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WHEELED CARRIER

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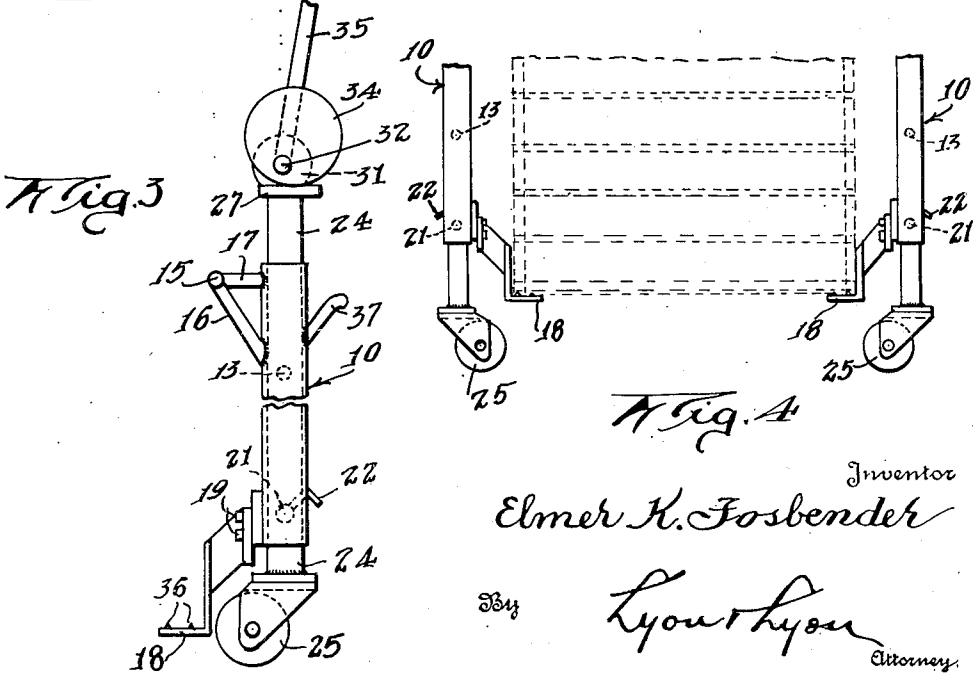
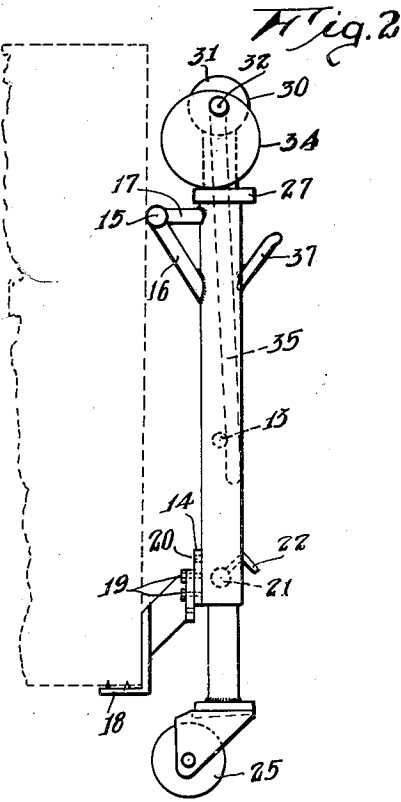
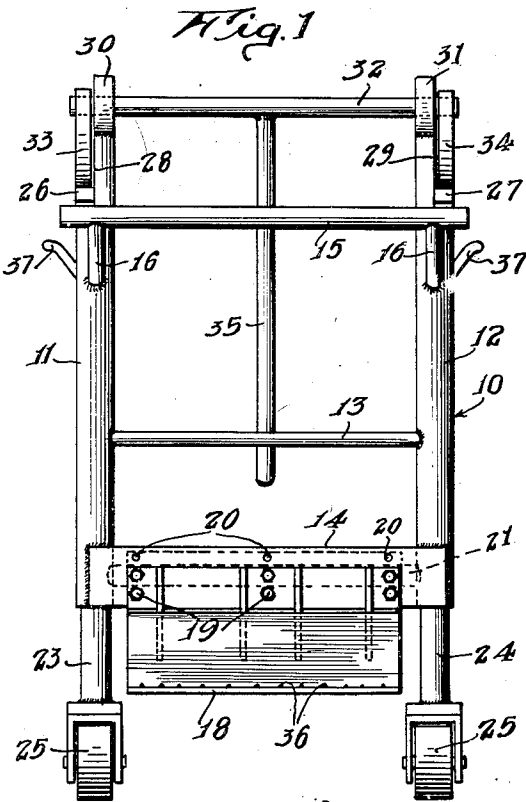


Fig. 4

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WHEELED CARRIER

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7 Claims. (Cl. 280-44)

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This invention relates to a hand truck and is particularly directed toward apparatus for lifting and moving heavy objects such as, for example, refrigerators, pianos, boxed or crated machinery, and so forth. It is particularly directed to a hand truck having relatively movable parts whereby a load carrying frame may be lifted relative to floor contact rollers.

