April 18, 1961 W. A. KIBBY 2,980,200

COMBINATION HANDTRUCK AND LADDER

Filed Nov. 24, 1959

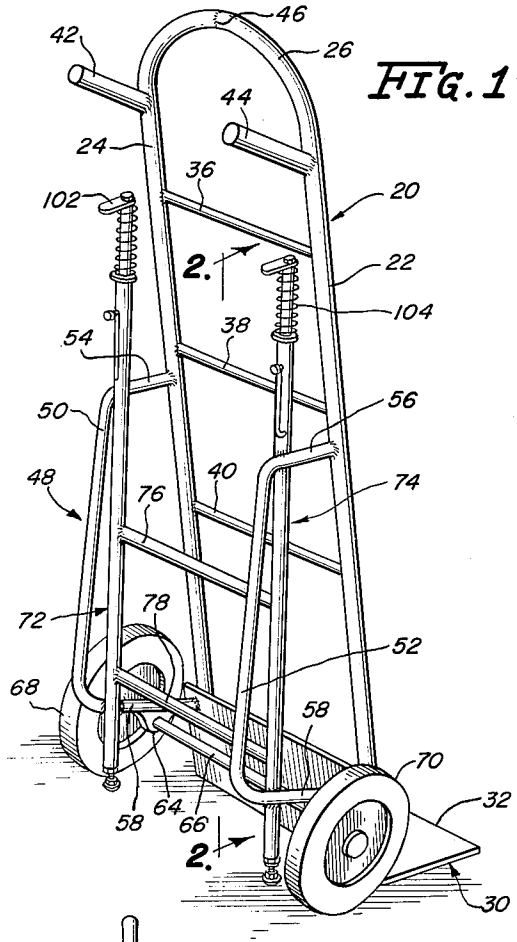


FIG. 1

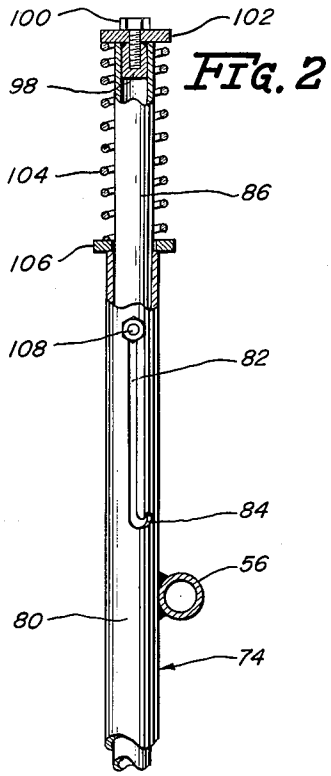


FIG. 2

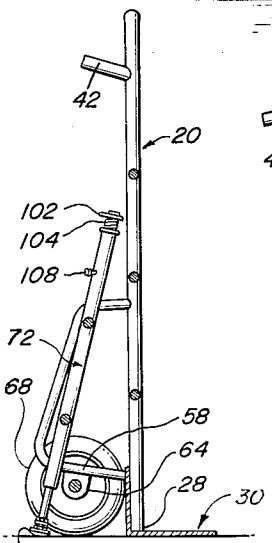


FIG. 3

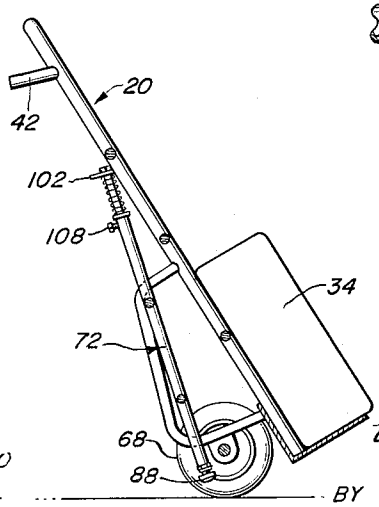
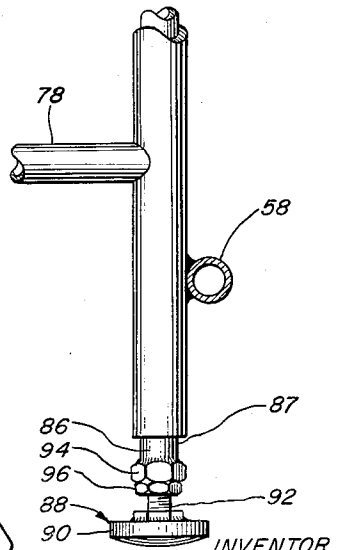


