



April 10, 1951

A. H. MONTOUR

2,548,806

LOAD LIFTING AND TRANSPORTING APPARATUS

Filed May 3, 1947

4 Sheets-Sheet 2

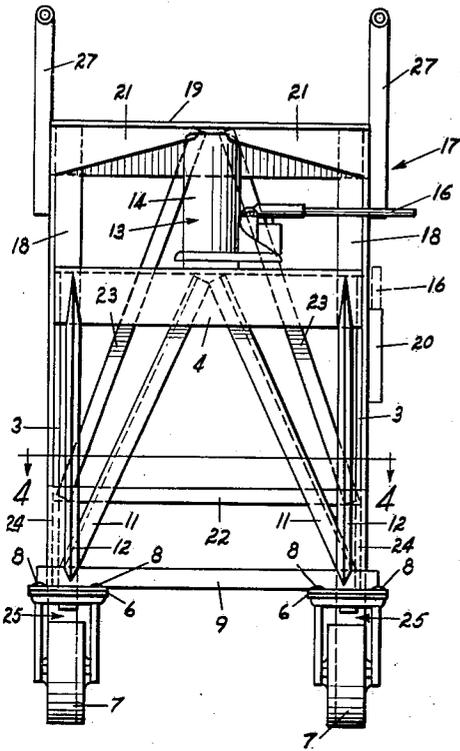


FIG. 2

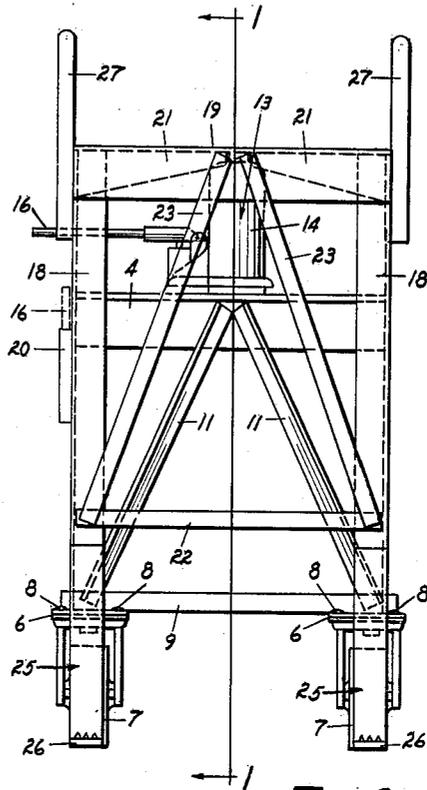


FIG. 3

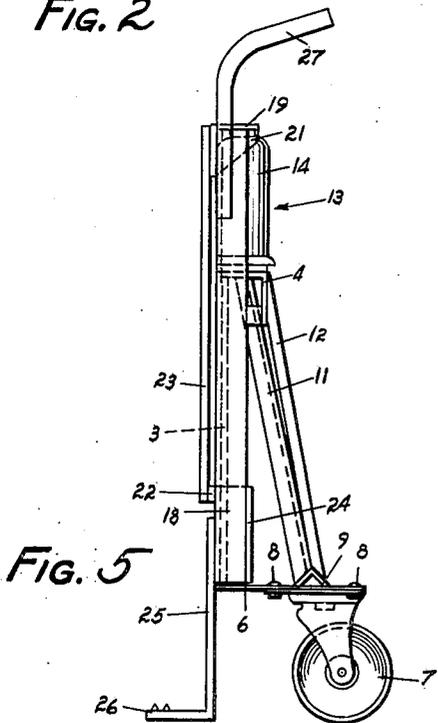


FIG. 5

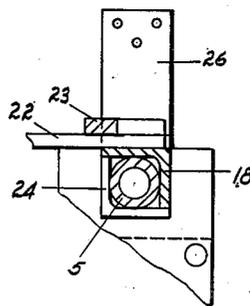


FIG. 6