The principal object of this invention is to provide a hand truck or lifting carrier of this type having improved actuating mechanism for lifting the load.

Another object is to provide a device of this type incorporating cam and follower means for raising the load carrying support.

Another object is to provide such a device in which the cam and follower means are automatically self-locking.

Other objects and advantages will appear hereinafter.

In the drawings:

Figure 1 is a front elevation of a hand truck embodying a preferred form of my invention.

Figure 2 is a side elevation thereof.

Figure 3 is a view similar to Figure 2, but partly broken away and illustrating the parts in the different positions.

Figure 4 is a side elevation, partly broken away, showing two hand trucks embodying my invention and cooperating to support a load between them.

Referring to the drawings, a frame generally designated 10 comprises a pair of tubular side elements 11 and 12 mounted in parallel relation and provided with a cross brace 13 and lower support 14. A bumper bar 15 also connects the side elements 11 and 12 together by means of the struts 16 and 17. The side elements 11 and 12, cross brace 13, lower support 14, bumper bar 15 and supporting struts are preferably welded together to form a single integral unit comprising the frame 10. A supporting foot piece 18 is detachably secured to the lower support 14 by means of bolts 19. A plurality of bolt holes 20 may be provided in the lower support 14 or in the foot piece 18, whereby the foot piece may be secured to the lower support at any one of several elevations. A secondary cross brace 21 integrally connects the side elements 11 and 12 adjacent the lower support 14, and attached to this cross brace 21 by any convenient means such as welding is an inverted angle clip 22.

Slidably mounted within the tubular elements 11 and 12 are the posts 23 and 24 which may be of tubular or solid construction and which carry

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swivel mounted rollers 25 at their lower ends. At the upper ends of the posts 23 and 24 are secured stationary blocks or follower elements 26 and 27. The upper ends of the side elements 11 and 12 are cut away at 28 and 29 to provide a slot or clearance in which the follower blocks 26 and 27 may reciprocate. Bearings 30 and 31 secured to the upper ends of the side elements 11 and 12 rotatably support the transverse shaft 32. On opposite ends of the shaft 32 are secured eccentric discs 33 and 34 which act as cam members and which serve in cooperative engagement with the follower blocks 26 and 27 to raise and lower the frame 10 relative to the posts 23 and 24. A manually operable lever 35 is secured to the shaft 32 for rotating the eccentric discs 33 and 34. The lever 35 is arranged to engage the cross brace 13 to limit clockwise movement of the lever, as viewed in Figure 2.

In operation, a pair of hand trucks of the type described are used in cooperation to support a load between them. The lever 35 is raised to an elevated position as shown in Figure 3, thereby allowing the frame 10 and foot piece 18 to gravitate to its lowest position. The foot piece 18 which may be provided with a series of small projections 36 for engaging a wooden packing case is then engaged beneath the load. The lever 35 is then turned clockwise from the position shown in Figure 3 to the position shown in Figure 2, which action serves to rotate the eccentric disc 34 and hence raise the frame 10 and foot piece 18 upwardly with respect to the posts 23 and 24, thereby raising the load. The bumper bar 15 engages the side of the load as shown in Figure 2. The other hand truck is engaged with the other end of the load as shown in Figure 4 in the same manner as that just described. Laterally extending hand grips 37 may be provided on the side elements 11 and 12, if desired, for the purpose of facilitating movement of the hand trucks while loaded. The rollers 25 are preferably of swivel mounted type so that the load may be moved in any desired direction.

The angular relationship of the eccentric disc 34 and the lever 35 is such that the disc 34 causes upper movement of the frame 10 as the lever 34 is turned clockwise from the position shown in Figure 3 to that shown in Figure 2. However, the point of greatest elevation of the frame 10 is reached before the lever 35 strikes the cross brace 13 and therefore the disc passes over center, and the frame moves down slightly before the lever 35 contacts the brace 13. It will be understood that this provides an automatic self-locking fea-

ture so that once the lever 35 is moved to the limit of its travel it is automatically maintained in that position by the load without further attention or effort on the part of the operator. When it is desired to lower the load, the operator moves the lever 35 from the position shown in Figure 2 to the position shown in Figure 3. The mechanical advantage provided by the eccentric disc mounting enables an operator to lift a heavy packing case or other load with the expenditure of minimum effort.