FIG. 4



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COMBINATION HANDTRUCK AND LADDER

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This invention relates generally to hand trucks and specifically to hand trucks having structural features permitting the use thereof as ladders for ascending and descending elevated structures such as truck vehicles and loading platforms.

One of the objects of the present invention is to provide a hand truck having a frame structure adapted for carrying loads and for use as a ladder.

Another object of the invention is to provide a combination hand truck and ladder having a light and durable construction.

A further object of the invention is to provide a combination hand truck and ladder having means for actuating the ladder into ladder and non-ladder positions.

Another object of the invention is to provide a combination hand truck and ladder structure which can be used as an independently supported ladder.

Other objects of the invention and advantages achieved thereby will appear from the following description, reference being made to the drawing, in which—

Fig. 1 is an isometric view showing the combination hand truck and ladder structure embodying the invention;

Fig. 2 is an enlarged view of a leg of the ladder structure, partly in section, disclosing details of an arrangement for extending and withdrawing the leg;

Fig. 3 is a side elevation taken along line 2—2 of Fig. 1 of the hand truck and ladder structure in its ladder position with legs extending; and

Fig. 4 is a side elevation taken along line 2—2 of Fig. 1 of the hand truck and ladder structure in its non-ladder position with the legs withdrawn.

Referring to Fig. 1, the invention comprises an elongated frame 20 having a pair of longitudinal members 22 and 24 generally parallel with respect to each other and maintained in their spatial arrangement by a curved portion 26 which is a continuation of the members 22 and 24 which have ends 28 suitably affixed, as by welding to a toe member or toe plate 30. The toe plate 30 is a rigid angular plate, generally L-shaped, and forms at its free end a lip 32 which is used to be inserted under an object, such as a crate 34 (Fig. 4) to effect transfer of the crate onto the hand truck and subsequently to hold the crate during transportation. The members 22 and 24 are further braced by transverse members 36, 38 and 40 which are preferably affixed by welding. A pair of handles 42 and 44 are affixed to the longitudinal members 24 and 22, respectively at the upper end on the frame 20 near the region of the curved portion 26. The longitudinal and the transverse members are preferably of tubular construction. Although the two longitudinal members 22 and 24 are shown as being formed from a unitary construction, it should be understood that the frame may be constructed of two separate longitudinal members joined together by welding as at a point 46.

Additional flexural and torsional stability is imparted to the frame 20 by an extendible ladder structure 48 forming part of said frame. The ladder structure comprises a pair of angularly shaped skid members 50 and 52 having bent portions 54 and 56 affixed to the longitudinal members 24 and 22, respectively, and having the other

bent portions 58 affixed suitably to the toe plate 30 as shown in Figs. 1 and 3. The bent portions 58 support a pair of axle support blocks 64 rotatively supporting an axle 66 having mounted thereon at each extremity thereof of rolling means such as wheels 68 and 70 which are suitably maintained thereon.

The skid members 50 and 52 have disposed alongside of each other and affixed thereto extendible leg members 72 and 74, respectively, which leg members are maintained in a predetermined disposition with respect to each other by transversely affixed rung members 76 and 78. The skid members 50 and 52 and rung members 76 and 78 are preferably made of tubular construction to minimize weight.