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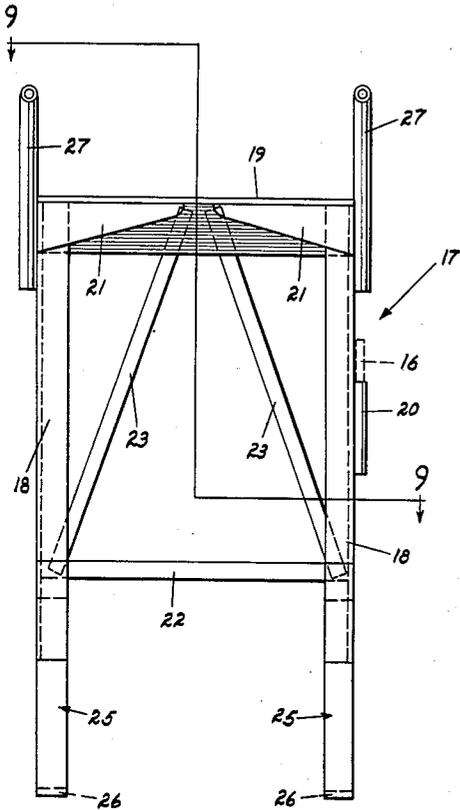


Fig. 7

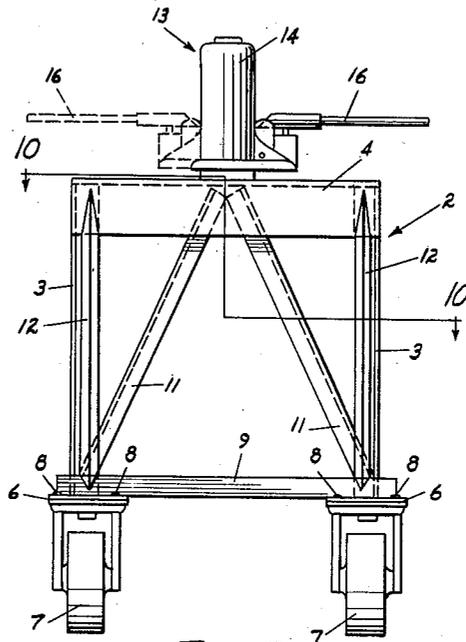


Fig. 8

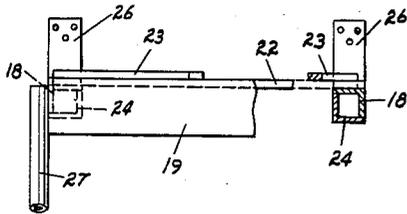


Fig. 9

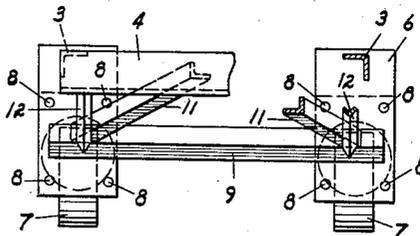


Fig. 10

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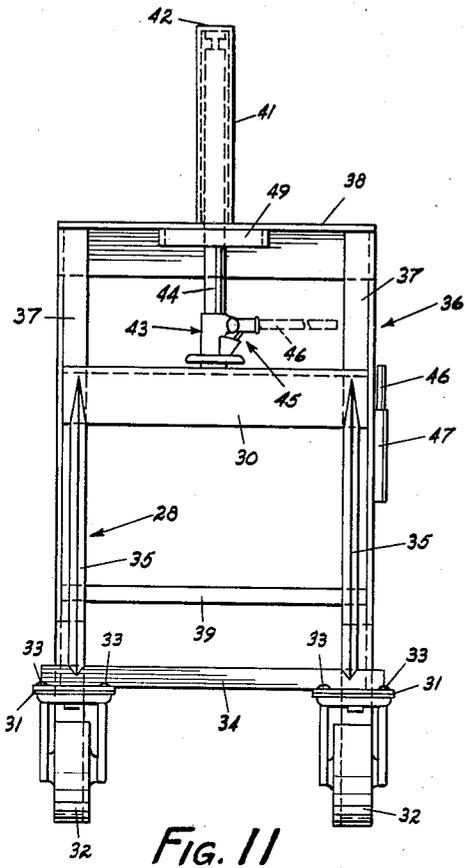