If desired, the platform or blade of a conventional two-wheel hand truck, not shown, may be engaged below the angle clip 22 to raise the rollers 25 from the floor in order to support the load on the other hand truck. Such an operation has been found to be useful in transferring a heavy packing case from a loading dock to the bed of a truck.

Having fully described my invention, it is to be understood that I do not wish to be limited to the details herein set forth, but my invention is of the full scope of the appended claims.

I claim:

1. In a lifting carrier of the class described, the combination of a frame having spaced parallel side elements, posts slidably mounted on the side elements, a roller carried at the lower end of each post, a lifting foot on the frame, the upper ends of the side elements being longitudinally notched to define side-opening recesses, bearings at the extreme upper ends of said side elements, a shaft rotatably mounted in said bearings, cams fixed on the shaft operable in said recesses, follower elements on the posts adapted to be engaged with the cams, and means to turn the shaft.

2. In a lifting carrier of the class described, the combination of a frame having spaced parallel side elements, posts slidably mounted on the side elements, a roller carried at the lower end of each post, a lifting foot on the frame, the upper ends of the side elements being longitudinally notched to define side-opening recesses, bearings at the extreme upper ends of said side elements, a shaft rotatably mounted in said bearings, circular discs fixed eccentrically on the shaft, follower elements on the upper ends of the posts operable in said recesses and adapted to cooperate with the discs, and means to turn said shaft, whereby the discs and follower elements act to raise the frame relative to said posts.

3. In a lifting carrier of the class described, the combination of a frame having spaced tubular side elements, posts slidably mounted within said elements, a roller carried at the lower end of each of said posts, a lifting foot extending forwardly on the frame, means for slidably raising the frame with respect to said posts to pick up a load on said foot, said means including a transverse shaft rotatably mounted on the frame, a pair of cams fixed to the shaft, follower elements on the posts adapted to cooperate with the cams, and bumper means extending forwardly on the upper portion of the frame adapted to provide clearance for operation of the cams with respect to the load.

4. In a lifting carrier of the class described, the combination of a frame having spaced side elements, a cross brace connecting said elements,

posts slidably mounted on said elements, a lifting foot on the frame, means for slidably raising the frame with respect to said posts to pick up a load on said foot, said means including a shaft rotatably mounted on said side elements, cams fixed on the shaft, follower elements on the posts adapted to cooperate with the cams, and a manually operated lever fixed to the shaft, the shape of the cams being such that the frame is first raised and then lowered slightly as the lever is moved from inoperative position toward contact with the said cross brace.

5. In a lifting carrier of the class described, the combination of a frame, posts slidably mounted relative to the frame, a lifting foot on the frame, means for slidably raising the frame with respect to said posts to pick up a load on said foot, said means including a rotatable cam, a manually operated lever adapted to rotate the cam, the shape of the cam and the angular position of the lever with respect thereto acting to permit movement of the cam to an over center position, and means on the frame adapted to contact said lever to maintain the cam in such position.

6. In a lifting carrier of the class described, the combination of a frame, posts slidably mounted relative to the frame, a lifting foot on the frame, means for slidably raising the frame with respect to said posts to pick up a load on said foot, said means including a shaft rotatably mounted on the frame, a cam fixed on the shaft, a manually operated lever fixed on the shaft and adapted to rotate the cam, the shape of the cam and the angular position of the lever with respect thereto acting to permit movement of the cam to an over center position, and means on the frame adapted to contact said lever to maintain the cam in such position.

7. In a lifting carrier of the class described, the combination of a frame, posts slidably mounted relative to the frame, a roller carried at the lower end of each of said posts, a lifting foot on the frame near the rollers, means for slidably raising the frame with respect to said posts to pick up a load on said foot, said means including a shaft rotatably mounted on the frame, discs fixed eccentrically on said shaft, a manually operated lever fixed on the shaft and adapted to rotate the discs, follower elements carried on the posts and cooperating with said discs, the angular relationship of the eccentric discs and the lever being such that the frame is first raised and then lowered slightly as the lever is rotated in one direction, and means on the frame adapted to limit movement of the lever in that direction.

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