Referring to Fig. 2, there is disclosed in an enlarged view the construction of the leg member 74 comprising a longitudinal hollow member 80 having a slot 82, longitudinally disposed therein, said slot terminating in an arcuate portion 84. Slidably and rotatively disposed within the hollow member 80 is an inner element 86, preferably of tubular construction, which extends beyond both ends of the leg member 74 and has affixed at one end 87 thereof an adjustable foot member 88 comprising a disk 90 with a rounded bottom. The disk 90 is permanently attached to a threaded member 92 which is screwed into a nut member 94 affixed to the end 87 of the inner element 86. The disposition of the foot 90 with respect to the inner element is securedly maintained by a lock nut 96.

The other end of the inner element 86 terminates interiorly thereof in a tapped plug 98 secured to said inner element and adapted to receive a nut 100 for affixing a lever or knob member 102 to said inner element. The inner element 86 is always biased with respect to the hollow member 80 by suitable means such as spring 104 with a washer 106 disposed between said spring and the upper end of the hollow member 80.

The slidable and rotative movements of the inner element 86 within the hollow member 80 are determined by a stud like member such as a bolt 108 screwed into the inner element and cooperatively movable within the slot 82.

When the hand truck is used for transporting crates, the leg members 72 and 74 are in withdrawn positions, i.e. non-ladder position, as disclosed in Figs. 1, 2 and 4, so as not to interfere with the normal use of the hand truck. In the non-ladder position, the spring 104 maintains the inner element 86 in a withdrawn position as determined by the bolt 108 in its uppermost position in the slot 82. Of course, if preferable, the withdrawn position of the inner element 86 need not be limited by the position of the bolt 108; the limit of the withdrawn position would then be determined by the obtrusion of the nut member 94 against the end of the hollow member 80.

When the hand truck is to be used as a ladder to permit a truck driver to ascend onto the tail gate of a truck vehicle, the hand truck is placed in a vertical position so that it is supported by its toe plate 30 as shown in Fig. 3 and a downward force is applied by hand to each of the lever members 102 to compress the spring 104 and move the inner element 86 in a downward direction to extend the length of the leg member 72. During the foregoing movement, the bolt 108 slides downwardly in the slot 82 until the limit is reached, at which time a rotative movement is applied by hand to move the bolt into the arcuate portion 84 of the slot 82 (see Fig. 2) to a locked position. The hand truck is shown in ladder position in Fig. 3.

It will be noted that the disposition of the leg members is angular with respect to frame 20 so as to form an acute angle therewith of approximately 15°. The support basis for the ladder position of the hand truck is

established by the foot members 88 in conjunction with the toe member 30 on a supporting surface such as a floor. Although the wheels 68 and 70 rest on the floor, they play no important part in establishing the support basis. Because of the angular disposition of the leg member 72 and 74, the rung members 76 and 78 are displaced horizontally with respect to each other and thereby facilitate mounting thereof. The skid member 50 and 52 in addition to providing rigidity to the frame 20 also serve as means for the use of the hand truck in moving crates on a stairway wherein during movement of the hand truck from one step of the stairway to another step, the load is temporarily supported by said skid members resting on the step.

Although the foregoing description sets out in detailed manner the nature of the present invention, it is to be understood that the constructional features may be varied without departing from the scope or spirit of the invention claimed.

I claim:

1. A two wheel hand truck in combination with a ladder arrangement comprising a frame made of longitudinal members maintaining a fixed position to each other through attached transverse members, the frame having handles at one end thereof and a toe plate at the other end thereof, an extendible ladder structure comprising a pair of angular skid members affixed to the longitudinal members and forming means for mounting a pair of wheels adjacent the toe plate, a pair of leg members attached to the skid members and forming an acute angle with the longitudinal members, a plurality of rung members transversely bracing the leg members, said leg members including interiorly housed, slidably disposed inner elements terminating at their lower extremities in foot members extending beyond the leg members, and means for controlling the amount of extension of the foot members with respect to the toe plate to establish a support base in conjunction with the toe plate, said support base permitting the use of the hand truck in its substantially vertical position as a mounting device.

