangular platform having an end thereof fixedly secured to said other ends of said side members, said platform overhanging said base, a pair of spaced substantially parallel rectangular braces having one of their ends fixedly secured to said side members, said braces having their respective other ends fixedly secured to the other end of said platform, a second pair of hollow tubular standards, said second pair of standards having one of their ends telescoped within said other ends of said first pair of tubular members, means for fixedly securing said second pair of standards in selective position relative to said first pair of standards, an elongated substantially U-

shaped hand rail, said hand rail having the arms thereof fixedly secured to the other ends of said second pair of standards, a sleeve slidably mounted on each arm of said U-shaped hand rail, a tray fixedly secured to said sleeve, means for securing said sleeves in adjusted position on said arms, a lug depending from each of said sleeves, a third pair of standards, means pivotally connecting one end of each of said last-named standards with said lugs, and means releasably securing the other end of said last-named standards to said platform.

2. A ladder as defined in claim 1, and a piston mounted on said telescoped ends of said second pair of standards.

3. A ladder as defined in claim 2, and means on said other ends of said second pair of standards for supporting said third pair of standards in pivoted position upon release of said other ends of said third standards from said platform.

4. A ladder device comprising a pair of upwardly extending spaced and parallel side members, a plurality of longitudinally spaced risers connected to and extending between said members, a substantially rectangular base, means connecting one of the adjacent ends of said members with said base adjacent a side thereof, said base being supported on a pair of wheels fixedly secured adjacent the corners thereof at the side of said base opposite said first side, a socket mounted in each of the other corners, said sockets each having one end of an arm fixedly secured thereto, means pivotally connecting the other ends of said arms on said base, a cross rod journalled for rotation on said base, a cam member secured on each end of said rod, each of said cam members having contact with one of said arms, respectively, whereby downward movement of said cams effects a pivotal movement upwardly of said first side of said base about the axis of said first pair of wheels, means for locking said base in pivoted position, a pair of depending legs having the upper ends thereof secured to said base each adjacent one of said second pair of wheels, the lower ends of said legs being elevated above the supporting surface of said wheels when said base is in its pivoted position, and means for releasing said locking means to effect an engagement of the legs with said supporting surface.

5. A portable ladder comprising a base, a pair of wheels secured to the underside of said base at one end thereof, a pair of legs positioned under said base at the opposite end thereof, a second pair of wheels positioned below said base adjacent said legs, said second pair of wheels and said first pair of wheels being adapted to support said base for movement on a supporting surface, means mounting said second pair of wheels in vertically adjustable relation to said base whereby said wheels can be adjusted to carry said base in one position and to permit said legs to carry said base in another position, releasable means for elevating said base with relation to said second pair of legs, said releasable means being adapted to maintain said base in elevated position until released, a pair of spaced parallel side members secured to the upper side of said base and extending upwardly therefrom, means extending upwardly from said base supporting the upper ends of said side members, a plurality of spaced parallel steps secured to and extending between said side members, means pivotally mounting the lowermost of said steps to said side members, said pivoted steps being adapted to be moved downwardly in use, means associated with said pivoted step for releasing said releasable means whereby said legs are permitted to move into contact with the supporting surface restraining said base against movement thereon.

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