FIG. 11

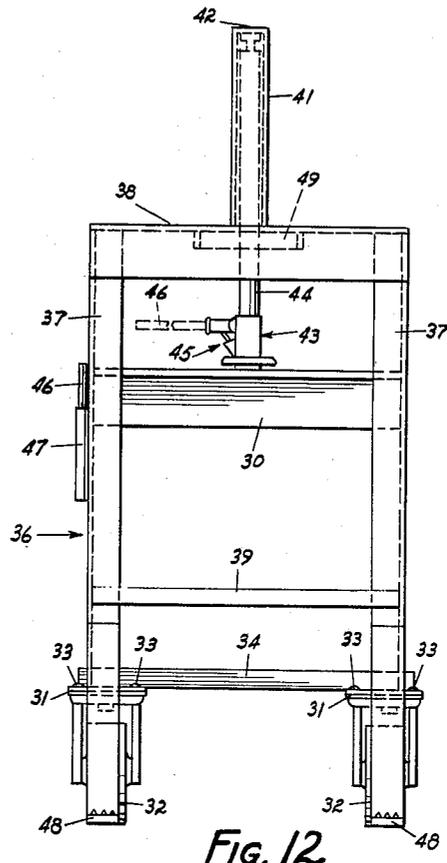


FIG. 12

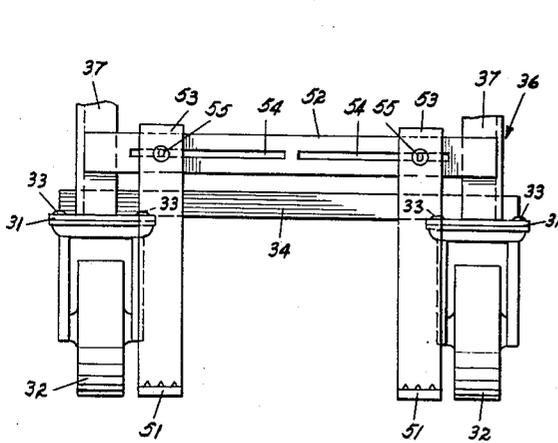


FIG. 14

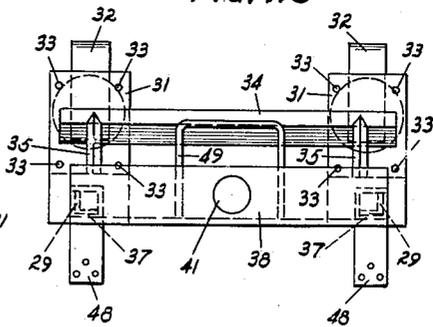


FIG. 13

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# UNITED STATES PATENT OFFICE

2,548,806

## LOAD LIFTING AND TRANSPORTING APPARATUS

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2 Claims. (Cl. 214-65)

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This invention relates to new and useful improvements in lifting apparatus, in general, and more specifically to such an apparatus which is particularly well adapted for use to transport heavy objects which otherwise may be extremely difficult to handle.

Numerous attempts have heretofore been made to provide a lifting apparatus which may conveniently and quickly be positioned in operative position to a load, such as a packing crate and the like, whereby such a load, regardless of its size and weight, may be quickly and readily moved about from one place to another with a minimum of effort, and to the best of my knowledge, apparatus used for this purpose at the present time has not proven entirely satisfactory.

It is therefore highly desirable that an improved apparatus be provided which shall embody all of desirable features of such an apparatus and which is so constructed that it may be quickly moved into or out of operative engagement with a load, such as a large crate or box, or other heavy object, whereby when such a lifting apparatus is engaged with each end of the crate or load, the entire load is lifted off the floor and is supported upon swivel casters, whereby it may easily be transported from one place to another with a minimum of labor and effort. The apparatus has been found to be particularly useful in railway freight houses, factories, shipping rooms, warehouses, and in many other places where heavy objects or articles must be frequently moved about from one place to another, as when loading and unloading freight cars and trucks, or storing or placing heavy machinery.