2. The two wheel hand truck as claimed in claim 1, said control means including studs attached to the inner elements and extending through slots in the leg members, said slots terminating at one end thereof in arcuate portions to engage the studs in off-set positions, the inner elements having the other ends thereof extending beyond the leg members at the other ends thereof, lever members attached to said other ends of the inner elements for slidably and rotatively moving the inner elements within the leg members, and biasing elements disposed on the inner elements between the lever members and the leg members for maintaining the inner elements and their associated foot members in a withdrawn, non-ladder, position.

3. A combination ladder and hand truck comprising an elongated frame having at one end thereof a toe member and supported thereat by rolling means and handles at the other end thereof to facilitate movement of the hand truck, an extendible ladder structure attached to and forming part of the frame and disposed to adapt, in conjunction with the toe member, the hand truck in its substantially vertical position for ascent purposes, means for actuating the extendible ladder structure to its ladder position and to its non-ladder position, the ladder structure comprising a pair of longitudinal hollow members spatially disposed substantially parallel to each other and angularly with respect to the frame, a pair of inner longitudinal members slidably and rotatively disposed inside the hollow members, said inner members extending beyond the ends of the hollow members, a pair of feet adjustably affixed to the ends of the inner members adjacent the rolling means, said actuating means being normally biased by spring means to maintain the feet in withdrawn, non-ladder, position to permit movement of the hand truck during normal use.

4. A two-wheel hand truck comprising a frame of two tubular members spatially disposed alongside of each other and transversely braced by cross-members, said tubular members having handles affixed thereto near one end thereof and a toe plate affixed thereto at the other ends thereof, a pair of extendible support members individually associated with each tubular member and affixed angularly thereto to form an acute angle therewith, said support members being braced to each other by transverse rung members, and means for effecting extension of the support members with respect to the toe plate to effect in conjunction therewith an upright standing position of the hand truck, said support members comprising outer tubular members slidably housing therein individually movable inner tubular members extending outwardly at both ends of the outer tubular members, the ends of the inner tubular members terminating adjacent the toe plate in foot portions and the other ends terminating in knob members, a catch member for setting the position of the inner member with respect to the outer member in at least two positions, and a spring member for maintaining a biased relationship between the outer and inner tubular members.

5. A two-wheel hand truck as claimed in claim 4, said foot portions having disk-like members with rounded surfaces and individually adjustable with respect to their associated inner members for establishing the initial extension of the extendible support members.

6. A combination ladder and hand truck comprising an elongated frame terminated at one end thereof in handle means and at the other end thereof in a toe plate in adjoining disposition to rolling means, ladder means rigidly affixed to said frame and providing structural support thereto, said ladder means having members extendible substantially to the plane passing through the toe plate to form a ladder base, and further means to additionally extend the members with respect to the toe plate.

7. A combination ladder and hand truck as claimed in claim 6, said ladder means comprising hollow members telescopically housing said extendible members, and said further extendible means comprising a pair of feet adjustably affixed to the extremities of each extensible members.

8. A combination ladder and hand truck as claimed in claim 7, including means for locking said extendible members and said feet.

9. A ladder structure for use with a hand truck frame for converting same for use as a ladder device, said frame having a pair of longitudinal members supporting a pair of skid members, said ladder structure being adapted for mounting between said skid members and comprising a pair of extendible leg members spatially disposed with respect to each other and supporting therebetween a plurality of rung members rigidly affixed to said leg members, means for attaching the leg members to said skid members, means for extending said leg members to form a ladder base in conjunction with one extremity of the frame, and means for adjustably extending the leg members with respect to said extremity of said frame.

10. A ladder structure as claimed in claim 9, including means for locking said leg members in the extended position and means for locking said adjustably extending means.

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