The inherent construction of the novel lifting apparatus herein disclosed is such that it may readily and quickly be applied to a load without the use of separate securing means. When one such lifting apparatus is applied at each end of a load, such as a large shipping box or other article, such load may be moved about with utmost ease as the large swivel casters make it possible to "roll" the load over rough floors or other surfaces without effort, whereby the operation of handling such heavy merchandise may be greatly expedited and at a reduced cost, and with little danger of damaging the articles while shifting them about.

An object of the present invention therefore is to provide an improved lifting apparatus of the class described comprising a main frame mounted on suitable swivel casters and a secondary frame mounted for vertical sliding movement on the main frame and having forwardly extend-

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ing load engaging elements which normally are positioned adjacent to the floor and cooperate with the casters to support the apparatus in an upright position, and means being provided on the apparatus for vertically translating the secondary frame on the main frame, thereby to bodily lift the load off the floor and transfer its weight onto the casters of the main frame.

A further object is to provide an improved lifting apparatus of the class described made of structural steel and all parts being suitably welded together to provide a very rugged and substantial apparatus, the construction and arrangement of the telescoping frames being such as to provide the utmost in simplicity whereby the apparatus may be manufactured at low cost and with a minimum of labor.

Other objects of the invention reside in the relative disposition of the swivel casters and the load engaging elements whereby such parts cooperate to retain a lifting apparatus in an upright position when not in use; and in the rearward spacing of the swivel casters from the load engaging elements whereby when the apparatus is operatively engaged with a load, the center of gravity of the load will be located forwardly of the swivel casters, whereby the upper portion of the secondary frame will always be held firmly in engagement with the load when the latter is supported on the apparatus.

Other objects of the invention will appear from the following description and the accompanying drawings and will be pointed out in the annexed claims.

In the accompanying drawings there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown, as various changes may be made within the scope of the claims which follow.

In the drawings:

Figure 1 is a vertical sectional view substantially on the line 1-1 of Figure 3 showing the apparatus applied to a load;

Figure 2 is a rear view of the apparatus shown in Figure 1;

Figure 3 is a front view of the apparatus shown in Figure 1;

Figure 4 is a sectional view on the line 4-4 of Figure 2, showing the telescoping arrangement of the laterally spaced side members of the two frames;

Figure 5 is a side view of the apparatus with

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the load engaging elements positioned against the floor;

Figure 6 is a detail sectional view showing a main frame having tubular side frame members;

Figure 7 is a rear view of the secondary frame detached from the main frame;

Figure 8 is a rear view of the main frame with the secondary frame detached therefrom;

Figure 9 is a detail sectional view substantially on the line 9—9 of Figure 7;

Figure 10 is a similar view substantially on the line 10—10 of Figure 8;

Figure 11 is a rear view of a lifting apparatus of slightly modified construction;

Figure 12 is a front view of Figure 11;

Figure 13 is a top view of Figure 11; and

Figure 14 is a view showing a lifting apparatus wherein the load engaging elements are mounted for lateral adjustment on the secondary frame to adapt the apparatus for lifting loads of different sizes.

The novel apparatus herein disclosed is shown comprising a main frame, generally designated by the numeral 2, comprising laterally spaced side members 3 secured together at their upper ends by a suitable cross member 4 which preferably is of angle iron cross section, as illustrated in Figure 1. The side frame members 3 of the main frame are also shown to be of angle iron cross-section, but they may be of tubular stock, as shown at 5 in Figure 6, if desired. The lower ends of the side members 3 of the main frame are shown abuttingly engaged with the forward ends of a pair of metallic base plates 6 to which they are secured by suitable means such as welding.

The plates 6 extend rearwardly from the side frame members 3 to provide supports for a pair of swivel casters 7, shown secured to the rear end portions of the plates 6 by such means as rivets or bolts 8. A cross bar 9, preferably in the form of an angle iron, has its end portions welded to the top faces of the base plates 6, as will be understood by reference to Figures 1 and 4, thereby to secure together said plates to form a rugged structure. Diagonal braces 11 have their lower ends welded to the cross member 9 and their upper ends to the intermediate portion of the upper cross member 4, as clearly illustrated in Figure 8.

Relatively smaller angle iron braces 12 have their lower ends welded to the cross member 9 adjacent to the lower ends of the diagonal braces 11, and their upper ends to the upper cross member 4, as clearly illustrated in Figure 8.

A suitable lifting device, generally designated by the numeral 13, is shown mounted on the upper cross member 4. This lifting device is preferably in the form of a hydraulic jack and comprises a cylinder 14 which is secured to the cross member 4 and a plunger 15 which is slidable in the cylinder and may be projected therefrom, as shown in Figure 1. The lifting device has a suitable operating handle 16, as best shown in Figure 8. The jack 13 is preferably mounted for relative rotation upon the cross member 4 whereby its operating handle 16 may be swung about a vertical axis to any desired position, as indicated by the full and dotted lines in Figure 8.

A secondary frame, generally designated by the numeral 17, is shown comprising laterally spaced side members 18 adapted to telescope with the upright side members 3 of the main frame 2, as will be understood by reference to Figure 4. The upper ends of the side members 18 of the sec-

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ondary frame 17 are secured together by a suitable cross member 19 preferably in the form of an angle iron having its ends suitably welded to the upper ends of the side members 18. Suitable gussets or braces 21 are secured to the upper ends of the side members 18 and the top horizontal flange of the cross member 19, thereby to rigidly secure the upper ends of the frame members 18 to the cross member 19 to provide a very rugged and substantial structure.

The lower ends of the side members 18 are secured together by a cross member 22, preferably in the form of a flat bar, and diagonal braces 23 have their lower ends welded to the opposed ends of the cross member 22 and their upper ends to the front face of the upper cross member 19. The secondary frame 17 has its side members 18 mounted for vertical sliding movement on the side frame members 3 of the main frame, as will be understood by reference to Figures 1 to 4, inclusive. A holder 20 may be secured to one of the side frame members 18 of the secondary frame for supporting the jack handle 16, when not in use, as indicated in dotted lines in Figures 2 and 7.

Relatively shorter angle irons 24 have their edges welded respectively to the edges of the lower portions of the side member 18 of the secondary frame thereby to provide in effect, tubular guides for receiving and guidingly supporting the secondary frame on the main frame, when the secondary frame is vertically translated thereon.

An important feature of the present invention resides in the arrangement of the load engaging elements, generally designated by the numeral 25. The elements 25, as best shown in Figure 5, are preferably constructed of bar stock of ample width and strength to carry the load, and they have their upper end portions suitably welded to the lower end portions of the side members 18 of the secondary frame 17. The lower end portions 26 of the elements 25 extend forwardly as shown in Figure 1, and are normally positioned adjacent to the floor whereby they may readily be inserted under a load, as will be understood by reference to the dotted lines shown in Figure 1. When the elements 26 are in their lowermost positions as shown in Figure 5, they may engage the floor and thereby cooperate with the casters 7 to retain the apparatus in an upright position, as shown in Figure 5. Suitable handles 27 may be secured to the upper ends of the side frame members 18 of the secondary frame 17 to facilitate moving the apparatus about from place to place.

When the two frames are assembled, as shown in Figures 1, 2 and 3, the upper end of the plunger or ram 15 of the hydraulic jack 13 is engaged with the cross member 19 of the secondary frame whereby when the jack handle 16 is manipulated to operate the jack, the secondary frame will be vertically translated on the main frame to bodily lift the load from the floor, as shown in Figure 1.

In Figure 1 it may also be noted the casters 7 are spaced rearwardly a considerable distance from the load engaging elements 25. This is a highly desirable feature of the structure in that when the load is supported on the elements 25, as shown in Figure 1, the upper portion of the secondary frame, including the diagonal braces 23, is held firmly against the load whereby the greater the weight of the load, the more firmly the lifting apparatus is held in operative engagement therewith.

When a lifting apparatus is applied to each

end of a heavy shipping box or crate, as indicated in Figure 1, the shipping box, regardless of its size and weight, may readily be transported about from one place to another, usually by a single workman. By the employment of the lifting apparatus herein disclosed, heavy crates or shipping boxes may be quickly and easily moved about on station platforms or in warehouses, or they may readily be loaded into or out of freight cars in a fraction of the time heretofore required to move such heavy boxes or crates when using conventional equipment such as rollers and pinch bars. The caster rollers employed are very important because they make it possible to shift the load laterally as well as forwardly and rearwardly. When the load has been moved to the desired position, the lifting apparatus may be quickly released therefrom by manipulation of the jack handle 16, as will be understood.

In Figures 11, 12 and 13, there is shown a lifting apparatus of slightly modified construction and which may be found more desirable in structures of this type adapted for handling lighter weight articles. The structures shown in Figures 11 to 13, inclusive, includes a main frame, generally designated by the numeral 28, comprising upright side members 29 tied together at their upper ends by a cross member 30 and having their lower ends secured to plates 31, similar to the plates 6, shown in Figure 4. Suitable swivel casters 32 are secured to the plates 31 by bolts or rivets 33. A cross member 34 secures together the rear intermediate portions of the plates 31 in a manner similar to the cross member 9 of the form shown in Figure 4. Diagonal braces 35 have their lower ends suitably welded to the lower cross members 34 and their upper ends to the plates 31, as will be understood by reference to Figure 11.

A secondary frame, generally designated by the numeral 36, is shown comprising laterally spaced side members 37 which are secured together in spaced relation by a suitable cross member 38 of angle iron cross section. The lower end portions of the frame members 35 are tied together by a cross bar 39. The upright side frame members 37 of the secondary frame 36 are telescopically engaged with the side frame members 29 of the main frame 28, as best illustrated in Figure 13, whereby the secondary frame is adapted for vertical sliding movement on the main frame, as shown and described with reference to Figures 1 to 10, inclusive.

In the form shown in Figures 11 to 13, inclusive, a tubular member 41 is shown mounted upon and secured to the upper cross member of the secondary frame 36 and has its upper end 42 closed as shown.

A conventional jack, generally designated by the numeral 43, preferably of the hydraulic type, is secured to the cross member 30 of the secondary frame, and has a cylinder 44 shown extended upwardly into the tubular member 41. The jack is operatively associated with the tubular member 41, and is provided with a suitable pump 45 having an operating handle 46, whereby the jack may be conveniently operated to vertically translate the secondary frame 36 upon the main frame 28, when it is desired to lift a load from the floor. A suitable holder 47 is shown secured to one of the side frame members of the secondary frame for supporting the jack handle 46, when not in use.

The secondary frame 36 of the apparatus shown in Figures 11, 12 and 13, is provided with

forwardly extending load engaging elements 48, similar to the elements 26 shown in Figure 5, which normally may be positioned to engage the ground whereby they cooperate with the casters 32 to support the apparatus in an upright position upon the floor. In the structures shown in Figures 11 and 12, a suitable handle 49 is shown secured to the upper cross member 38 of the secondary frame 36 which may be conveniently grasped by a workman or operator when moving the apparatus about from one place to another.

In Figure 14, there is shown an apparatus comprising load engaging elements 51 which are mounted for lateral adjustment upon a cross member 52 secured to the lower portion of the secondary frame 36, as will be understood. The load engaging elements 51 are provided at their upper ends with offset portions 53 adapted to seat upon the upper edge of the cross member 52. Elongated slots 54 are provided in the cross member 52 adapted to receive bolts 55 received in suitable apertures provided in the upper ends of the load engaging members 51, as shown. The bolts pass through the elongated apertures 54, and when their nuts are loosened, the members 51 may be laterally adjusted upon the bar 52 to vary the spacing between the members 51 to conform to the size of the load to be lifted. The apparatus shown in Figure 14 otherwise is substantially identical to the one shown in Figures 11 to 13, inclusive, and the remaining parts thereof are therefore identified by like numerals.

The apparatus herein disclosed has been found extremely practical for use in shipping rooms, railroad freight houses, factories, store rooms, in trucks, railroad and marine shipping terminals, and wherever heavy bulky units must be handled and shifted about from one place to another. By the employment of the novel lifting apparatus herein disclosed, one or two men may handle practically any size load with perfect ease and in a minimum of time. The manipulation of the apparatus is extremely simple and the operation of placing it under a load or removing it therefrom may be accomplished by any inexperienced person in a minimum of time. When transporting heavy loads from one place to another, two lifting apparatus are employed. One is applied to each end of the load, as shown in Figure 1, whereby the entire load will be supported upon the casters 7 which are of ample size to permit the load to be readily rolled over relatively rough floors, and the like, without difficulty. Its construction is extremely simple and inexpensive and the all-welded construction provides a very rugged and substantial apparatus of this type which offers the utmost in convenience of operation and long life.

In the drawings I have referred to the means for vertically translating the secondary frame upon the main frame as comprising a hydraulic jack. It is to be understood that any apparatus or device which is applicable for the purpose may be utilized for thus translating the secondary frame upon the main frame without departing from the scope of the invention.

It will be apparent to those skilled in the art that I have accomplished at least the principal objects of my invention, and it will also be apparent to those skilled in the art that the embodiments herein described may be variously changed and modified without departing from the spirit of the invention, and that the invention is capable of uses and has advantages not herein specifically described; hence it will be appreciated

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that the herein disclosed embodiments are illustrative only, and that my invention is not limited thereto.

I claim as my invention:

1. In an apparatus of the class described, a main frame comprising laterally spaced side members, a cross member secured to the upper ends of said side members, rearwardly extending base plates secured to the lower ends of said side members, a cross member secured to the upper faces of said base plates rearwardly of the intermediate portions thereof for retaining said plates in fixed spaced relation, brace members having their lower ends secured to said lower cross member and their upper ends to the upper cross member, swivel casters secured to the rear end portions of said base plates, a secondary frame having spaced side members slidably engaged with the spaced side members of the main frame, a horizontally disposed angle iron tying together the upper ends of the side members of the secondary frame, load engaging elements secured to and depending from the secondary frame and normally positioned adjacent to the floor whereby they may cooperate with the casters to support the apparatus in an upright position when not in use, a suitable lifting jack interposed between the upper cross members of said main and secondary frames for vertically translating the secondary frames on the main frame to lift a load, and suitable carrying handles on the secondary frame to facilitate maneuvering the apparatus into and out of engagement with a load.

2. In an apparatus of the class described, a main frame comprising laterally spaced side members, a cross member secured to the upper ends of said side members, rearwardly extending base plates secured to the lower ends of said side members, a cross member secured to said base plates adjacent the rear end portions thereof for

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retaining said plates in fixed spaced relation, brace members having their lower ends secured to said lower cross member and their upper ends to the upper cross member, casters secured to the rear end portions of said base plates, a secondary frame having spaced side members slidably engaged with the spaced side members of the main frame, a horizontally disposed angle iron securing together the upper ends of the side members of the secondary frame, a cross member secured to the lower portion of the secondary frame above said base plates, load engaging elements adjustably secured to said cross member whereby the spacing between said elements may be varied to accommodate loads of varying shapes and sizes, a lifting jack interposed between the upper cross members of said main and secondary frames for vertically translating the secondary frame on the main frame to lift a load, and suitable carrying handles on the secondary frame to facilitate maneuvering the apparatus into and out of engagement with a load.

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